



Hazus: Flood Global Risk Report

Region Name: JeffersonCo_Flood

Flood Scenario: 100_Year_Flood

Print Date: Monday, March 6, 2023

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

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

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. 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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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):

- Pennsylvania

Note:

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

The geographical size of the region is approximately 626 square miles and contains 3,472 census blocks. The region contains over 19 thousand households and has a total population of 45,200 people (2010 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 22,310 buildings in the region with a total building replacement value (excluding contents) of 4,777 million dollars. Approximately 92.47% of the buildings (and 71.03% of the building value) are associated with residential housing.



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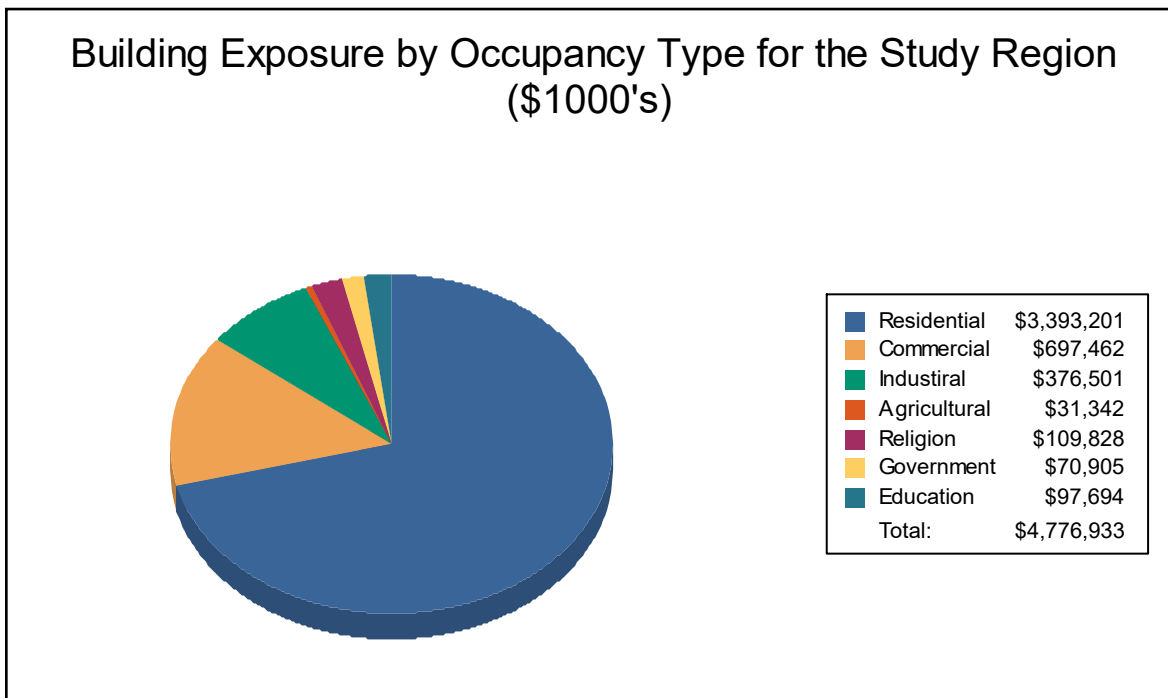
Building Inventory

General Building Stock

Hazus estimates that there are 22,310 buildings in the region which have an aggregate total replacement value of 4,777 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	3,393,201	71.0%
Commercial	697,462	14.6%
Industrial	376,501	7.9%
Agricultural	31,342	0.7%
Religion	109,828	2.3%
Government	70,905	1.5%
Education	97,694	2.0%
Total	4,776,933	100%



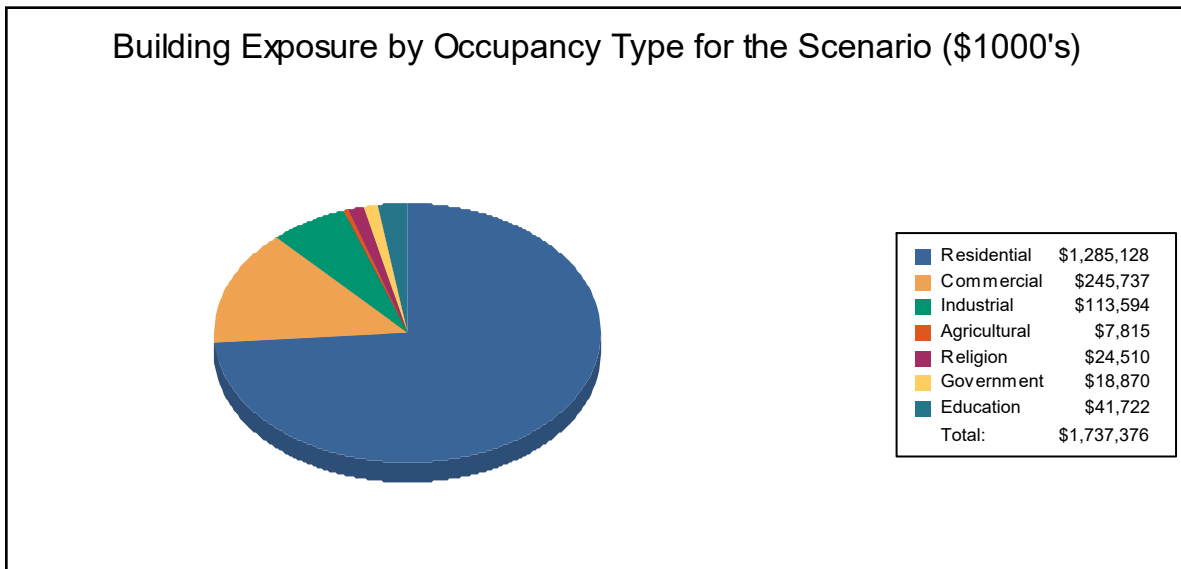
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Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	1,285,128	74.0%
Commercial	245,737	14.1%
Industrial	113,594	6.5%
Agricultural	7,815	0.4%
Religion	24,510	1.4%
Government	18,870	1.1%
Education	41,722	2.4%
Total	1,737,376	100%



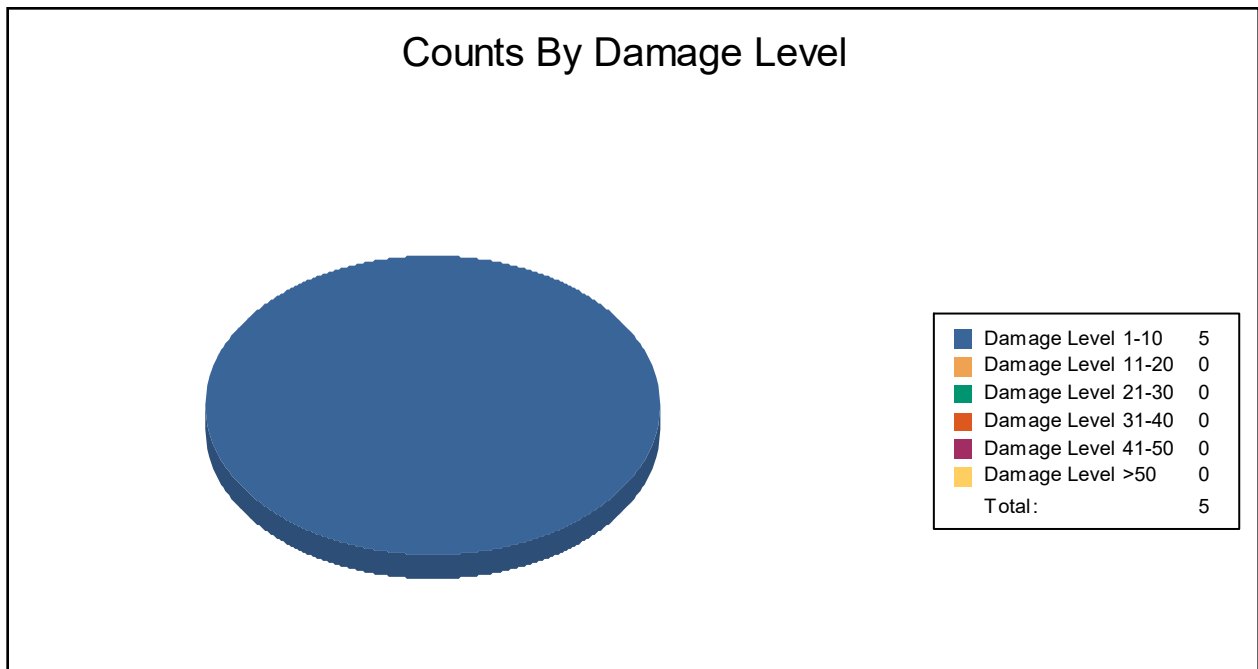
Essential Facility Inventory

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 84 beds. There are 38 schools, 19 fire stations, 9 police stations and 1 emergency operation center.



Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		>50	
	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	100	0	0	0	0	0	0	0	0	0	0
Total	5		0		0		0		0		0	



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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	100	0	0	0	0	0	0	0	0	0	0



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Essential Facility Damage

Before the flood analyzed in this scenario, the region had 84 hospital beds available for use. On the day of the scenario flood event, the model estimates that 84 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	# Facilities			
	Total	At Least Moderate	At Least Substantial	Loss of Use
Emergency Operation Centers	1	0	0	0
Fire Stations	19	0	0	0
Hospitals	2	0	0	0
Police Stations	9	0	0	0
Schools	38	0	0	0

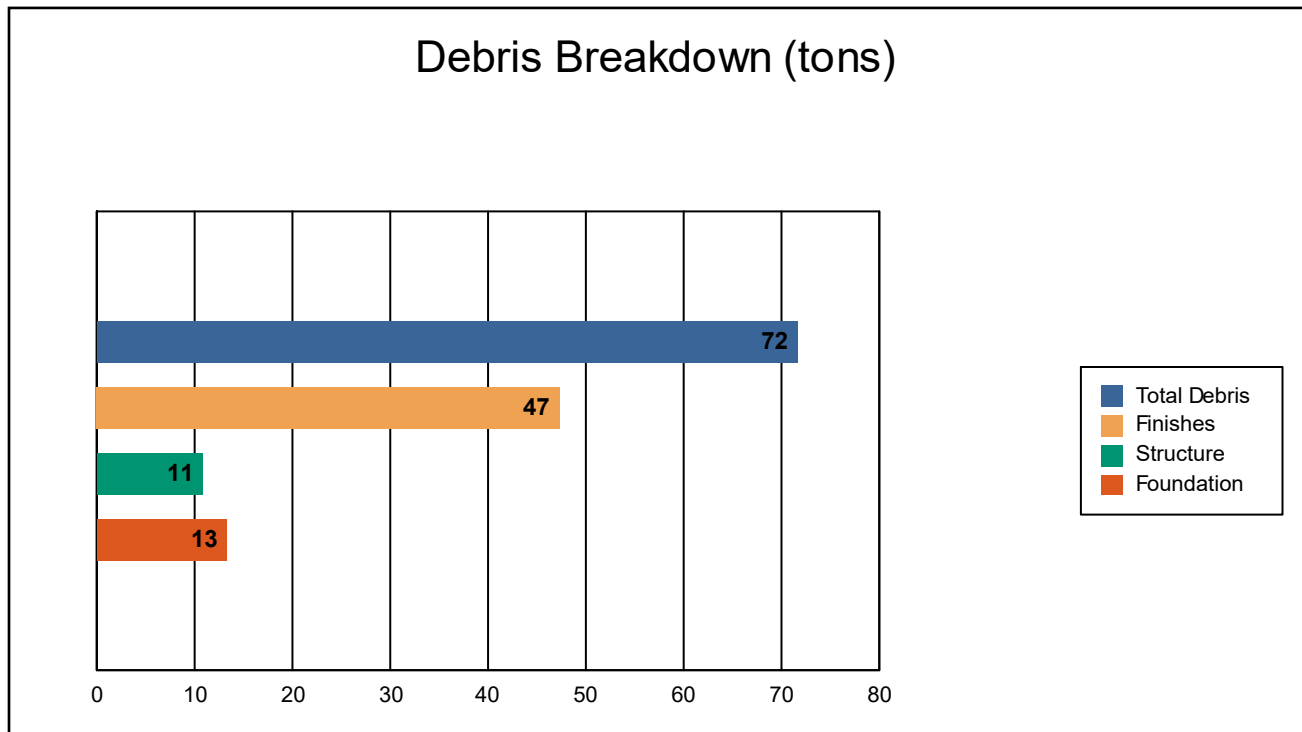
If this report displays all zeros or is blank, two possibilities can explain this.

- (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.



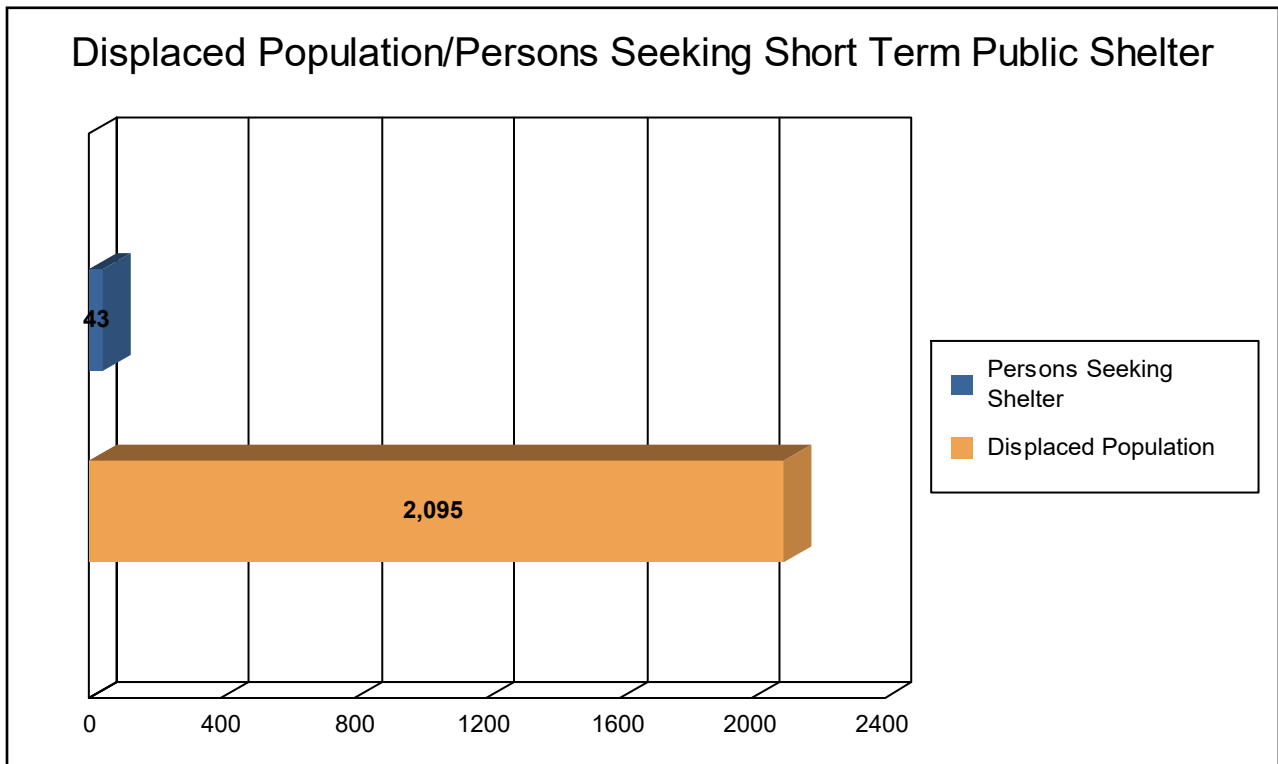
The model estimates that a total of 72 tons of debris will be generated. Of the total amount, Finishes comprises 66% of the total, Structure comprises 15% of the total, and Foundation comprises 19%. If the debris tonnage is converted into an estimated number of truckloads, it will require 3 truckloads (@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 698 households (or 2,095 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 43 people (out of a total population of 45,200) will seek temporary shelter in public shelters.



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Economic Loss

The total economic loss estimated for the flood is 6.70 million dollars, which represents 0.39 % 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 1.72 million dollars. 74% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 22.55% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.



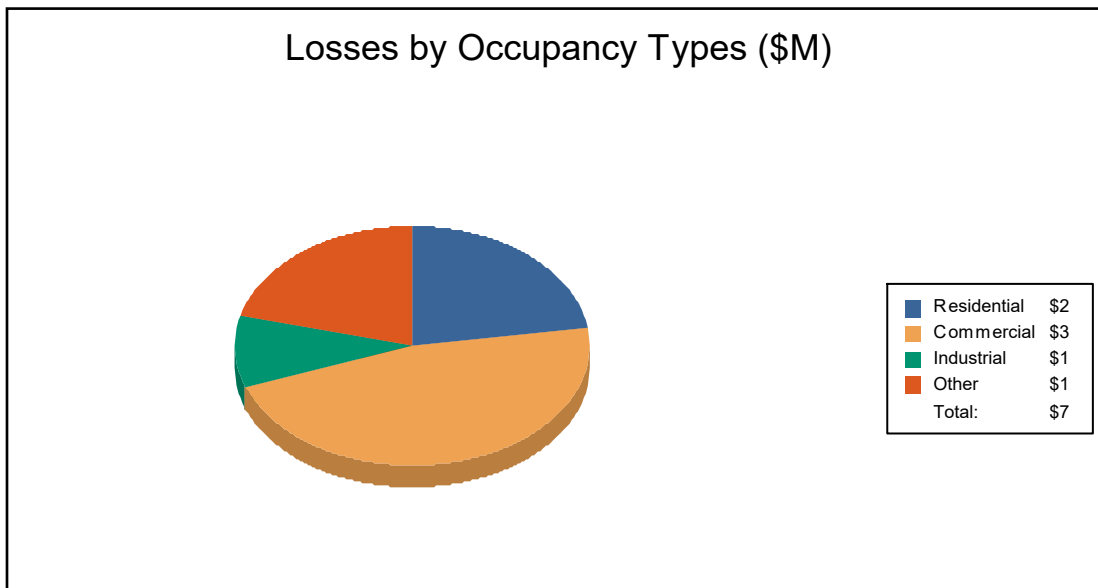
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Table 6: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<u>Building Loss</u>						
	Building	0.47	0.07	0.12	0.01	0.67
	Content	0.18	0.30	0.40	0.09	0.96
	Inventory	0.00	0.00	0.08	0.00	0.08
	Subtotal	0.65	0.37	0.60	0.10	1.72
<u>Business Interruption</u>						
	Income	0.06	1.26	0.02	0.16	1.50
	Relocation	0.50	0.22	0.01	0.09	0.82
	Rental Income	0.15	0.12	0.00	0.02	0.29
	Wage	0.15	1.16	0.02	1.04	2.37
	Subtotal	0.86	2.76	0.05	1.30	4.98
ALL	Total	1.51	3.13	0.65	1.41	6.70



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Appendix A: County Listing for the Region

- Pennsylvania
 - Jefferson



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Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Pennsylvania				
Jefferson	45,200	3,393,201	1,383,732	4,776,933
Total	45,200	3,393,201	1,383,732	4,776,933
Total Study Region	45,200	3,393,201	1,383,732	4,776,933



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