FUTURE WORK: WHAT STILL NEEDS TO BE DONE?

With accurate regional data, the modeling of risks from any hazard can be extended beyond earthquakes to improve our understanding of the potential impacts of these perils, providing a framework for building an all-hazard, disaster-resilient metropolitan area.

Although the building inventories and soil data developed in this study are invaluable for future regional studies, further involvement by emergency responders, planners, builders, and health and human services officials will help improve the effectiveness of this study. We recommend future work in the following key areas:

Earthquake Mitigation

The NYCEM team will continue to update building and soil information, refining and verifying the default database within HAZUS, as a tool for assisting area planners, responders, and other stakeholders. Additional data collection and study of regional lifeline systems (water, gas, sewerage, waste-water treatment, highway, and public transportation systems) will significantly enhance the risk characterizations that HAZUS can provide for the New York City area. Metropolitan transportation engineers are interested in being a part of possible future studies that would include transportation lifelines in the model. Additional and more accurate data, enabled by widespread participation by current and new stakeholders, will lead to the development of a better model to be embraced by responders, builders, and the public.

Multiple Hazards Mitigation

Historically, the NY-NJ-CT region has experienced many of the deadly forces of nature – hurricanes, floods, tornadoes, blizzards, and earthquakes – many already costing over $200 million per event, and the region continues to be at risk from man-made threats. With accurate regional data, the loss estimation methodology can be extended to include these and other hazards (e.g., terrorist attacks) to improve the disaster resiliency of the metropolitan area. In the near term, this research may be extended using the recently released HAZUS-MH (which provides loss estimations for earthquakes, hurricanes, and floods) to include all three hazards, and to expand the scope of the study to include lifelines, highways, bridges, subways, harbors, airports and other infrastructure. The figures on the next page illustrate risk concentration for a variety of hazards.

Emergency Response and Relief

Emergency response and relief agencies may use this study to project the demand on critical facilities (schools, hospitals, police, fire stations), as well as the financial and material resources required to assist victims. This could involve allocating limited funding for fire station or hospital retrofit. In addition, search and rescue operations may benefit from training in simulated situations and scenarios. By looking ahead, not only will we be able to identify areas, structures, and systems at highest risk and improve our understanding of the problem, but also our understanding of the number of lives and value at risk.

Facts About Hazards

- In the past quarter century alone, there have been more than 100 federally declared disasters in the Northeast, or on average, about 4 major disasters per year.
- These disasters have caused millions of dollars in damage to homes, communities, and businesses. More important is the impact on the people – from trauma, to injury, and even loss of life.
- Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss. In fact, 75 percent of federal disaster declarations are related to flooding. Property damage from flooding totals over $5 billion in the U.S. each year.
- Over the last 30 years, coastal population growth and accompanying property development have increased four-to-five percent per year. Because of this growth, the U.S. is more vulnerable to hurricanes now than at any time in recent decades. Today, more than 45 million people are permanent residents of hurricane-prone areas.
- Coastal storm surge flooding is becoming more frequent and severe as sea level is rising globally and locally. In fact, the rate of global sea level rise is accelerating, in part related to global warming. This requires the flood hazards from coastal storm surges to be updated periodically.
- Since 1990, severe winter weather and flooding caused 79 fatalities and upwards of $5 billion in damages.

The underlying figure shows a simulated hurricane hitting the northeast.