

## Harris County, Texas Uses Hazus-Multi Hazard for Risk Assessment & Hurricane Preparedness

Harris County, Texas is the latest in a growing number of urban counties that has used Hazus-Multi Hazard (Hazus-MH) for risk assessment and preparedness planning. In 2005, the county enlisted the support of CivilTech Engineering, a FEMA authorized Hazus vendor for flood and hurricane models, to assess the risk to flood and hurricane hazards.

Harris County has a population approaching four million, encompasses 1,746 square miles, and is frequently subjected to damaging winds and flooding. Harris County was in a unique position to initiate a Risk Assessment Program using Hazus-MH in 2005. The Tropical Storm Alison Recovery Project (TSARP) provided up-to-date hydrologic and hydraulic data and new mapping tools. In addition, the County's unique relationship with the U.S. Army Corps of Engineers provided extensive economic and risk assessment data from multiple completed and ongoing federal flood reduction projects.

In summary, the County already paid for extensive data collection and data generation for other projects which it now was able to applying to Hazus-MH to a Risk Assessment Program. CivilTech worked with the County to develop a Phase 1 project that would test the capabilities of Hazus-MH.

In Phase of the Harris County Risk Assessment Project, a basic Hazus-MH Level 1 analysis using the Hurricane Wind and Flood modules was run for the entire county to familiarize personnel with the program and provide a useful product that could be immediately used. This was among the largest applications to date of the Hazus-MH program. In order to evaluate the program for a Level 2 analysis, a pilot watershed was selected and Hazus-MH was populated with high-quality data specific to the watershed.

### Use of Hazus-MH to Support Preparedness for Hurricane Rita

On September 21, 2005, the Harris County Office of Emergency Management (OEM) tasked CivilTech to provide technical support in estimating potential losses from Hurricane Rita, using Hazus-MH.

The hurricane approached on an erratic path, first threatening landfall far to the west, then changing course so that its track was closer to Harris County. Local government officials, who were still assisting neighboring states and evacuees with the recovery from Hurricane Katrina, activated emergency preparedness protocols. By Wednesday, September 21, 2005, predictions placed Galveston and Houston directly in the path of the hurricane.

The counties and cities along the Gulf Coast issued evacuation warnings and thousands of residents clogged major freeways and evacuation routes in an effort to travel to the north and west. Traffic impacts in Harris County from both evacuees moving north from the coast and from county residents leaving their homes were extraordinarily severe for several days preceding landfall of the hurricane. Although Hurricane Rita moved to the east and primarily impacted counties and parishes in eastern Texas and western Louisiana as a Category 4 hurricane, shortages of gasoline and other supplies in



Harris County aggravated the transportation problems and made a rapid recovery of the evacuation event difficult.

Harris County was spared a direct hit from Hurricane Rita and sustained only minor wind damage and power outages (in addition to the transportation issues resulting from the evacuation). The storm did, however, give county personnel the opportunity to test their hurricane preparedness protocols and to evaluate planning and implementation of emergency response activities. CivilTech assisted the Harris County Office of Emergency Management (OEM) in applying Hazus-MH predictive tools to the event.

Several conclusions can be drawn from the analyses performed during the Harris County Risk Assessment Program, including:

- The Hazus-MH software package can be successfully applied to a large urban county.
- A Level 2 analysis using local data to supplement the default national data does improve the results of the analysis.
- Near real-time reporting of hurricane events is possible with the Hazus-MH hurricane module by using NWS advisory bulletins.
- Hazus-MH provided much greater detail regarding wind speed distribution throughout the County than was available through the normal news and information services.

This success story for the "Harris County, Texas Uses Hazus-MH for Risk Assessment and Hurricane Preparedness" is also available as a one-page handout in alternative formats.

Hazus: <http://www.fema.gov/HAZUS>

Tropical Storm Alison Recovery Project: <http://www.hcfcd.org/tsarp.asp?flash=yes>

Harris County Office of Emergency Management: <http://www.hcoem.org/>