HAZUS-MH - Lessons Learned and Moving Forward in Florida

Full Mitigation Best Practice Story

State-wide, Florida

The State of Florida – HAZUS-MH is used by many states. Only Florida, however, is the leader in the use of HAZUS-MH.

During the 2005 hurricane season, the following HAZUS-MH outputs were used in State Emergency Response Team (SERT) briefings following each National Hurricane Center advisory:

• Maximum Sustained Winds, which shows the latest storm track and maximum sustained winds (by census tract).

• Displaced Households and Short-Term Shelter Requirements, which estimates number of households displaced due to damage to residence or loss of utilities, and number of households that require short-term, emergency shelter.

• Hospitals – Potential Loss of Functionality, which identifies hospitals in the area of impact and their potential loss of use, expressed in intervals of < 3 days, 3 – 7 days, > 7 days.

• Nursing Home Wind Exposure, which shows the location of hospitals; wind speeds; and storm track.

• Estimated Concrete and Steel Debris, which uses dot density map to show concrete and steel debris concentrations; wind intensity; and storm track.

• Mobile Home Exposure, which shows distribution of mobile home parks; peak gust winds, and storm track.

• Essential Facilities at Risk, which shows the location of police, fire, schools, emergency operations centers, and hospitals; peak gust winds; and storm surge (from SLOSH model).

Florida and FEMA are well positioned to build on lessons-learned from the 2005-2006 hurricane season to further develop and test the use of HAZUS-MH to support disaster operations. This initiative should address at least two questions:

1. What HAZUS-MH analysis should be incorporated into revised HAZUS-MH standard operating procedures for disaster operations?

This is a key question, and has two interrelated parts: 1) Which “essential elements of information” (e.g., spatial boundaries of damages) are most critical to emergency managers; and 2) Which HAZUS-MH outputs are most reliable, based on findings from the recently completed HAZUS-MH Hurricane Wind Model Validation Study – Florida.

The following HAZUS-MH map-based templates have been developed to support rapid needs assessments: area of projected damage; population at risk; expected damage to essential facilities; expected shelter requirements; expected residential damage; debris generated; and mitigation operations.

A new initiative – led by FEMA, Florida DEM and the Florida HAZUS User Group (FLHUG) – should re-examine HAZUS-MH analysis to identify additional map-based templates that can be used in the 2008 hurricane season – for rapid needs assessment, response and recovery planning, and mitigation operations. The goal is to identify additional HAZUS-MH outputs that can be readily used by FEMA, Florida DEM and local governments to make decisions before, during and after hurricane landfall.

2. What steps need to be taken to fully integrate HAZUS-MH into disaster operations?

Once Florida DEM and FEMA have identified and prioritized HAZUS-MH templates for use in disaster operations, the next step is to develop the planning and technical capacity to fully integrate HAZUS-MH into disaster operations.

Based on lessons learned from previous disaster operations using HAZUS-MH, it is recommended that a new strategy and action plan be based on the following steps:

• Provide executive briefing on use (and limitations) of HAZUS-MH for rapid needs assessment and response.

• Conduct a needs assessment involving key State and local agencies to identify information requirements – including rapid needs assessments – that can be met using HAZUS-MH.

• Incorporate HAZUS-MH into State and local Comprehensive Emergency Management Plans, including Emergency Support Function 5 (Planning and Information).

• Train key State and local emergency management staff in the use of HAZUS-MH analysis for rapid needs assessments and response.

• Use HAZUS-MH in exercises, including scenario development.

For the FLHUG, Collier County has taken the lead in promoting the integration of HAZUS-MH analysis into operations planning. Rick Zyvoloski, Collier County Emergency Management and Chad Bowers, Bold Planning Solutions, have collaborated in the use of HAZUS-MH for local emergency management planning.

For example, Escambia County Emergency Management has done perhaps the best job in Florida of fully incorporating HAZUS-MH into the Comprehensive Emergency Management Plan (CEMP) and specifically Emergency Support Function 5 (ESF 5).

The purpose of ESF 5 is to: 1) collect, analyze, and disseminate tactical information on the nature, scope and potential impacts of an incident or major disaster; 2) use this intelligence to support the Command Group, Logistics, and Operations in their impact assessment and response missions; and 3) identify and anticipate future needs and resource requirements, and incorporate this analysis into Incident Action Plans.

The Escambia County CEMP shows how ESF 5 generated information and analyses can be used in three phases of disaster operations: pre-landfall (predicted impacts of hurricanes); post-landfall immediate response; and sustained response/immediate recovery phase. A matrix is contained in Appendix A of the CEMP that identifies specific HAZUS-MH outputs that can be used to support decision making for each Emergency Support Function (e.g., Transportation, Mass Care, Medical and Health, Mitigation and Community Recovery).

In 2007, HAZUS-MH has been used for Florida Catastrophic Hurricane Initiative, a FEMA sponsored project to increase readiness for major or catastrophic hurricanes in the southern part of Florida.

As a regional loss estimation tool, HAZUS-MH is well suited for modeling potential impacts of scenario South Florida hurricane events on population, essential facilities, high potential loss (HPL) facilities, and transportation and utility lifelines.

One of the products from this initiative is shown below: Design Level Exceedance – Peak Gust Wind Speeds from Hurricane Ono (by Census Tract). This map shows areas where the 3-second wind gusts from hypothetical Hurricane Ono exceeded the American Society of Civil Engineers (ASCE7) building design levels. These levels are displayed by the census tract and are intended areas likely to suffer damage due to design level exceedance.

HAZUS-MH has been increasingly used to support Long-Term Community Recovery and Mitigation (ESF 14). Under the National Response Plan (NRP), ESF 14 provides a coordination mechanism for the Federal government to assess the consequences of major disasters and to coordinate the long-term recovery. Special emphasis is being given to ESF 14 in the Florida Catastrophic Planning Initiative, and the use of HAZUS-MH to carry out analyses.

The state of Florida continues to make progress in adapting HAZUS-MH to support disaster preparedness and response operations. This is due to the following: strong support from FEMA Region IV and FEMA Headquarters; leadership and coordination from the Florida DEM; and the active involvement and technical support from the FLHUG. The HAZUS-MH generated products that emerge from the Florida

Catastrophic Planning Initiative will add considerable value to these efforts.

Florida is among a growing list of states that is using HAZUS-MH for mitigation and long-term recovery planning. In many ways, Florida is far ahead of other states in developing and maintaining a comprehensive inventory of critical facilities, general building stock and high potential loss facilities, which is key to estimating potential exposure and loss from damaging floods, tornadoes, hurricanes and other hazards.

A unique feature of HAZUS-MH is the ability to simulate changes in building practices through mitigation, and then estimate the savings or losses avoided as a result of these mitigation measures. The Hurricane model, for example, enables the user to adopt the a number mitigation measures, either individually or in combination, such as roof covering, secondary water resistance, roof sheathing attachment (e.g., re-nailing with stronger fastners or tighter spacing), and opening protection (e.g., installing impact resistant materials on windows, doors, garages, skylights). Then the user can estimate the losses avoided from scenario events.

Likewise, the Flood model can be used to estimate potential losses avoided as the result of the implementation of mitigation measures, including: identification of areas at risk to flooding; acquisition and relocation or demolition of buildings in floodplain; elevation of structures in the floodplain; and land use planning.

The FLHUG can be the catalyst in new initiatives involving the use of HAZUS-MH for mitigation and long-term recovery planning. The Florida Enhanced Hazard Mitigation Plan (June, 2007) provides a framework for linking pre-and post-disaster mitigation planning in Florida, and can serve as an “overarching” guide and reference for integrating HAZUS-MH into the planning process in Florida. An excellent reference (training course) is Using HAZUS-MH for Risk Assessment (FEMA 433).

The FLHUG led initiative to promote the use of HAZUS-MH for mitigation and long-term recovery planning might include the following tasks:

• Identification of individual state and local plans in Florida that use HAZUS-MH for mitigation and long-term recovery (Local Mitigation Strategy, Comprehensive Plans).

• Use of exemplary Florida plans in the preparation of “how to” guidance (job aids) for state and local planners in Florida on the use of HAZUS-MH analysis for mitigation and long-term recovery planning.

• Implement a pilot project on Using HAZUS-MH for Mitigation and Long-Term Recovery that is guided by two goals: 1) demonstration of use of HAZUS-MH to support local and regional plans (including Comprehensive Plan, Local Mitigation Strategy); and 2) “how to” guidance on practical steps to integrating HAZUS-MH into local and regional planning process. Hillsborough County is an excellent candidate for a pilot project, led by Chris Zambito, who gave a presentation at the National HAZUS Conference in June, 2007.

It is anticipated the state of Florida will continue to make significant progress in 2008 in the use of HAZUS-MH for assessment, mitigation, response and recovery planning, at the state and local level. The FLHUG brings together leadership, direction, and a strong core group of GIS professionals from 1 across the state.

Equally important, Florida continues to enjoy the strong support from the Florida DEM and FEMA Region IV, which is critical to the success of a coordinated, statewide program.

Activity/Project Location

Geographical Area:	**State-wide**
FEMA Region:	**Region IV**
State:	**Florida**

Key Activity/Project Information

Sector:	**Public/Private Partnership**
Hazard Type:	**Severe Storm; Flooding; Hurricane/Tropical Storm; Coastal Storm**
Activity/Project Type:	**HAZUS-MH**
Activity/Project Start Date:	**08/2004**
Activity/Project End Date:	**Ongoing**
Funding Source:	**State sources**

Activity/Project Economic Analysis

Cost:	**Amount Not Available**

Activity/Project Disaster Information

Mitigation Resulted From Federal Disaster?	**No**
Value Tested By Disaster?	**Unknown**
Repetitive Loss Property?	**Unknown**

Reference URLs

Reference URL 1:	**http://flhug.hazus.org/**
Reference URL 2:	**http://www.fema.gov/library/viewRecord.do?id=3087**

Main Points

- During the 2005 hurricane season, HAZUS-MH outputs were used in State Emergency Response Team (SERT) briefings following each National Hurricane Center advisory.
- Florida and FEMA are well positioned to build on lessons-learned from the 2005-2006 hurricane season to further develop and test the use of HAZUS-MH to support disaster operations.
- A new initiative – led by FEMA, Florida DEM and the Florida HAZUS User Group (FLHUG) – should re-examine HAZUS-MH analysis to identify additional map-based templates that can be used in the 2008 hurricane season – for rapid needs assessment, response and recovery planning, and mitigation operations.
- Once Florida DEM and FEMA have identified and prioritized HAZUS-MH templates for use in disaster operations, the next step is to develop the planning and technical capacity to fully integrate HAZUS-MH into disaster operations.
- In 2007, HAZUS-MH has been used for Florida Catastrophic Hurricane Initiative, a FEMA sponsored project to increase readiness for major or catastrophic hurricanes in the southern part of Florida.
- The state of Florida continues to make progress in adapting HAZUS-MH to support disaster preparedness and response operations.