



SOMERSET COUNTY

HAZARD MITIGATION PLAN

SOMERSET COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

DRAFT UPDATED
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Section 5: Risk Assessment Executive Summary

*Prepared by the Somerset County
Mitigation Planning Committee*



EXECUTIVE SUMMARY

According to the Federal Emergency Management Agency (FEMA) Guidance 386-2, “risk assessment” is the process of measuring the potential loss of life, personal injury, economic injury and property damage resulting from natural hazards by assessing the vulnerability of people, buildings and infrastructure to natural hazards.” The risk assessment provides a foundation for the community’s decision makers to evaluate mitigation measures that can help reduce the impacts of a hazard when one occurs.

Regular updates of a plan’s risk assessment ensure that the plan remains applicable to present-day understandings of vulnerabilities based on the most recent studies, reports, event histories, etc. Regular updates also ensure that the plan continues to present the best path forward for reducing future damages when hazard events, inevitably, occur.

This Risk Assessment Interim Deliverable is an interim draft document consisting of a preliminary update to Section 5 of the 2014 Hazard Mitigation Plan. Please be advised that this is being prepared for internal committee member review and planning purposes only, and is not for public release as associated internal reviews are pending. Section 5 will be released to the public in full as part of the Draft Plan Update later this year.

Somerset County’s risk assessment is organized into four sections. Section 5.1 describes the methodology and tools used to support the risk assessment process. Section 5.2 identifies the natural hazards of concern for further profiling and evaluation. In Section 5.3, the identified hazards of concern are ranked for Somerset County as a whole to describe their probability of occurrence and their impact on population, property (general building stock including critical facilities) and the economy. Lastly, Section 5.4 profiles and assesses vulnerability for each hazard of concern.

The risk assessment process used for this Plan is consistent with the process and steps presented in FEMA 386-2, State and Local Mitigation Planning How-to-Guide, Understanding Your Risks – Identifying Hazards and Estimating Losses (FEMA, 2001). This process identifies and profiles the hazards of concern and assesses the vulnerability of assets (population, structures, critical facilities and the economy) at risk in the community. A risk assessment provides a foundation for the community’s decision makers to evaluate mitigation measures that can help reduce the impacts of a hazard when one occurs (Section 9 of this plan).

The risk assessment methodology consists of four key steps:

- Step 1 - Identify hazards of concern
- Step 2 – Profile each hazard
- Step 3 – Determine what is exposed to each hazard
- Step 4 – Evaluate potential impacts and damages/losses

In 1997, FEMA developed a standardized model for estimating losses caused by earthquakes, known as Hazards U.S. or HAZUS. HAZUS was developed in response to the need for more effective national-, state-, and community-level planning and the need to identify areas that face the highest risk and potential for loss. HAZUS was expanded into a multi-hazard methodology, HAZUS-MH with new models for estimating potential losses from wind (hurricanes) and flood

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(riverine and coastal) hazards. HAZUS-MH is a Geographic Information System (GIS)-based software tool that applies engineering and scientific risk calculations, which have been developed by hazard and information technology experts, to provide defensible damage and loss estimates. These methodologies are accepted by FEMA and provide a consistent framework for assessing risk across a variety of hazards. The GIS framework also supports the evaluation of hazards and assessment of inventory and loss estimates for these hazards.

HAZUS-MH uses GIS technology to produce detailed maps and analytical reports that estimate a community’s direct physical damage to building stock, critical facilities, transportation systems and utility systems. To generate this information, HAZUS-MH uses default HAZUS-MH provided data for inventory, vulnerability, and hazards; this default data can be supplemented with local data to provide a more refined analysis. Damage reports can include induced damage (inundation, fire, threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, and economic impact) depending on the hazard and available local data. HAZUS-MH’s open data architecture can be used to manage community GIS data in a central location. The use of this software also promotes consistency of data output now and in the future and standardization of data collection and storage. The guidance Using HAZUS-MH for Risk Assessment: How-to Guide (FEMA 433) was used to support the application of HAZUS-MH for this risk assessment and plan. More information on HAZUS-MH is available at <https://www.fema.gov/hazus/>.

To provide a strong foundation for mitigation strategies considered in Section 6.0, Somerset County considered a full range of natural hazards that could impact the area, and then identified and ranked those hazards that presented the greatest concern. As part of this plan update, hazards were reconsidered in light of new information. After the hazards of concern were identified for Somerset County, the hazards were ranked to describe their probability of occurrence and their impact on population, property (general building stock including critical facilities) and the economy. Each participating borough, township, or special district may have differing degrees of risk exposure and vulnerability compared to the County as a whole; therefore each jurisdiction ranked the degree of risk to each hazard as it pertains to their community using the same methodology as applied to the County-wide ranking. This assured consistency in the overall ranking of risk process. The hazard ranking for the County and each participating district can be found in their jurisdictional annex in Volume II of this plan. No changes were ultimately made to the hazards identified, or to their rank, as part of this update.

**Table ES-1
Summary Results of the Hazard Identification and Evaluation Process**

<ul style="list-style-type: none"> ○ Avalanche ○ Coastal Erosion ⊖ Drought ⊖ Earthquake ○ Expansive Soils ⊖ Extreme Temperatures ⊖ Flood (Riverine, Flash, Ice Jam, and Dam Flooding) ○ Groundwater Contamination ⊖ Hailstorm ⊖ Hurricane (and other Tropical Cyclones) ○ Ice Jams ⊖ Ice Storm 	<ul style="list-style-type: none"> ○ Infestation ○ Land Subsidence ○ Landslide ⊖ Nor’easters ○ Radon ⊖ Severe Storms (Windstorms, Thunderstorms, Hail, Lightning, Tornadoes, and Hurricanes) ⊖ Severe Winter Storms (Heavy Snow, Blizzards, Freezing Rain/Sleet, Nor’easters, Ice Storms) ⊖ Tornado ○ Tsunami ○ Volcano ⊖ Wildfire ⊖ Windstorm
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⊖ = Hazard considered significant enough for further evaluation through Somerset County’s multi-jurisdictional hazard risk assessment.

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Table ES-2 shows the impact evaluation results for each hazard of concern, including impact on property, structures, and the economy on the County level. It is noted that several hazards that have a high impact on the local jurisdictional level, may have a lower impact when analyzed county-wide. Jurisdictional ranking results are presented in each local annex in Section 9 of this plan. The weighting factor results and a total impact for each hazard also are summarized.

Table ES-2 Summary Results of the Hazard Identification and Evaluation Process										
Hazard of Concern	Population			Property			Economy			Total Impact Rating (Population + Property + Economy)
	Impact	Numeric Value	Multiplied by Weighing Factor (3)	Impact	Numeric Value	Multiplied by Weighing Factor (2)	Impact	Numeric Value	Multiplied by Weighing Factor (1)	
Drought	Low	1	1 x 3 = 3	Medium	2	2 x 2 = 4	Low	1	1 x 1 = 1	8
Earthquake	Low	1	1 x 3 = 3	Low	1	1 x 2 = 2	Low	1	1 x 1 = 1	6
Extreme Temperature	Low	1	1 x 3 = 3	Low	1	1 x 2 = 2	Low	1	1 x 1 = 1	6
Flooding (riverine, flash, dam-break, ice jam)	Medium	2	2 x 3 = 6	Medium	2	2 x 2 = 4	Low	1	1 x 1 = 1	11
Severe Storms	Medium	2	2 x 3 = 6	High	3	3 x 2 = 6	Low	1	1 x 1 = 1	13
Severe Winter Storms	Medium	2	2 x 3 = 6	Low	1	1 x 2 = 2	Low	1	1 x 1 = 1	9
Wildfire	High	3	3 x 3 = 9	Medium	2	2 x 2 = 4	Low	1	1 x 1 = 1	14

As part of this risk assessment update, hazard profiles were updated. This included any necessary revisions regard hazard descriptions, location, extent historic occurrences, future occurrences, and impacts. Revisions were made as necessary to reflect more recent studies and reports (for example, where agencies have updated hazard area mapping). This risk assessment update also includes loss estimates for flood, hurricane wind, and earthquake hazards using the most recent version of FEMA’s HAZUS model, HAZUS-MH 4.0 (2017). FEMA makes regular improvements and updates to its HAZUS software. The last version of the plan used HAZUS-MH 2.1 (2012). There have been six model updates since 2012 (versions 2.2, 2.2 (SP01), 3.0, 3.1, 3.2, and the current version 4.0). The current version reflects FEMA’s best methodologies and data for estimating damages and losses.

Some key differences between HAZUS-MH 2.1 and HAZUS-MH 4.0 are:

- HAZUS-MH 2.1 (last version of the plan)
 - Census 2000
 - RS Means 2002 for replacement values
 - The damage calculations did not take into account areas where structures were not present.
 - Model defect in some areas - did not calculate damages

- HAZUS-MH 4.0 (2017)
 - Census 2010
 - RS Means 2014 for replacement values
 - The damage calculations take into account areas where structures are not present.
 - Model defect is now corrected to encompass all areas.

Using the new HAZUS-MH 4.0 software, damage estimates are more accurate. Loss estimates for some hazards are observed to be higher than they were calculated to be in the 2014 HMP, while others are observed to be lower. However, no results are of a magnitude to alter the decision drivers or hazard mitigation priorities from the last version of the plan.

