Building a More Resilient Nation

USGS Director Mark Myers
National Earthquake Conference
April 23, 2008
Last week’s magnitude-5.2 earthquake in Illinois

- Over 36,000 Did You Feel It? reports on the USGS web site
- Felt reports from 16 states plus Ontario, Canada
- Reminder that earthquakes are a national issue
Facing Tomorrow’s Challenges –
USGS Science in the Decade 2007-2017

Understanding Ecosystems and Predicting Ecosystem Change

Climate Variability and Change

Energy and Minerals for America’s Future

A National Hazards, Risk, and Resilience Assessment Program

The Role of Environment and Wildlife in Human Health

A Water Census of the United States
Hazards in the USGS Science Strategy

• Robust monitoring infrastructure and technology for network communications
• Characterizing and assessing hazards
• Improved forecasting capability based on understanding physical processes

In all these areas, partnerships are vital for a coordinated hazard and risk program
Advanced National Seismic System (ANSS)

Backbone completion with support from NSF’s EarthScope
ShakeMap now available as Google Earth transparent overlay

Wells, Nevada magnitude-6 earthquake
Feb. 21, 2008
ANSS monitoring of structures

Structural Array in Atwood Building, Anchorage AK
National Volcano Early Warning System: Closing the monitoring gap

<table>
<thead>
<tr>
<th>NVEWS TARGETS</th>
<th>MONITORING GAP</th>
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<tr>
<td>Kilauea, HI</td>
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Global Seismographic Network

9 new stations to support NOAA Caribbean tsunami warning system

- 32 stations upgraded
- Bandwidth expanded at 21 stations
- Telemetry added to 8 stations
Prompt Assessment of Global Earthquakes for Response

http://earthquake.usgs.gov/pager/

Overall, structures in this region are vulnerable to earthquake shaking, though some resistant structures exist. A magnitude 7.9 earthquake struck the offshore Bengkulu, Indonesia region on June 4, 2000, with estimated population exposures of 2,000 at intensity VIII and 510,000 at intensity VII, resulting in 103 deaths. Recent earthquakes in this area have also triggered tsunami, landslide and liquefaction hazards that have contributed to losses.
Integration of Earth Observation Systems

- Societal Benefits
- Science
- Societal Benefit

Desirability of Integration

Integration Categories
- Policy/Planning
  - Issue Specific
  - Scientific
- Technical

Required Investment & Development

Implementation
Seismic hazard assessments: National, regional, urban

U.S. National Seismic Hazard Maps

Uniform California Earthquake Rupture Forecast

Seattle urban hazard map
LIDAR: Revolutionizing hazard mapping in the Pacific Northwest and elsewhere

Bainbridge Island WA

Islandwood scarp

Toe Jam Hill scarp

Puget Sound

Image courtesy of M. Bevis, OSU
Land Use Portfolio Model used in Memphis

Parcels selected as having 60% or greater risk of major liquefaction
Scenarios: Making the hazard real
Southern California Earthquake Center: A collaboration with NSF and the university community

SCEC model of active faults in Southern California

Putting down roots in earthquake country

Trenching the San Andreas Fault
External grants and cooperative agreements: a key component of the Earthquake Hazards Program

- Approximately 25% of core program funds
- Gives flexibility and adds breadth of expertise to program
- Leverages support from other state and federal agencies, and universities

USGS-funded research by Goldfinger et al. uses turbidites to determine precise ages for earthquakes on the Cascadia Subduction Zone
External advice – SESAC and NEPEC

• **Scientific Earthquake Studies Advisory Committee**
  - Mark Zoback, *Chairman*
  - Ralph Archuleta (Chair, ANSS Steering Committee)
  - James Dieterich
  - Art Lerner-Lam
  - Vicki McConnell
  - Stuart Nishenko
  - John Parrish
  - Ellen Rathje
  - Garry Rogers

• **National Earthquake Prediction Evaluation Council**
  - Jim Dieterich, *Chair*
  - Dave Applegate*, *Vice-chair*
  - Ramon Arrowsmith
  - Göran Ekström
  - William Ellsworth*
  - David Jackson
  - Evelyn Roeloffs*
  - Barbara Romanowicz
  - Bruce Shaw
  - Wayne Thatcher*
  - Jeroen Tromp
  - Mary Lou Zoback

* USGS staff
USGS initiated Multi-hazard Demonstration Project in 2007

- Focused on reducing losses in Southern California: a region subject to multiple hazards
- Integrate information from multiple hazards to improve usefulness
- Work closely with dozens of partner organizations to leverage resources and optimize performance
The Great Southern California ShakeOut

- USGS and partners are creating complete “rupture-to-recovery scenario” for plausible worst-case earthquake
- Agreement with Office of Homeland Security to use this scenario for the 2008 “Golden Guardian Exercise”; includes school and business drills
• Exploring the structure and evolution of the North American continent
• Understanding processes causing earthquakes and volcanic eruptions
The mandate of the National Earthquake Hazard Reduction Program

- Develop effective measures for earthquake loss reduction;
- Promote their adoption;
- Improve the understanding of earthquakes and their effects on communities, buildings, structures, and lifelines.

Northridge 1994
Draft NEHRP strategic plan available for public comment

• Identifies strategic priorities for NEHRP
• Comments accepted until May 9th
• Visit www.nehrp.gov
Science in partnership - a more resilient Nation
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