Progress Developing the Advanced National Seismic System

UJ NR Earthquake Research Panel
November 9, 2006

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What can an advanced earthquake monitoring system do?

- Provide rapid notification of earthquake occurrences and effects to speed emergency response and recovery.
- Promote mitigation through application of earthquake hazard assessments and data in building codes, structure design, and civic planning.
- Provide data for basic and applied research on earthquake effects and to improve hazard assessments.
- Improve public education and awareness.

All of these activities rely on improved monitoring data...
The Advanced National Seismic System

• An integrated national monitoring system
• A focus on the areas of highest risk
  – 26 urban areas slated for dense instrumentation
• A commitment to rapid delivery of earthquake information to critical users and the public
• A strategy to gather critically needed data on earthquake effects on structures
• A system built through close partnerships with States and local jurisdictions

• 6000 strong motion sensors in 26 at-risk areas
• 50% of these instruments in buildings and structures
• 1000 new or upgraded regional stations
• 100-station Backbone National Network
The Building Blocks of the ANSS

- National Earthquake Information Center
  - NEIC, Golden, Colorado

- National Seismic Network
  - ("ANSS Backbone")

- 16 Regional Seismic Networks
  - and data centers at Fairbanks, Seattle, Menlo Park, Pasadena, Reno, Salt Lake City, Memphis, New England

- National Strong Motion Network
Growth of ANSS Stations Since Inception

ANSS Costs: Capitalization $172M, Operations $43M/yr
ANSS Accomplishments

- ~700 new earthquake sensors installed; National and Regional Network upgrades begun.

- *ShakeMap* capability implemented in Los Angeles, San Francisco, Seattle, Salt Lake and Anchorage

- Real-time products and integrated communications, data analysis, and reporting under development

- Management and technical plans completed; National and regional structures in place; 26 technical performance standards established
ANSS Backbone: Estimated Detection Capability

Simulated future detection capabilities with 22 planned ANSS backbone stations added
Structural Array in Atwood Building, Anchorage

Instrumentation monitors for drift, translation, torsion, and rocking
Real-time GPS on Factor Building, Los Angeles

Instrumentation monitors for permanent drift, translation, torsion
ANSS Products: *ShakeMap*

rapid mapping of strong ground shaking
grew out of the Northridge earthquake experience

Northridge: Intensity IX
Parking Garage Collapse

Newhall: Intensity IX
Collapse of Overpass

Granada Hills: IX
Gas/Water Line Rupture

Provides a rapid indication of probable areas of earthquake damage
ANSS Products

Latest Earthquakes

Earthquake Notification
Customizable earthquake information wherever you are. Multiple addresses and regions, magnitude thresholds, etc. http://earthquake.usgs.gov/eqcenter/

ShakeMaps
Distribution of shaking from an earthquake anywhere in the World within minutes. http://earthquake.usgs.gov/shakemap/

PAGER
Estimated impact of an earthquake anywhere in the World within minutes. Exposed population, etc. http://earthquake.usgs.gov/pager/

Realtime Feeds & Data

Did You Feel It?
Citizen science webpage where shaking intensity maps are created by the people who felt the earthquake. http://earthquake.usgs.gov/dyfi/

ShakeCast

CISN Display
Downloadable software to visualize and receive notifications for seismicity anywhere in the World on your computer. http://www.cisn.org/software/cisndisplay.html

SISN

Earthquake Data

Seismogram Displays
Watch the shaking as it happens on a variety of online displays. http://earthquake.usgs.gov/eqcenter/helicorders.php

Info by Region
Pick a state, or a country, and find out about current and past earthquakes, seismic hazard, local agencies, etc. http://earthquake.usgs.gov/eqcenter/

Aftershock Forecast Map
Time-dependent map giving the probability of aftershocks at any location in California within the next 24-hours. http://earthquake.usgs.gov/eqcenter/
What are the benefit areas?

- Emergency Response and Recovery
- Tsunami Warning
- Loss Estimation Modeling
- Improved Building Codes and Land Use Regulations
- Performance-Based Engineering
- Insurance and Reinsurance
- Public Confidence and Understanding
Earthquake Early Warning: Rapid reporting of seismic shaking in urban areas and up to tens of seconds warning of imminent ground shaking.
Earthquakes

Earthquake Hazards Program

Welcome to the U.S. Geological Survey Earthquake Hazards Program

News & Highlights

Magnitude 7.6 BANDA SEA
January 27, 2006
01/19/06 - National Earthquake Center Goes 24/7
Magnitude 6.8 SOUTHERN GREECE January 08, 2006
Magnitude 6.6 GULF OF CALIFORNIA January 04, 2006
Magnitude 3.6 ILLINOIS January 02, 2006
Magnitude 7.3 EAST OF THE SOUTH SANDWICH ISLANDS January 02, 2006

News & Highlights

Archive

Recent Earthquake Activity

Latest Earthquakes - Last 7 Days

World (Magnitude 2.5+)
Thu Feb 02 22:17:17 UTC

USA (Magnitude 1+)
Thu Feb 02 22:02:38 UTC

World Lists Magnitude 2.5/4+ | 5+
Last EQ in World

USA Lists Magnitude 1+ | 3+
Last EQ in USA