



Major Disaster Response and Recovery

Challenges and Best Practices

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Recent Major US Disasters



US Disasters

Event	Date	Magnitude	Deaths	Damages
Loma Prieta Earthquake	1989	6.9	62	\$6B
Northridge Earthquake	1994	6.7	57	\$25B
Nisqually Earthquake	2001	6.8	0	\$3B
Hilo Hawaii Tsunami*	1960	8.3	61	\$23M
Alaska Tsunami	1964	9.2	110	\$300M
American Samoa Tsunami	2009	8.3	119	\$33M

* Earthquake in Chile



Similar International Disasters

- 2010 Haiti Earthquake
 - ▶ Magnitude 7.0
 - ▶ 2,200 deaths and 2,000,000 displaced residents
 - ▶ 180,000 homes destroyed
- 2004 Indian Ocean Tsunami
 - ▶ Magnitude 9.0
 - ▶ Impacts in 15 countries, 3 continents
 - ▶ 200,000 deaths and 1.7 million displaced residents
- 2011 Japan Earthquake and Tsunami
 - ▶ Magnitude 9.0
 - ▶ 6,500 deaths, 9,000+ missing, 380,000 displaced
 - ▶ \$180B in estimated damages



US DISASTER RECOVERY

Challenges and Best Practices

- **Risk Assessment and Planning**
- **Housing and Stabilization**
- **Infrastructure Recovery**
- **Long-Term Recovery and Mitigation**

Risk Assessment and Planning

Issue:

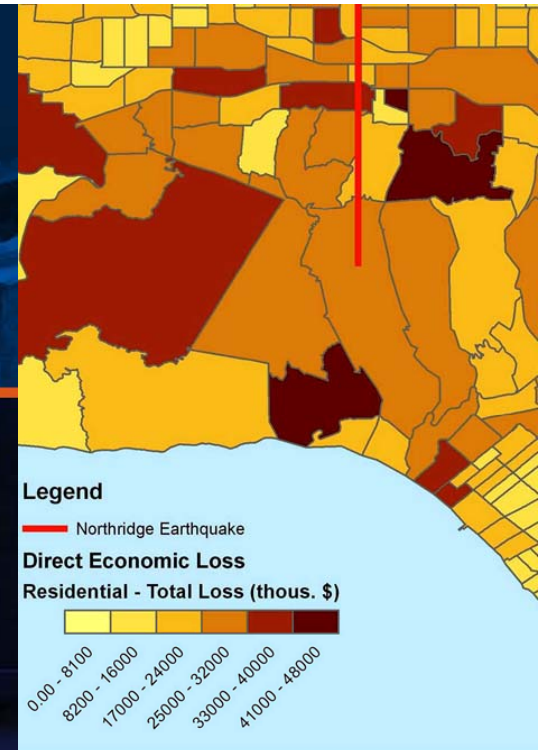
- ▶ Assessing highest risk states and scenario impacts

Challenge:

- ▶ Economic method for assessing risk with reasonable accuracy across wide array of hazards and built environment

Best Practice:

- ▶ Catastrophic plans (California)



HAZUS[®] MH
Estimated Annualized
Earthquake Losses for the
United States

FEMA 366 / April 2008



Housing and Stabilization

Issue:

- ▶ Long-term temporary housing needs for large populations

Challenge:

- ▶ Balancing economics and speed, combating secondary impacts

Best Practice:

- ▶ One size doesn't fit all, look at alternatives to trailers
- ▶ Provided more livable, safer temporary housing



Infrastructure Recovery

The background of the slide is a blue-tinted photograph of a building with a curved window. In the top right corner, there is an inset photograph showing a concrete structure that has been severely damaged, with large sections of concrete and rebar exposed and debris scattered on the ground.

Issue:

- ▶ Damages to facility systems, not just individual structures

Challenge:

- ▶ Funding restoration efforts to include structures not affected by the disaster

Best Practice:

- ▶ Provide technical resources to address system-wide impacts (utilities, justice facilities, hospitals, schools, etc.)
- ▶ Prepare recovery plan to consider overall systems

Long-Term Recovery and Mitigation

Issue:

- ▶ **Prioritization of recovery for economic stimulus and long-term resiliency**

Challenge:

- ▶ **Governance consideration and willingness for mitigation**

Best Practice:

- ▶ **Combine economic modeling and local input with recovery**
- ▶ **Demonstrate long-term cost effectiveness and benefits from mitigation**

