

FEMA would like to introduce HAZUS to colleges and universities as an effective tool for hazard mitigation planning. This summary was prepared by FEMA for the September 10, 2002 SCUP audioconference—Disaster Mitigation Planning: Outstanding Higher Education and Community Collaborations.

THE HAZUS LOSS ESTIMATION SOFTWARE PROGRAM AND ITS VALUE TO COLLEGES AND UNIVERSITIES

Introduction

Universities are a major resource to communities, states, and the Nation. Colleges and universities and their assets, such as human resources, research facilities, libraries, and infrastructure, are as vulnerable to natural and manmade disasters as any community. Many university campuses have been disrupted by natural hazard events, library collections flooded, roofs lost during hurricanes, buildings damaged by earthquakes so that they could not be occupied, years of research lost, and the education of students disrupted. Recent examples are the floods that caused severe damage to the library at the University of Colorado at Fort Collins and to the animal research facility at the Texas Medical Center. Disaster losses such as these, in addition to having devastating effects on the university and surrounding communities, can have national and international consequences, such as when irreplaceable research data are lost. For these reasons, universities need to assess their own vulnerabilities and address the risks through planning, facility management, and other activities aimed at reducing vulnerability and avoiding disaster losses. HAZUS-MH, the Federal Emergency Management Agency's (FEMA's) loss estimation software program for estimating potential losses from natural disasters can be an important tool in this process.

Hazard Mitigation Planning and the University Community

Hazard mitigation planning is a comprehensive approach to reducing losses from all hazards. For colleges and universities, it encompasses the protection of laboratory and research facilities, dormitories, classrooms, administration buildings, research documents and laboratory specimens, and infrastructure such as heating and cooling plants and computer network systems. The mitigation planning process generally consists of four phases: organizing the planning team; identifying hazards and assessing risks; developing and prioritizing loss reduction activities; and monitoring and updating the plan so that it remains current.

DMA 2000 and University/Community Partnerships

The impetus for undertaking hazard mitigation planning was given a boost in October of 2000 when the Disaster Mitigation Act of 2000 (DMA 2000) was signed by the President. Among other things, the DMA 2000 encourages and rewards pre-disaster planning and calls for increased coordination between state and local government planning. For the first time, local mitigation plans will be required in order to receive post-disaster hazard mitigation resources. Among other requirements, state and local plans must contain a description of the hazards that affect the jurisdiction, and the jurisdiction's vulnerabilities to those hazards. Using HAZUS as part of the planning process can help meet these new requirements

HAZUS-MH

Increasingly, planners are being called on to work with teams of specialists in other disciplines, such as engineers GIS specialists, geographers, and geologists. With the state-of-the-art software and risk assessment capabilities of HAZUS-MH, planners will be better equipped to work effectively in this environment. Geographical Information Systems (GIS) are of particular importance in planning because they provide a valuable tool for analyzing a tremendous amount of information, including demographics, land-use, the built environment, and natural hazards. FEMA is developing a GIS-based software program, Hazards United States, Multi-Hazard (HAZUS-MH), to be released in early spring of 2003. HAZUS-MH will contain new models for estimating potential losses from floods and hurricanes, in addition to an enhanced earthquake model. The software is available free of charge, although the user will need to have appropriate GIS software and computer hardware. HAZUS-MH can be used by decision-makers at all levels of government for planning mitigation, emergency response, and post-earthquake response and recovery.

A major benefit of HAZUS-MH is that it enables the user to analyze, in advance, potential estimates of building damage, economic loss, and disruption to lifelines and critical facilities due to natural hazards and then to design and implement measures to reduce expected losses. The HAZUS-MH program helps users determine the extent and location of a hazard. HAZUS-MH is a two-part tool that provides the user with information on where a hazard event is going to take place (e.g., floodplain determination based on topography and flood elevation information) and what is existing in a particular area (e.g., buildings, infrastructure). The program consists of three basic steps: (1) look at the physical hazard in a community; (2) assess the damage from inventory; and (3) calculate the economic loss (direct and indirect). Direct losses are losses such as the monetary costs incurred and indirect losses are losses such as the effects on the local economy, number of casualties, and number of shelters needed.

HAZUS-MH Models

HAZUS-MH will use state-of-the-art geographic information system software (ArcGIS) to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It will also allow users to estimate the impacts of hurricanes, floods, and earthquakes on populations.

- The **HAZUS-MH Hurricane Preview Model** will allow users in the Atlantic and Gulf coast regions of the United States to estimate hurricane winds and potential damage and losses to residential, commercial, and industrial buildings.
- The **HAZUS-MH Flood Model** will be capable of assessing riverine and coastal flooding. It will estimate potential damage to all classes of buildings, essential facilities, transportation lifelines, utility lifelines, vehicles, and agricultural crops.
- The **HAZUS-MH Earthquake Model**, an enhanced version of HAZUS99-SR2, provides loss estimates of damage and loss to buildings, essential facilities, transportation lifelines, utility lifelines, and population based on scenario or probabilistic earthquakes.

Conclusion

Many communities in the United States are subject to some risk from a natural or manmade disaster. These communities include those that have already experienced a threat from a natural hazard and those that will experience such a threat in the future. Communities that have a hazard mitigation plan in place or that have taken responsibility for their risks in advance are better positioned for disasters than those that have not. For example, these communities are able to avoid evacuating residents from flooded areas, reopen schools almost immediately after a hurricane, and avoid the loss of bridges and roads during earthquakes. In these communities, the floodwaters were not lower, the hurricane winds were not slower, and the ground shaking was not less severe. Rather, they were well prepared through sound floodplain management, good building construction techniques, and well-organized evacuation plans. HAZUS-MH provides a valuable new tool for planners for creating more of these sustainable communities. There are now significant opportunities for colleges and universities to participate in the planning process alongside their local and state hosts. The general increase in coordination that will result from the revitalized approach to planning will enable higher education institutions to enjoy closer partnerships with their host communities and states. These partnerships may also yield additional resources for universities to use in reducing their losses.

For More Information

Visit the HAZUS website www.fema.gov/hazus and the Mitigation Planning website www.fema.gov/fima/planning for addition information.