



## Status Report



# USGS Earthquake Hazards Program of the National Earthquake Hazards Reduction Program

for the

## Advisory Committee on Earthquake Hazards Reduction

November 8-9, 2011

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U. S Geological Survey  
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# USGS Management Status

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Hazards Mission Area – Dave Applegate, USGS Associate Director

Volcanoes

Landslides

Coastal and Marine

## **Earthquake Hazards/Global Seismology/Geomag Programs**

John Filson (Acting) Program Coordinator , Reston VA

Michael Blanpied, Assoc. Program Coordinator.

William Leith, Assoc. Program Coordinator/ANSS Coordinator

Elizabeth Lemersal, External Support Manager

Jill McCarthy - Director, Geologic Hazards Center, Golden, CO

Tom Brocher - Director, Earthquake Hazards Center, Menlo Park, CA

# EHP Budget Update

Sums in \$1,000

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FY 2011 Appropriation: \$55,979\*

FY 2012 Request: \$52,326\*

\$2,000 cut to external grants

\$1,000 cut to multi-hazards

House mark: \$55,139\*

Senate mark: \$55,214\*

\* Does not include Global Seismograph Network ~ \$5,300

# USGS EHP Recent Accomplishments

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## Objective 1 - Advance understanding of earthquake phenomena and processes

- Began paleo-seismic and paleo-tsunami field work in Aleutians and Haiti (OFDA)
- Post-earthquake response studies on events in Virginia, Oklahoma, and Arkansas
- Renewed emphasis on induced seismicity.
- Re-assessment of geodetic movement in central US, small but non-negligible
- Field studies on site amplification, topographic amplification, and earthquake triggering of landslides. New Madrid, California, Nevada, and Hawaii
- Continued development of synthetic, broadband strong motion seismograms for application in areas of large, infrequent earthquakes e. .g central US.

# USGS EHP 2012 Plans

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## Objective 1 - Advance understanding of earthquake phenomena and processes

- Conduct comprehensive studies of Virginia earthquake. Begin compendium report.
- Develop capability to understand induced seismicity.
- Develop and implement sustainable geodetic studies and monitoring effort.

# USGS EHP Recent Accomplishments (cont)

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## Objective 5. Assess earthquake hazards for research and practical applications

- Utah working group on earthquake probabilities and Wasatch fault studies.
- Urban seismic hazard maps for Evansville ,IN. and Saint Louis, MO.
- Participation in NGA-East development of new attenuation relationships for Eastern United States.
- Continued work on seismic hazards maps of Samoa and Guam.
- Major participation in new Unified California Earthquake Rupture Forecast (aka UCERF3) and development of an operational earthquake forecasting “system”. Involved conduct of 8 workshops in support of this effort.
- NEPEC review of New Madrid seismic hazard

# USGS EHP 2012 Plans

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## Objective 5. Assess earthquake hazards for research and practical applications

- Complete urban seismic hazard maps
- Begin process for revision of National Seismic Hazard Maps –regional workshops.
- Complete report to California Earthquake Authority on UCERF3.

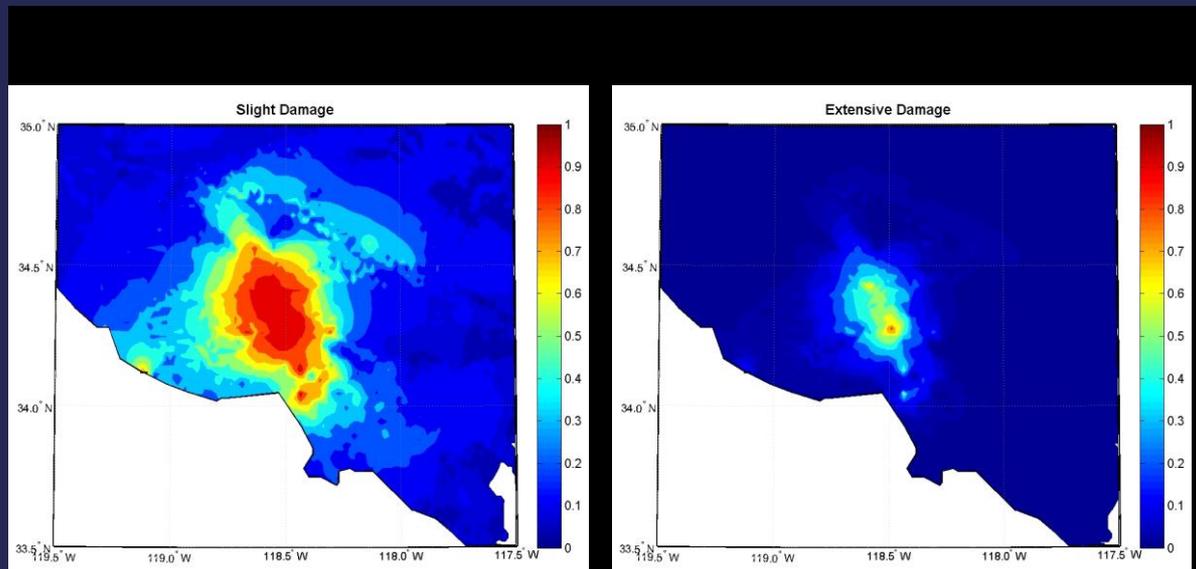
# USGS EHP Recent Accomplishments (cont)

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## Objective 6 - Develop advanced loss estimation and risk assessment tools

- Research on the development of potential damage maps

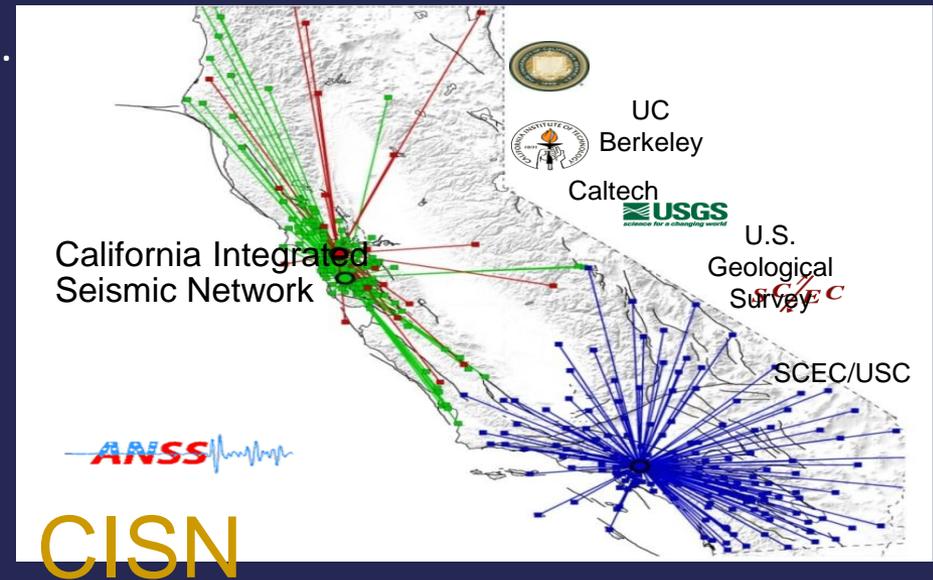
Northridge low-rise, un-reinforced masonry buildings. Derived by combining fragility curves with ground motions from ShakeMaps (with uncertainties). Shows probability of exceeding a given damage-state .



# USGS EHP Recent Accomplishments (cont)

## Objective 9 - Improve earthquake information products.

- ARRA supported strengthening of National Earthquake Information Center (NEIC)
- Earthquake Early Warning prototype development in progress.
  - ARRA funding for new data loggers.
  - Moore Foundation support
  - Possible CISN cuts by State



# USGS EHP 2012 Plans

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## Objective 6 - Develop advanced loss estimation and risk assessment tools

- Upgrade and expand risk and hazard assessment tools on the web.

## Objective 9 - Improve earthquake information products

- Pursue development and testing of prototype EEW system.
- Pursue integration of real-time geodetic data into routine earthquake impact assessment operations – ShakeMap, PAGER.
- Cooperative upgrade of northern Baja, Mexico, seismic network with NORTHCOM funding.
- Modernize NEIC analysis products and ANSS composite earthquake catalog.

# USGS EHP Recent Accomplishments (cont)

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## Objective 10 - Develop comprehensive earthquake scenarios and risk assessments

- Supported FEMA National Level Exercise Spring 2011 (a lot of work!)
  - Develop scenario for major earthquake sequence in central us. These were the basis of the exercise.
  - “Countless “ planning meetings with DHS and FEMA staff.
  - Deployed experts to regional and national response centers.

## Objective 13 - Increase public awareness of earthquake hazards and risk

- Supported the Central US ShakeOut preparedness exercise – 3 million participants in 11 states.
- Supported the California ShakeOut exercise – 8.6 million participants

# USGS EHP 2012 Plans

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## Objective 10 - Develop comprehensive earthquake scenarios and risk assessments

- Continue to provide earthquake scenarios.
- Demand is exceeding our capacity

## Objective 13 - Increase public awareness of earthquake hazards and risk

- Continue to support ShakeOut exercises.
- Continue support of New Madrid Bicentennial exercises.

# USGS EHP Recent Accomplishments (cont)

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## Develop, operate, and maintain NEHRP facilities – Advanced National Seismic System

ANSS modernization with ARRA funding nearly complete - \$19.2 million.

- Replacement equipment purchases: 57%
- Installation costs: 24%
- Regional network facilities upgrade: 8%
- NEIC hardening : 6%
- Misc: 5%
- Plans in place made USGS/ANSS “shovel ready”. Reporting and accountability requirements enforced a heavy administrative burden, complicated by distributed nature of ANSS.

# VA Instrumentation Project: Status Update

- Total budget is \$6.5 million
- Project has a total of 27 medical centers for seismic instrumentation
- Instrumentation of 13 hospitals is completed

<b>FY09</b> <b>[4 structure]</b>	<b>FY10</b> <b>[9 structure]</b>	<b>FY11</b> <b>[7 structure]</b>	<b>FY12</b> <b>[7 structure]</b>
<ul style="list-style-type: none"> <li>✓ Menlo Park, CA</li> <li>✓ Palo Alto, CA</li> <li>✓ Palo Alto, CA</li> <li>✓ Sepulveda, CA</li> </ul>	<ul style="list-style-type: none"> <li>✓ Anchorage, AK</li> <li>✓ San Juan, PR</li> <li>✓ Seattle, WA</li> <li>✓ West Los Angeles, CA</li> <li>✓ West Los Angeles, CA</li> <li>✓ Livermore, CA</li> <li>✓ San Francisco, CA</li> <li>✓ Los Angeles, CA</li> <li>✓ Portland, OR</li> </ul>	<ul style="list-style-type: none"> <li>○ Memphis, TN</li> <li>○ Memphis, TN</li> <li>○ Reno, NV</li> <li>○ Reno, NV</li> <li>○ White City, OR</li> <li>○ Fort Harrison, MO</li> <li>○ Roseburg, OR</li> </ul>	<ul style="list-style-type: none"> <li>○ American Lake, WA</li> <li>○ Poplar Bluff, MO</li> <li>○ Salt Lake City, UT</li> <li>○ San Diego, CA</li> <li>○ Charleston, SC</li> <li>○ San Juan, PR</li> <li>○ Marion, IL</li> </ul>

# USGS EHP 2012 Plans

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## Develop, operate, and maintain NEHRP facilities – Advanced National Seismic System

- Maintain current ANSS capabilities.
- Deal with CISN cuts if necessary
- Increase coverage in eastern US if possible
- Complete VA hospital instrumentation

## Other

- Response to foreign and domestic earthquakes puts a heavy burden on USGS staff and resources. Haiti (USAID Study), Chile, Tohoku, Christchurch, Virginia (study underway) and Turkey, for example.
- NEHRP needs a policy and process to preserve lessons learned or these efforts will be wasted and the lessons lost.