



FEMA



# So You Want to Use Hazus-MH

Hazus-MH is FEMA’s risk assessment and loss estimation tool which helps states, communities, and businesses prepare for, mitigate the effects of, respond to, and recover from a hazard event. Hazus-MH can provide estimates of hazard-related damage before, during or after a disaster occurs. Multiple facets of emergency management can benefit from using Hazus-MH including mitigation, preparedness and response and map-based disaster exercise planning.

Potential loss estimates analyzed by Hazus-MH include:

- Physical damage to residential and commercial buildings, schools, critical facilities, and infrastructure;
- Economic loss, including lost jobs, business interruptions, repair and reconstruction costs; and
- Social impacts, including estimates of shelter requirements, displaced households, and population exposed.



## Hazus-MH Helps Build Safer and Stronger Communities

Hazus-MH can help states and communities:

- Identify areas at risk from hazards that may require special land use or building codes
- Assess the vulnerability of housing and essential facilities
- Prioritize mitigation projects
- Educate communities about their risk and how to reduce it
- Develop mitigation, preparedness, response and recovery, and map-based disaster plans

### Level 1 Hazus-MH Scenarios Provide Useful Analyses

A unique feature of Hazus-MH is the inventory of data that comes with the software, which consists of hazard data, boundary map data and thirty national datasets of building stock, lifelines and the population. A Hazus-MH “Level 1” analysis simply refers to using these data provided with Hazus-MH “out of the box”, along with basic hazard and loss calculation related inputs, to provide reports and maps.

While Hazus-MH results will always be improved by using local data and knowledge wherever possible, using Hazus-MH out of the box can still help satisfy many of your GIS and data-use needs. Level 1 analyses are most useful for regional or statewide loss estimates. For detailed planning at the municipal or county level, planners are encouraged to update the Hazus-MH model inputs, such as building inventory and hazard data, with their own data, which will significantly improve the accuracy of analyses in most cases.

### Hazus-MH Inventory Consists of Two Types of Data

Aggregated Data:

- General building stock (building distribution in a community based on usage and construction materials and aggregated by sq. footage, valuation and count)
- Demographic data (age, income, sex, household, etc.)
- Agricultural data (statistics associated with crop valuation and production)
- Vehicle data (valuations and counts of vehicles)

Site-Specific Data are Point and Line Locations of the Following:

- Essential facilities (police stations, fire stations, emergency operations centers, schools, and medical facilities)
- Lifelines (utilities and transportation)
- High potential loss facilities (hazardous material facilities, dams, and nuclear plants)

# RiskMAP

Increasing Resilience Together

## Update Your Pre-Disaster Mitigation Plan with Hazus-MH

A mitigation plan is the foundation for a community's longterm strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. All communities need a hazard mitigation plan. Even a small neighborhood flood can overwhelm your community. Being ready will aid in recovery after a natural disaster. State, Tribal, and local governments are required to develop a hazard mitigation plan as a condition for receiving certain types of disaster assistance, including funding for mitigation projects.

### *Wisconsin Analyzes Statewide Flood Risk*

The Wisconsin Emergency Management (WEM) Department of Military Affairs uses Hazus-MH to analyze flood risk throughout the State of Wisconsin. Recognizing the value of Hazus-MH, the WEM has sent several planners to FEMA's Emergency Management Institute (EMI) in Emmitsburg, Maryland for Hazus-MH training. WEM is invested in Hazus-MH modeling and they are working with Hazus-MH software developers to identify ways to incorporate Hazus-MH into both the local and state planning processes. Other states throughout the country have developed statewide Hazus-MH flood analyses for mitigation purposes including Indiana, Pennsylvania, Maryland and Utah.



*Florida Governor Charlie Crist working closely with emergency management officials after a disaster*



calculates commodities such as Points of Distribution (PODs), ice (bags), water (bottles), tarps (for temporary roof repair), meals ready to eat (MREs), personnel (for disbursement of supplies), and gallons of fuel needed to supply transportation modes used by people evacuating due to a hurricane. The spreadsheet designed by Mr. Pavon is flexible, user friendly and publicly available.

### *Hazus-MH and Map-Based Disaster Exercises*

A disaster exercise provides emergency managers with an objective assessment of their capacity to prepare for, respond to and recover from a disaster. A key to a successful exercise is the ability to quantify and map the potential consequences from disasters, including scope of damages, exposed population, and loss of functionality to essential facilities. As a regional loss estimation tool, Hazus-MH is uniquely suited for disaster exercise scenario development. For this reason, Hazus-MH has been widely used since the early 1990s for functional planning, scenario development and exercise support.

### *Hazus-MH Used to Create Hurricane "Alanzo" and Test South Carolina Preparedness*

Hazus-MH was used for a hurricane exercise in January 2008 at FEMA's EMI. The FEMA Region IV Hazus Technical Team produced a complete set of Hazus-MH maps and reports for this exercise. The four-day, scenario-driven exercise was based on a hurricane named "Alanzo" which made landfall in Horry County, South Carolina.

Hazus-MH enabled the exercise participants to evaluate post-landfall flooding levels and peak wind speeds. The Hazus-MH peak gust wind speeds map was especially beneficial: it showed how the wind field greatly exceeded safe building design over broadly populated areas. Hazus-MH made it clear that building to minimum code designs would not safely withstand the wind speeds estimated during this exercise. In addition, the Hazus-MH maps showed degrees of structural damage to schools. This information allowed exercise participants to determine which schools to designate as shelters and which schools needed retrofitting.

### *Hazus-MH Calculates Debris and Commodity Needs for Hurricanes*

Miguel Pavon, a modeler with the Texas Natural Resources Information Service created a spreadsheet that uses Hazus-MH data to determine debris amounts and commodity needs following a hurricane. By using Hazus-MH, the State of Texas can calculate hands-on disaster response and recovery information, such as the numbers of trucks needed to remove debris. The spreadsheet methodology combines Hazus-MH data with a U.S. Army Corps of Engineers program that

**RiskMAP**  
Increasing Resilience Together