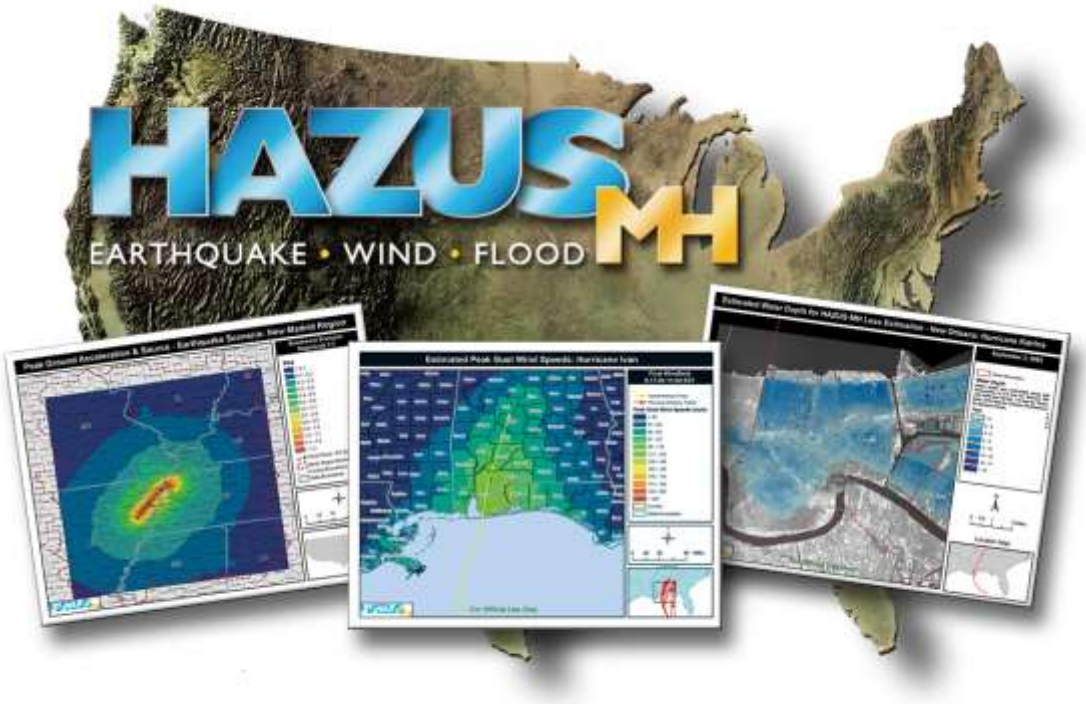
HAZUS-MH
Natural Hazard Loss Estimation

Eric Berman, GSIP

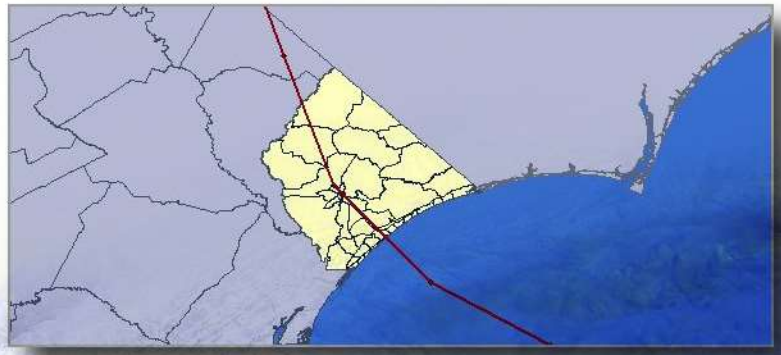
What is HAZUS-MH?

- **HAZUS-MH is FEMA Mitigation's Program for Estimating Potential Losses from Natural Disasters**



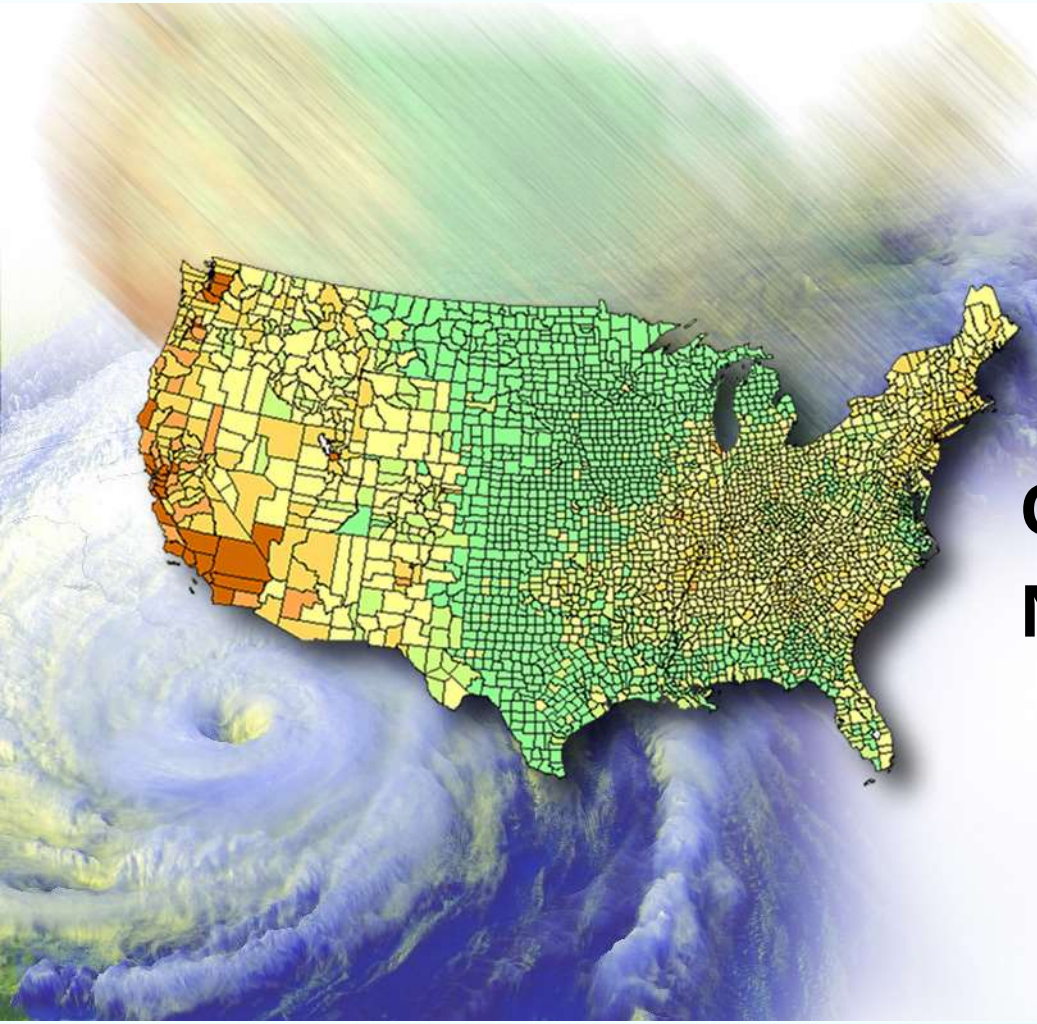
HAZUS-MH is a powerful risk assessment software program for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after, a disaster occurs.

HAZUS-MH Features



GIS Technology

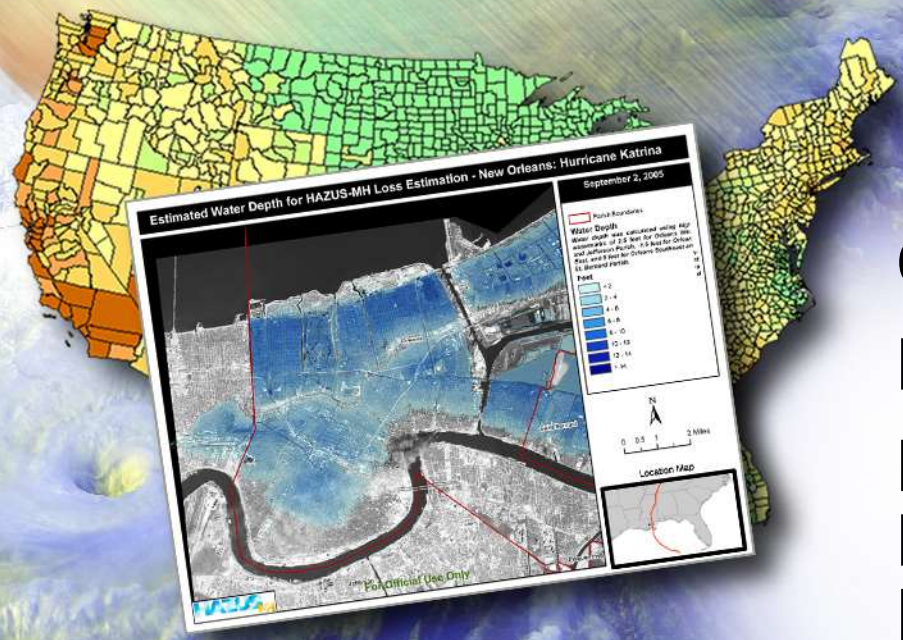
HAZUS-MH Features



GIS Technology

Nationwide Databases

HAZUS-MH Features

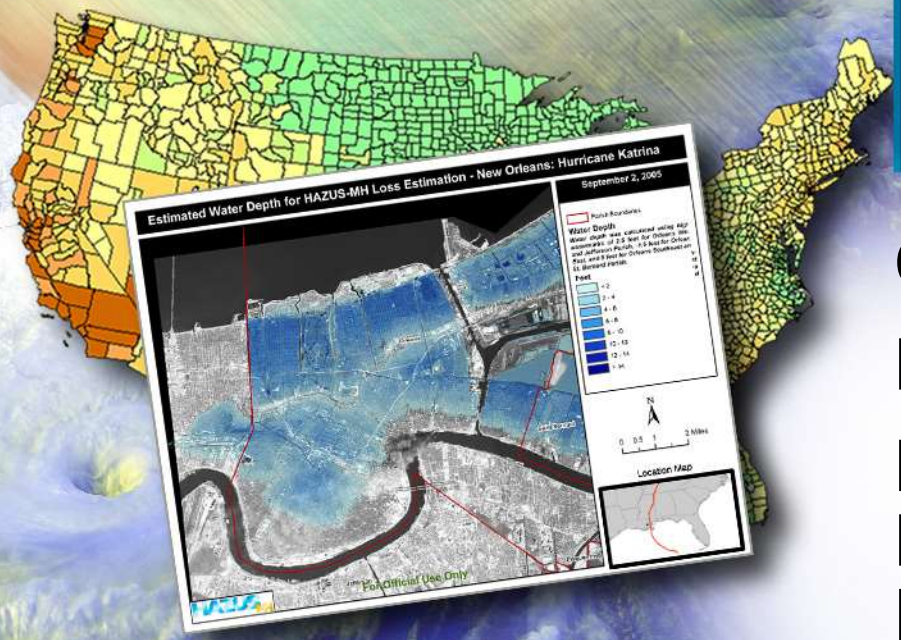


GIS Technology

Nationwide Databases

Nationally Standardized Loss Estimation and Risk Assessment Methodology

HAZUS-MH Features



Physical Impacts

Economic Impacts

Social Impacts

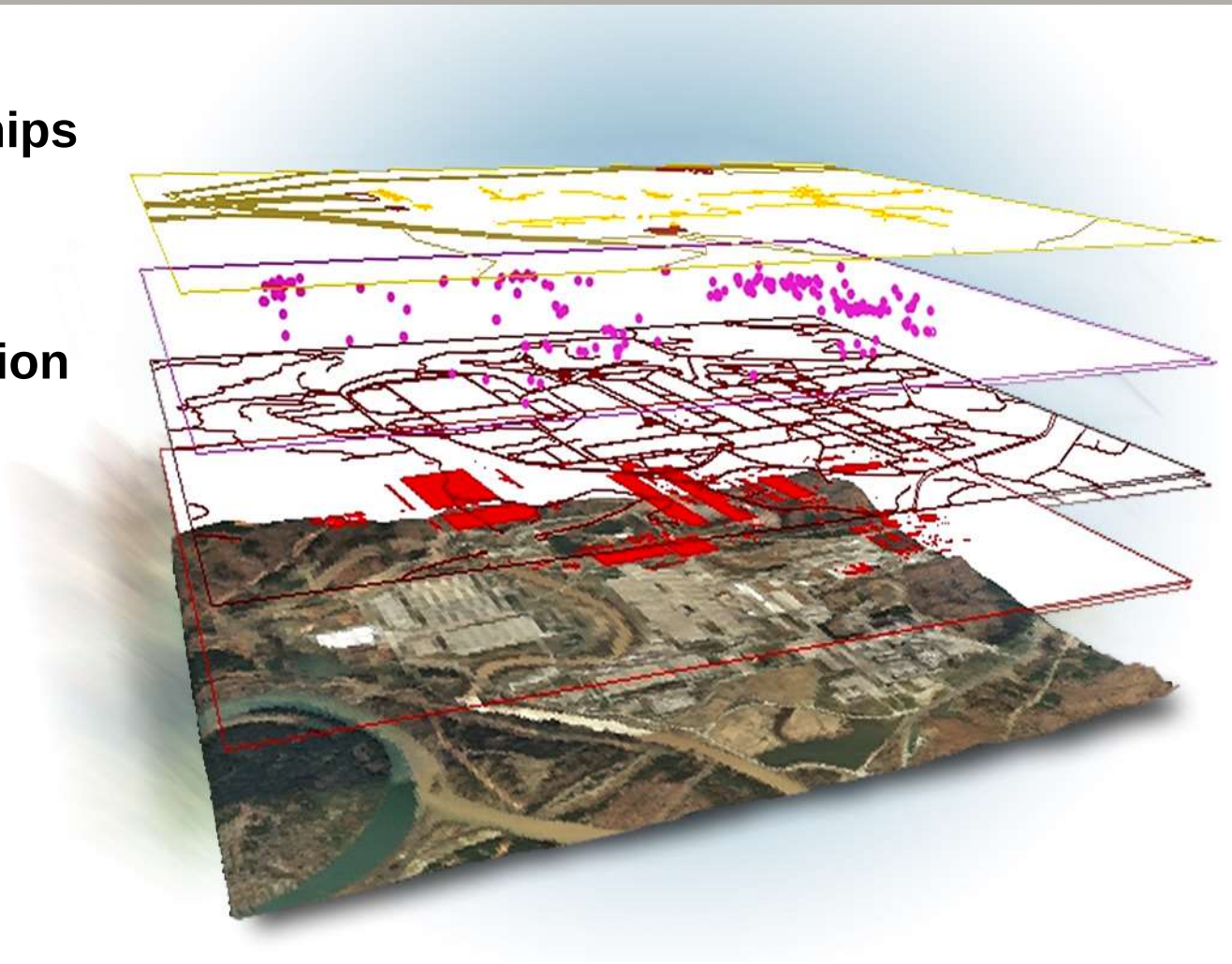
GIS Technology

Nationwide Databases

Nationally Standardized Loss Estimation and Risk Assessment Methodology

GIS Technology

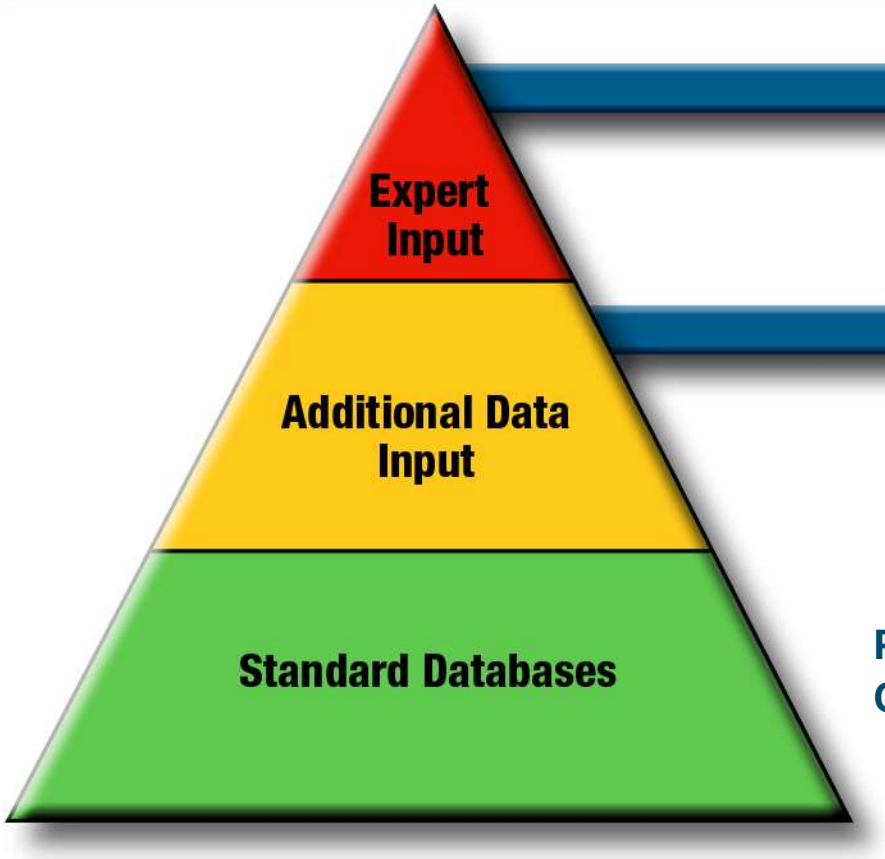
- **Spatial Relationships**
  - Layers
  - Computations
- **Risk Communication**
  - Risks
  - Solutions



Nationwide Databases

- **Demographics –** Population, Employment, Housing
- **Building Stock –** Residential, Commercial, Industrial
- **Essential Facilities –** Hospitals, Schools, Police Stations, Fire Stations
- **Transportation –** Highways, Bridges, Railways, Tunnels, Airports, Ports and Harbors, Ferry Facilities
- **Utilities –** Waste Water, Potable Water, Oil, Gas, Electric Power, Communication Facilities
- **High Potential Loss Facilities –** Dams and Levees, Nuclear Facilities, Hazardous Material Sites, Military Installations

HAZUS-MH: Analysis Levels



Parameter Modification

FIT (Flood Information Tool)
CDMS (Comprehensive Data Management System*)

Level 1 and 2 analyses can usually be performed by emergency services or planning staff

Level 3 analysis typically requires technical expertise

HAZUS-MH Methodology

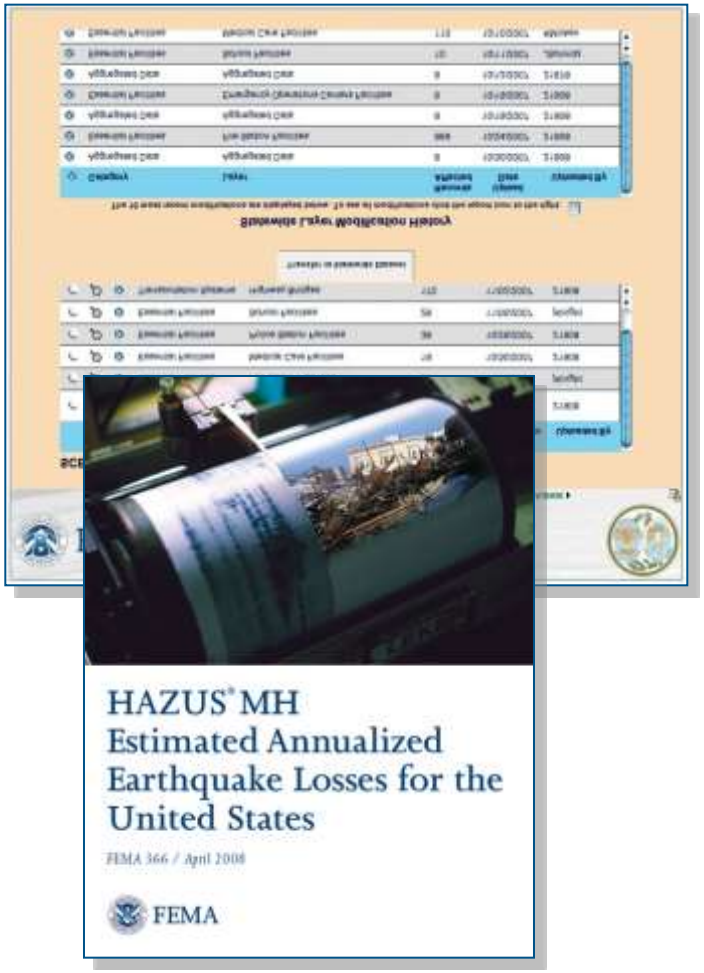
	Earthquake Ground Motion Ground Failure	Flood Frequency Depth Discharge Velocity	Hurricane Winds Pressure I Missile I Rain
Direct Damage			
General Building Stock	■	■	■
Essential Facilities	■	■	■
High Potential Loss Facilities	■		
Transportation Facilities	■	■	
Lifelines	■	■	
Induced Damage			
Fire Following	■		
Hazardous Materials Sites	■		
Debris Generation	■	■	■
Direct Losses			
Cost of Repairs/Replacement	■	■	■
Income Loss	■	■	■
Crop Damage		■	
Casualties	■	Generic Output	
Shelter and Recovery Needs	■	■	■
Indirect Losses			
Supply Shortages	■	■	
Sales Decline	■	■	
Opportunity Costs	■	■	
Economic Loss	■	■	

Benefits of Using HAZUS-MH

- Standardized Methodology
- Widely used
- Training available
- Established Users Groups

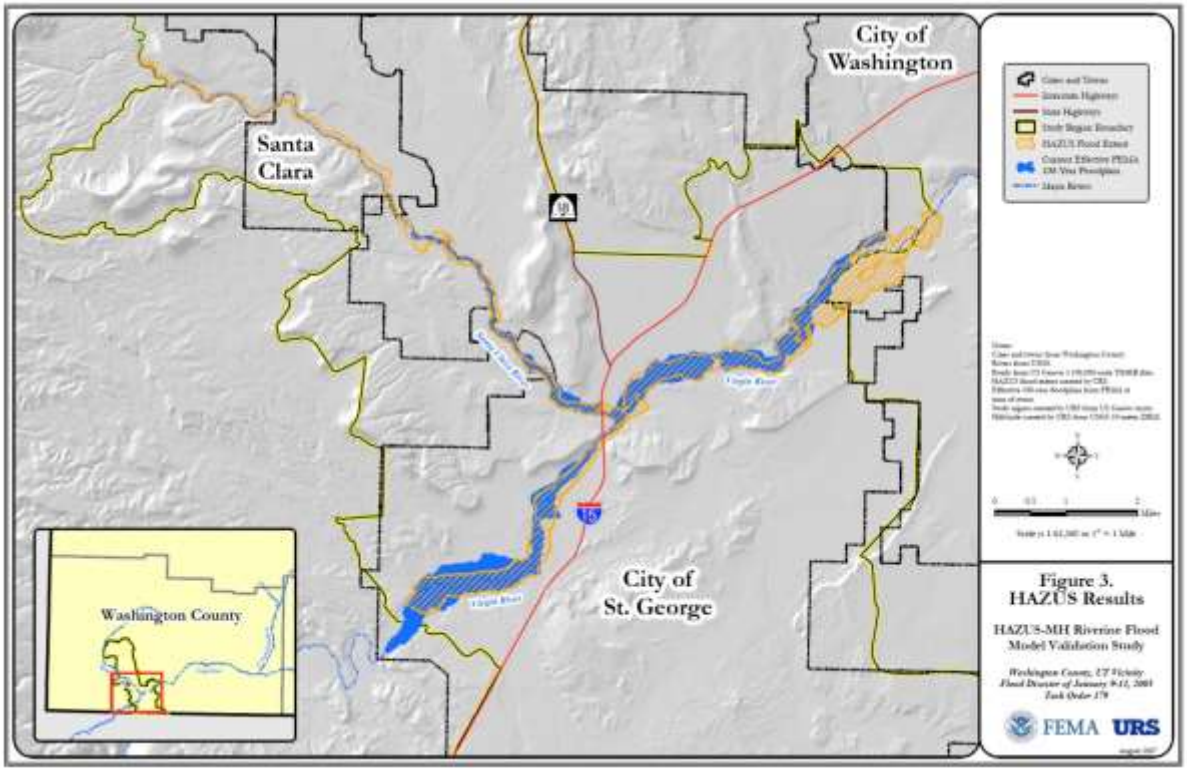
HAZUS-MH Special / Pilot Projects

- South Carolina Emergency Management Division Web Portal
- Florida Emergency Management Division Web Portal
- HAZUS-MH Annualized Earthquake Loss (AEL) Study



Flood Assessments

- **FEMA is compiling a National Average Annualized Flood Loss assessment using HAZUS-MH**



HAZUS-MH Virtual Training Courses

- **Virtual courses are available for HAZUS-MH. These on-line courses compliment the classroom training held throughout the year.**
- Getting Started with Hazus-MH 2.0
- Introduction to the Hazus-MH 2.0 Comprehensive Data Management System
- Introduction to the Hazus-MH 2.0 Inventory
- Introduction to the Hazus-MH 2.0 Storm Surge Model
- Introduction to the Hazus-MH 2.0 Earthquake Model
- Integrating User-Supplied Data into the Hazus-MH 2.0 Flood Model
- Loss Estimation Using the Hazus-MH 2.0 Hurricane Model

HAZUS-MH Virtual Training Courses (Continued)

Introduction to the Hazus-MH 2.0 Flood Model

Loss Estimation Using the Hazus-MH 2.0 Earthquake Model

Loss Estimation Using the Hazus-MH 2.0 Flood Model

Introduction to the Hazus-MH 2.0 Hurricane Model

Understanding Hazus-MH 2.0 Earthquake Model Results

Understanding Hazus-MH 2.0 Hurricane Model Results

Understanding Hazus-MH 2.0 Flood Model Results

HAZUS-MH Training at EMI

- **Regularly scheduled HAZUS training classes are held at FEMA's Emergency Management Institute (EMI) located on the National Emergency Training Center campus in Emmitsburg, MD, 75 miles north of DC.**

- **Courses provide instruction in all steps of the loss estimation process, from inventory verification and improvement to running a loss analysis; how to use HAZUS results for mitigation, as well as for comprehensive planning, response, and recovery activities; data management; and useful GIS concepts.**

EMI Certificate Program

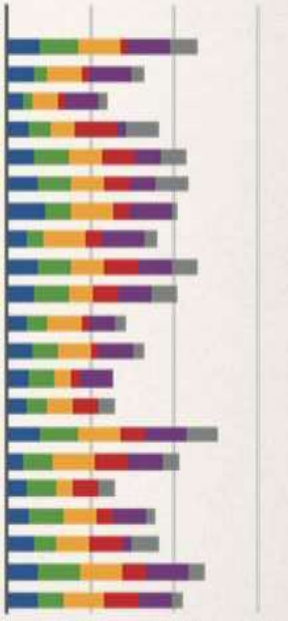
- **FEMA is launching a new initiative that recognizes emergency managers, GIS professionals and others who complete a structured HAZUS curriculum that has two tracks:**
  - **HAZUS-MH Trained Professional –** that provides a foundation of basic HAZUS-MH skills plus focused instruction on at least one hazard
  - **HAZUS-MH Practitioner Track –** that expands on the HAZUS Trained Professional Track by incorporating specialized training.


Disaster Resilience by Design:
Extending HAZUS-MH for Risk-Based
Planning & Decision Support in Canada
www.nrcan.gc.ca
2010
HAZUS MH
4TH ANNUAL CONFERENCE
Murray Journeay, Nicky Hastings, Bert Struik,
Miro Nastev & Malaika Ulmi
Natural Resources Canada
Ressources naturelles Canada
Canada

Risk Assessment Frameworks

moving beyond partial solutions

		hazard-risk, vulnerability, resilience	spatial extent & temporal horizon	hazard potential, damages, losses	hazard threats, level of concern	quantitative analysis & modelling	design, appraisal & evaluation
1	CAT	4.0	4.5	5.0	1.0	5.0	3.3
2	NDH	3.3	1.5	4.0	1.0	5.0	1.7
3	DRI	2.0	1.0	3.0	1.0	4.0	1.0
4	PDRA	2.7	2.5	3.0	5.0	1.0	4.0
5	EPSON	3.3	4.0	4.0	4.0	3.0	3.0
6	ARMONIA	3.7	4.0	4.0	3.0	3.0	4.0
7	GA	4.7	3.0	5.0	2.0	5.0	0.7
8	AGS	2.3	2.0	5.0	2.0	5.0	1.7
9	EMA	3.7	4.0	4.0	4.0	4.0	3.0
10	GNS	3.3	4.0	3.0	3.0	4.0	3.0
11	USRI	2.3	2.5	4.0	1.0	3.0	1.3
12	IDEA	3.0	3.0	4.0	1.0	4.0	1.3
13	ECLAC	2.7	3.0	2.0	1.0	4.0	0.0
14	GTZ	2.3	2.5	3.0	3.0	0.0	2.0
15	HAZUS-MH	4.0	4.5	5.0	3.0	5.0	3.7
16	LUPM	2.0	3.5	5.0	4.0	4.0	2.0
17	RVAT	2.3	3.5	2.0	3.0	0.0	2.0
18	SoVI	2.7	4.0	4.0	2.0	4.0	1.0
19	HIRV	3.3	2.5	4.0	4.0	1.0	3.3
20	CRM	3.7	5.0	5.0	3.0	5.0	2.0
21	EmerGeo	3.7	3.0	5.0	4.0	4.0	1.3



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HAZUS-MH Information

- **Visit the HAZUS website: http://www.fema.gov/plan/prevent/hazus**

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