



Earthquakes ★ Floods ★ Hurricanes ★ Landslides ★ Tsunamis ★ Volcanoes ★ Wildfires

# USGS Presentations

## ACEHR Meeting, Golden CO

### October 23-24, 2007



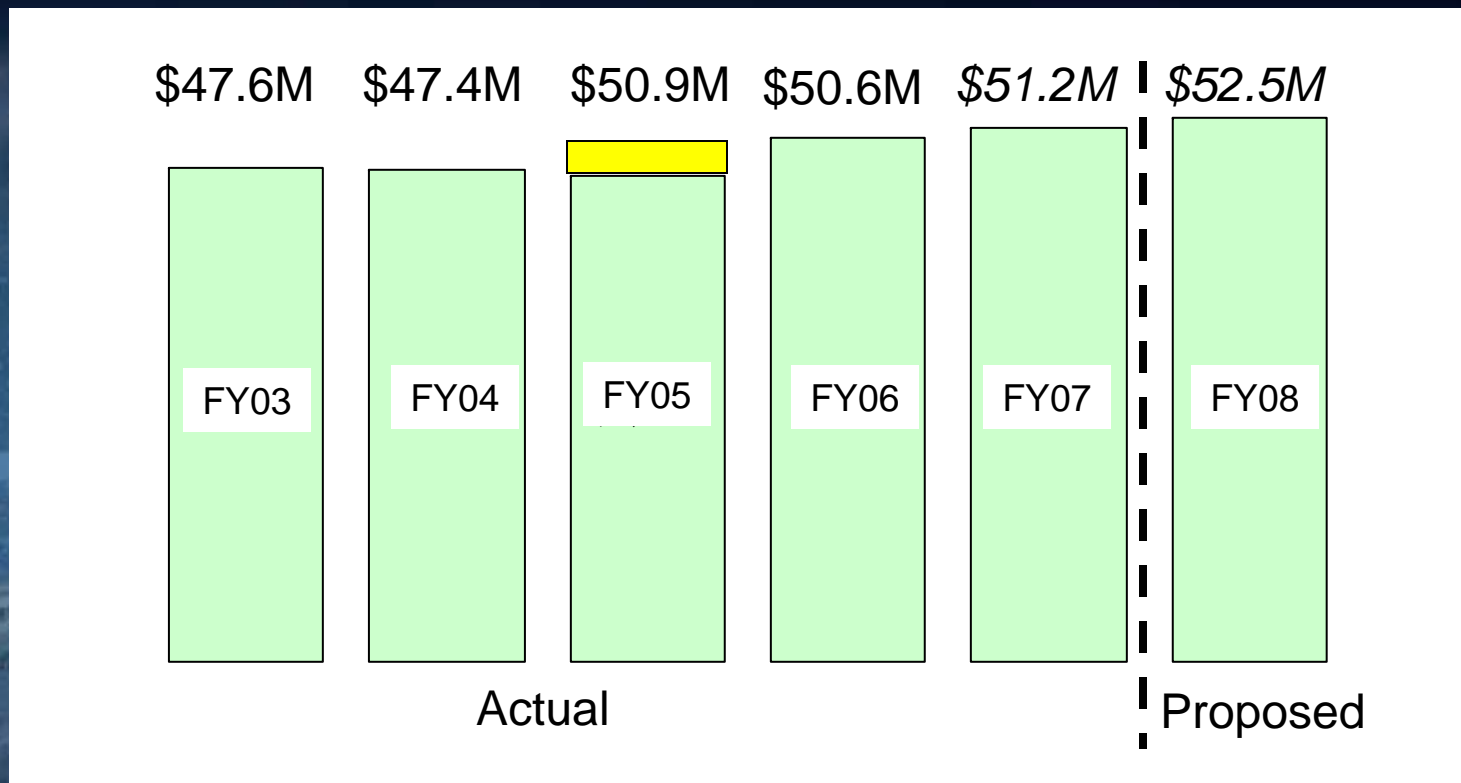
U.S. Department of the Interior  
U.S. Geological Survey

# Recent USGS Program Changes

 USGS



# Recent Earthquake Hazards Program funding history and FY08 request



Tsunami Supplemental  
(became part of base in FY06)

# USGS Role in President's Tsunami Warning Initiative

- Operate NEIC 24-hours-a-day seven days a week
- Enhance NEIC hardware and software
- Make all possible GSN stations available in real time
- Place GSN stations in the Caribbean
- Coastal mapping for tsunami hazard assessment
- Implement PAGER
- Enhanced distribution of NOAA tsunami warnings





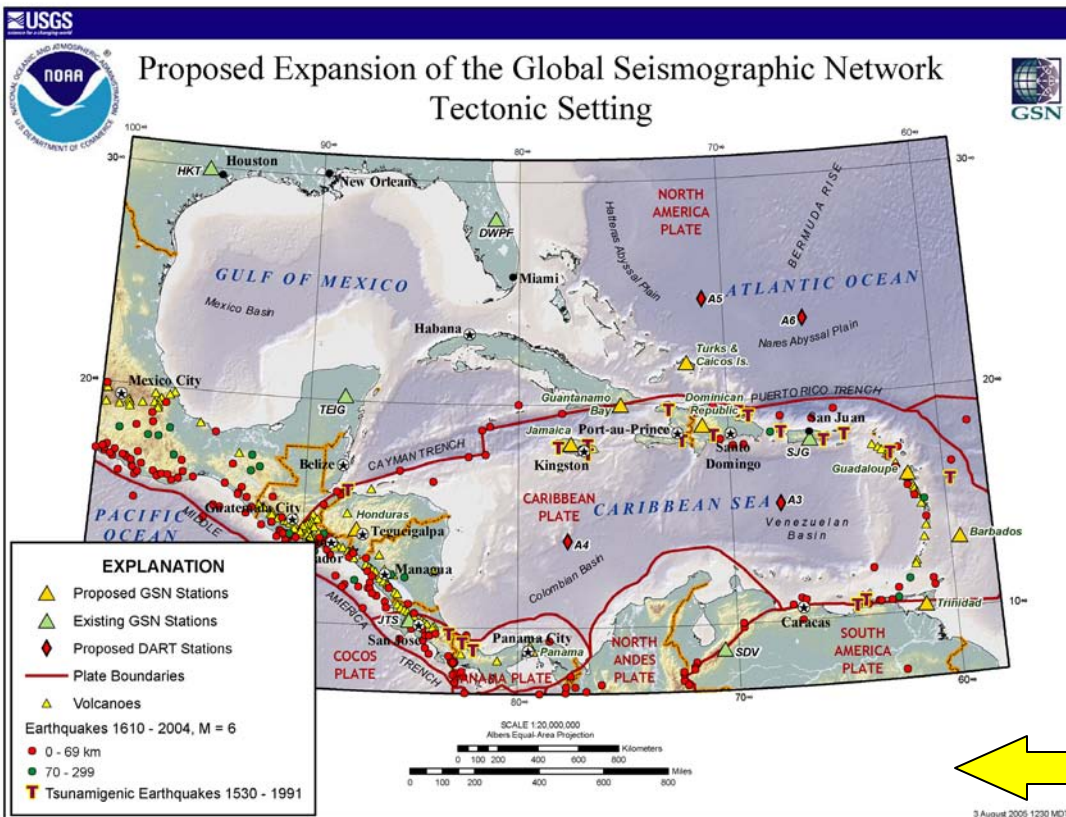
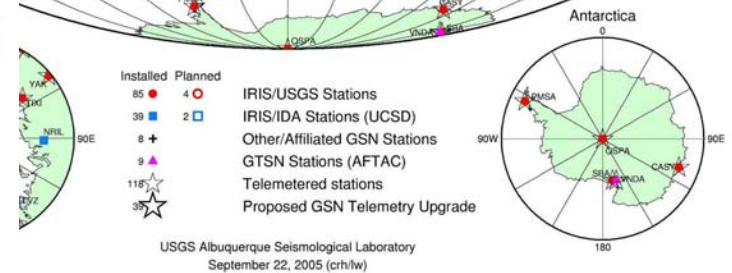
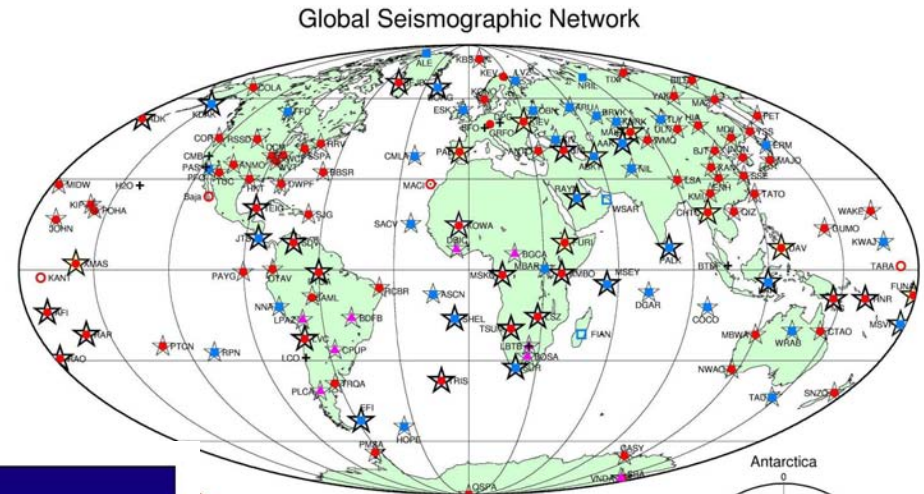


*USGS National Earthquake  
Information Center,  
Golden, Colorado*



# Global Seismographic Network

**FY 2005 enacted: \$3.4 million**  
**FY 2005 supplemental: +\$4.1M**  
**FY 2006 enacted: \$3.9M**  
**FY 2007 operating plan: \$3.9M**  
**FY 2008 request: \$4.0M**



- 32 stations upgraded
- Bandwidth expanded at 21 stations
- Telemetry added to 8 stations

**9 new stations**





# PAGER

## Prompt Assessment of Global Earthquakes for Response

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



### M 8.4, SOUTHERN SUMATRA, INDONESIA

Origin Time: Wed 2007-09-12 11:10:26 UTC

Location: 4.52°S 101.38°E Depth: 30 km



### PAGER Version 11

Created: 6 hrs, 7 mins after earthquake

### Estimated Population Exposed to Earthquake Shaking

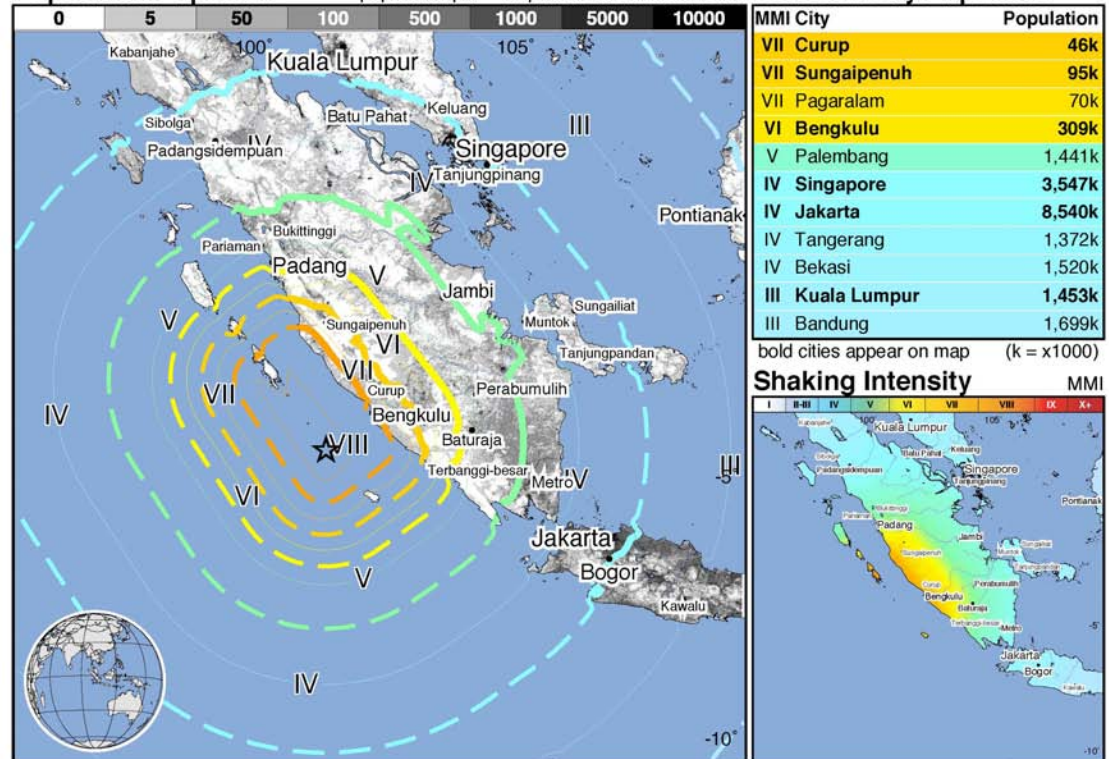
ESTIMATED POPULATION EXPOSURE (k = x1000)	--*	54,342k*	53,605k	12,285k	2,632k	2,014k	480k	0	0	
ESTIMATED MODIFIED MERCALLI INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+	
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme	
POTENTIAL DAMAGE	Resistant Structures	none	none	none	V. Light	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy
	Vulnerable Structures	none	none	none	Light	Moderate	Moderate/Heavy	Heavy	V. Heavy	V. Heavy

\*Estimated exposure only includes population within the map area.

#### Population Exposure

population per ~1 sq. km from Landscan 2005

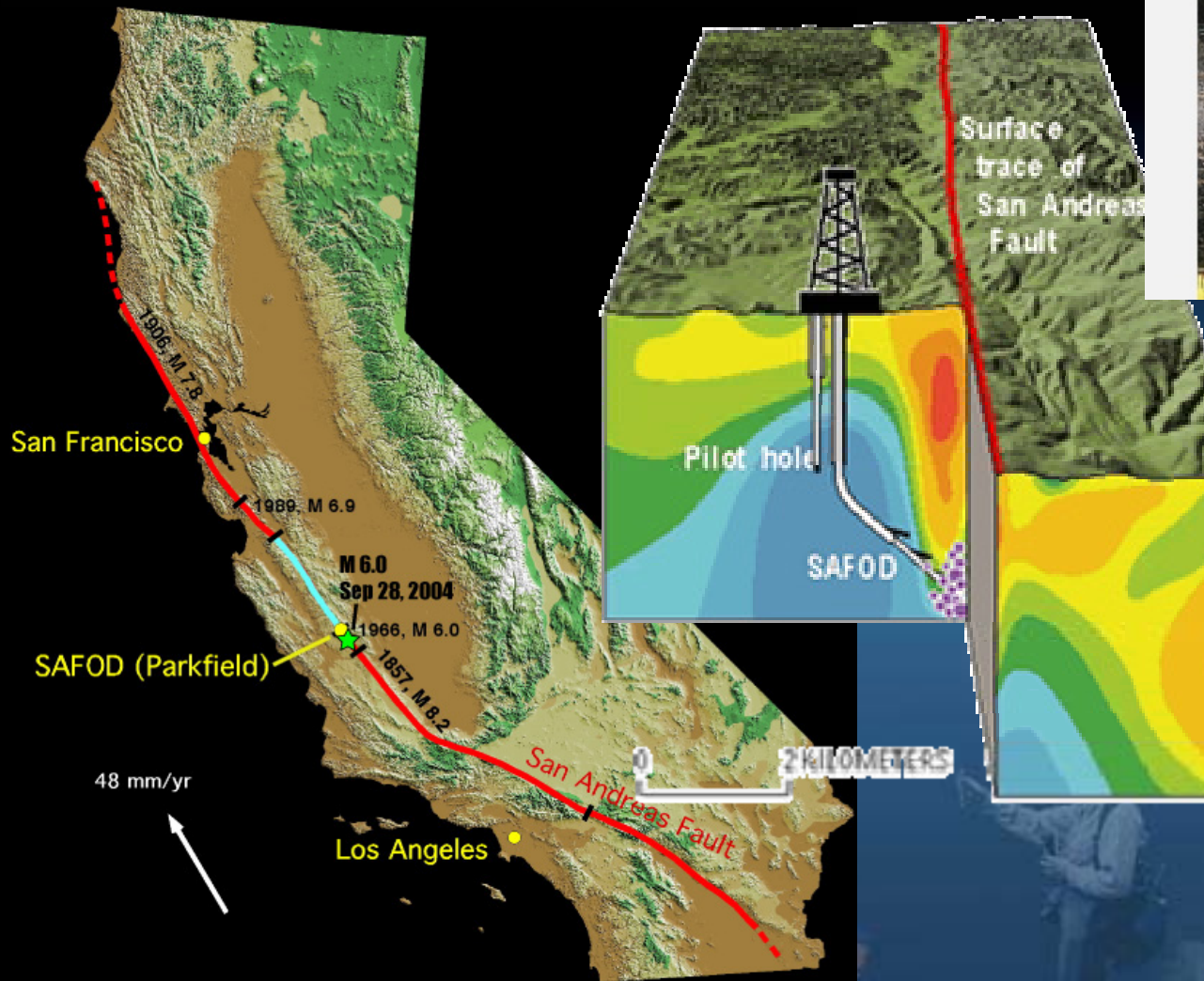
#### Selected City Exposure



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, landslides and liquefaction hazards that have contributed to losses.



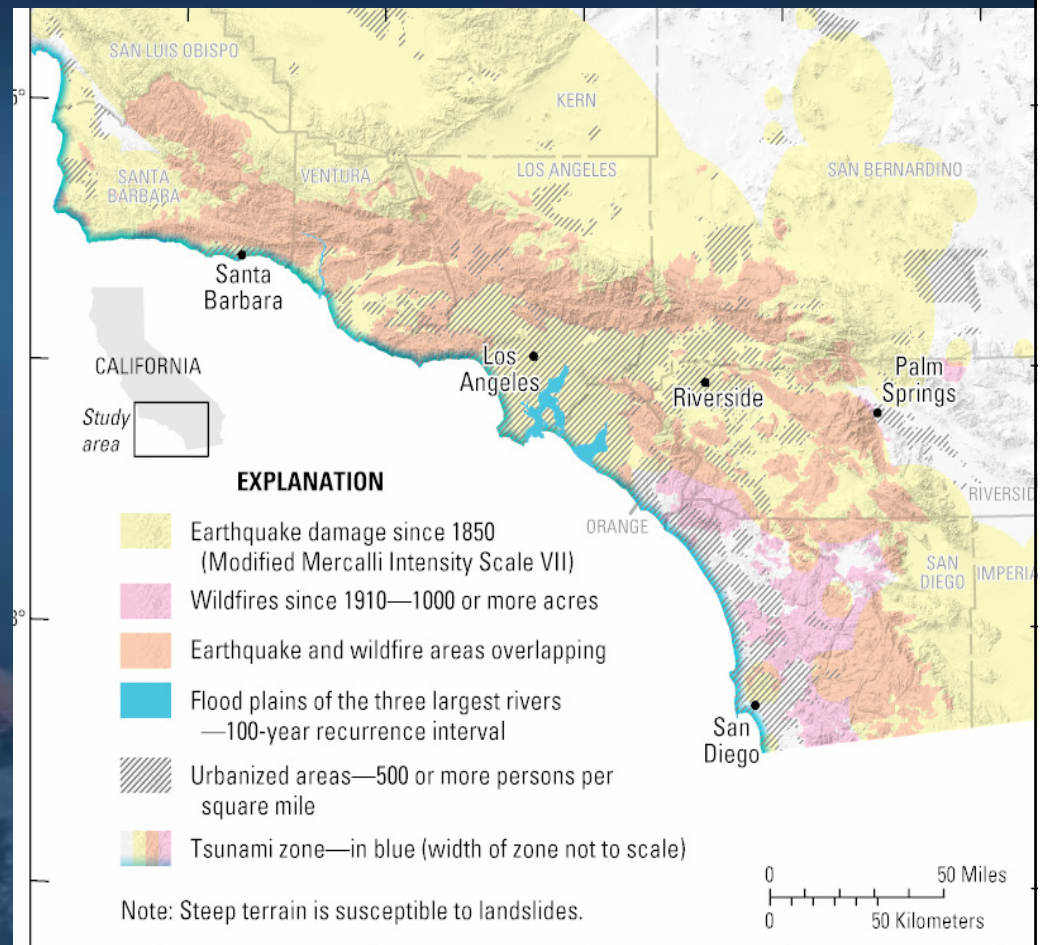
# Parkfield and SAFOD





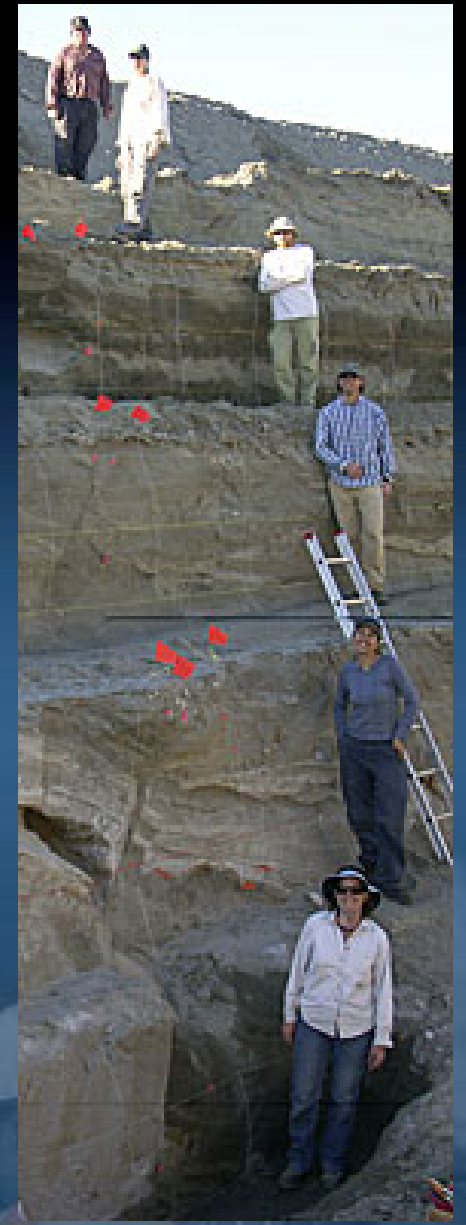
# USGS hazards initiative in FY07: Multi-hazard demonstration project

- 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



# Southern San Andreas Fault Evaluation project

- Digging into the fault because the past is the key to understanding the future
- Targeted research to fill critical gaps in our understanding of the southern San Andreas Fault
- Carried out with academic partners through Southern California Earthquake Center



USGS



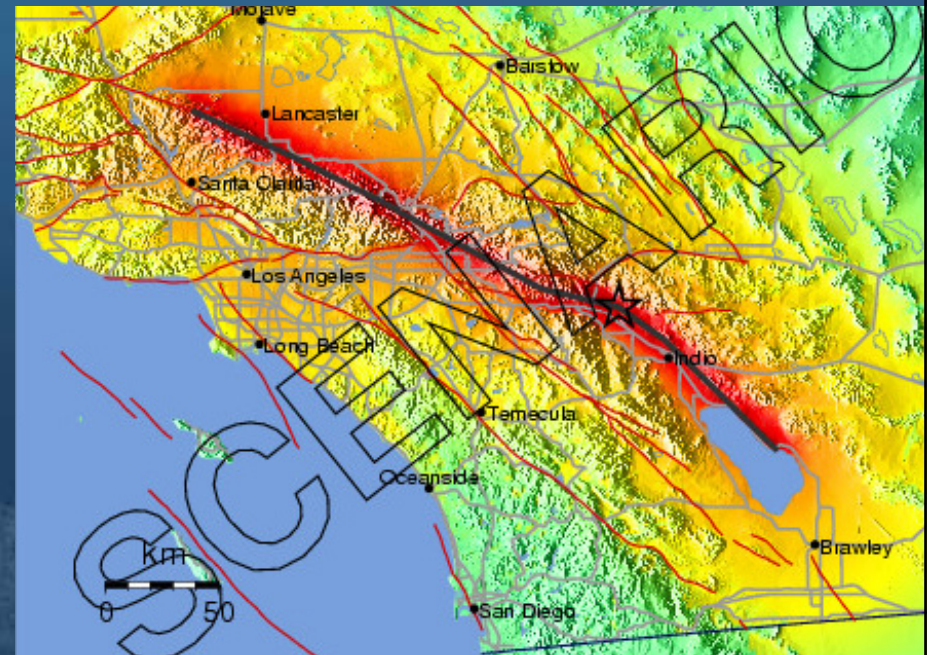
**SoSAFE**

SOUTHERN SAN ANDREAS FAULT EVALUATION



# The Great Southern California ShakeOut

- USGS and partners will create complete “rupture-to-recovery scenario” for most likely earthquake
- Use scenario to run region-wide exercise in 2008
- Agreement with Office of Homeland Security to make this the 2008 “Golden Guardian Exercise”





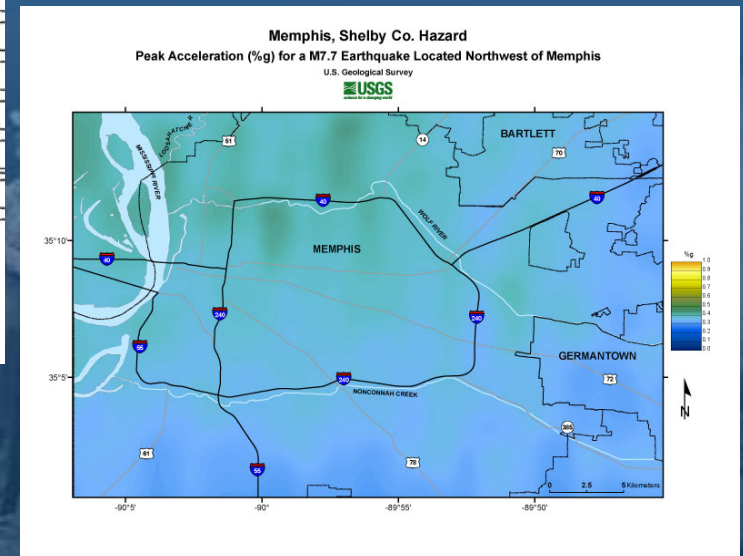
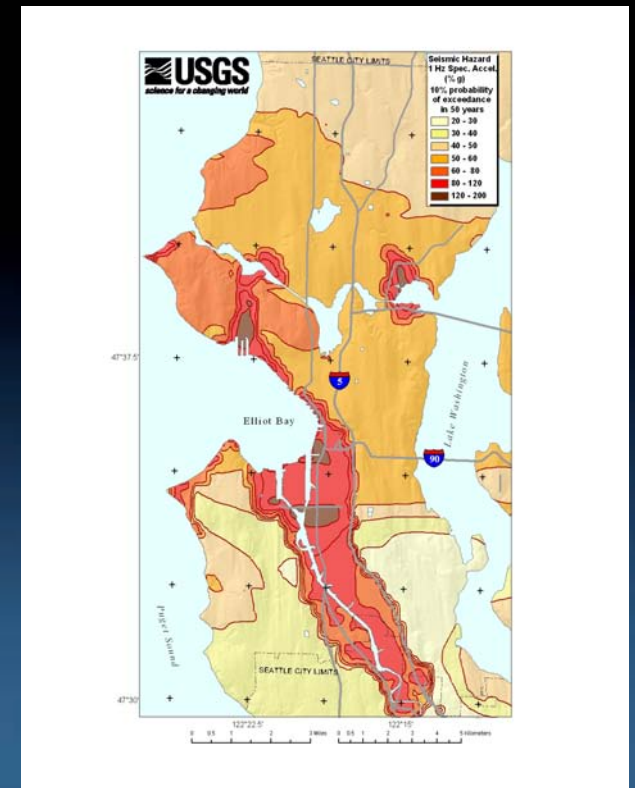
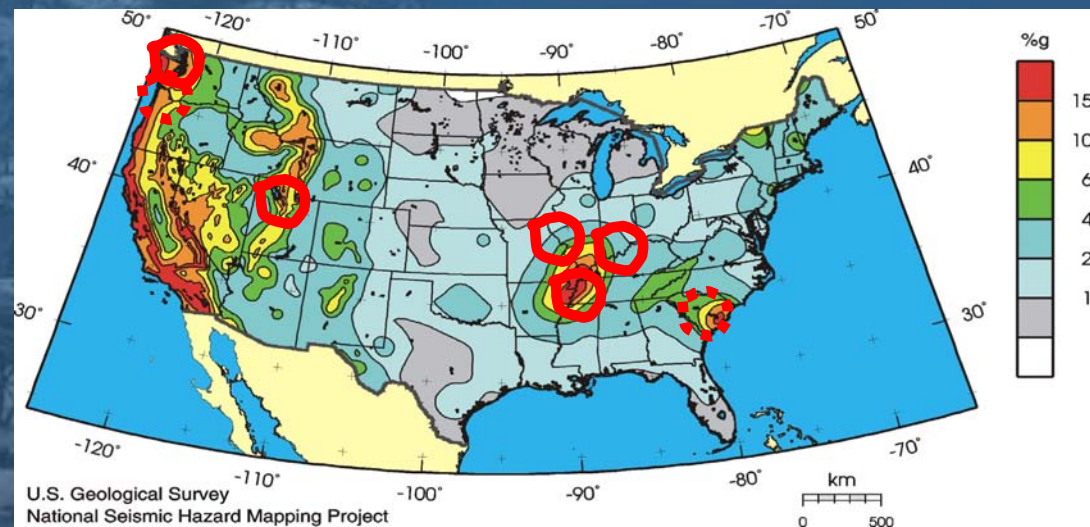


# Urban seismic hazard maps

Recently completed Seattle & Memphis

Underway in St. Louis, Evansville, & Salt Lake regions;

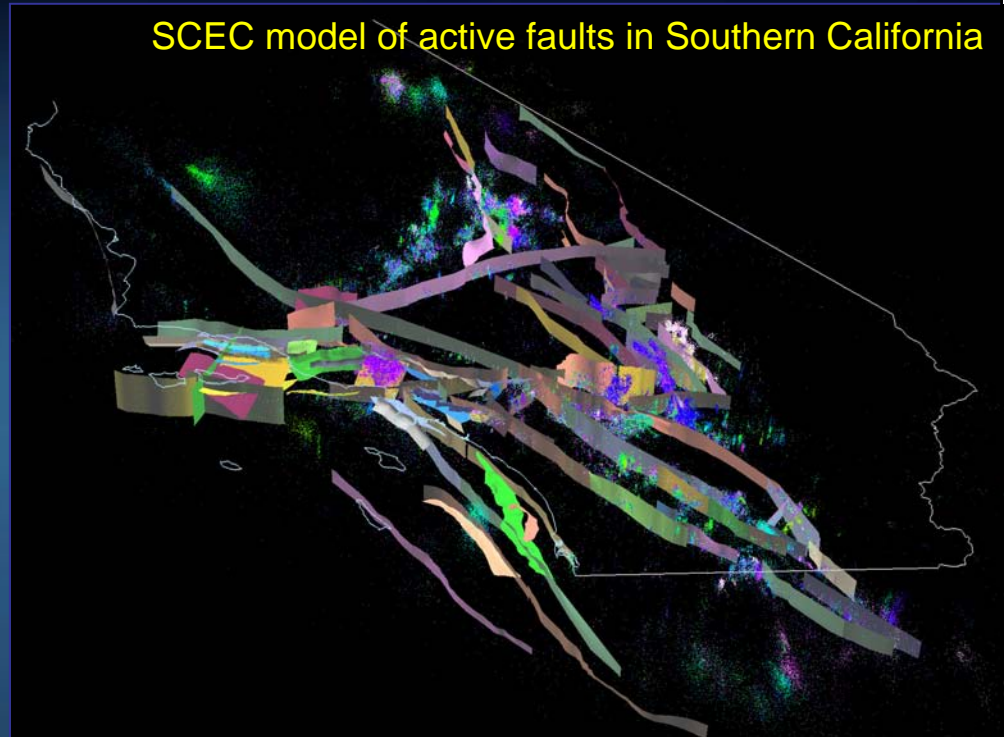
Projected for Portland and Charleston.



# External grants and cooperative agreements are a key component of the Earthquake Hazards Program

- Approximately 25% of core program funds (just over \$12M in FY06)
- Gives flexibility and adds breadth of expertise to program
- Leverages support from other state and federal agencies, and universities

SCEC model of active faults in Southern California





# FY06 External grants and cooperative agreements

- **“NEHRP” Grants** allow independence of investigators
  - 94 one-year grants and 5 two-year grants for a total of \$4.6M
- **Cooperative Agreements** are used when USGS will have substantive involvement during investigations or network operations
  - 18 regional seismic networks funded with a combination of base program and ANSS funds (\$5.9M)
  - 7 geodetic monitoring operations (\$0.5M)
  - 15 unsolicited proposals (\$1.8M) including
    - **Southern California Earthquake Center** (\$1.1M; jointly funded with NSF)
    - CalTech, UC Berkeley, & USC for testing of **earthquake early warning** algorithms



# 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**

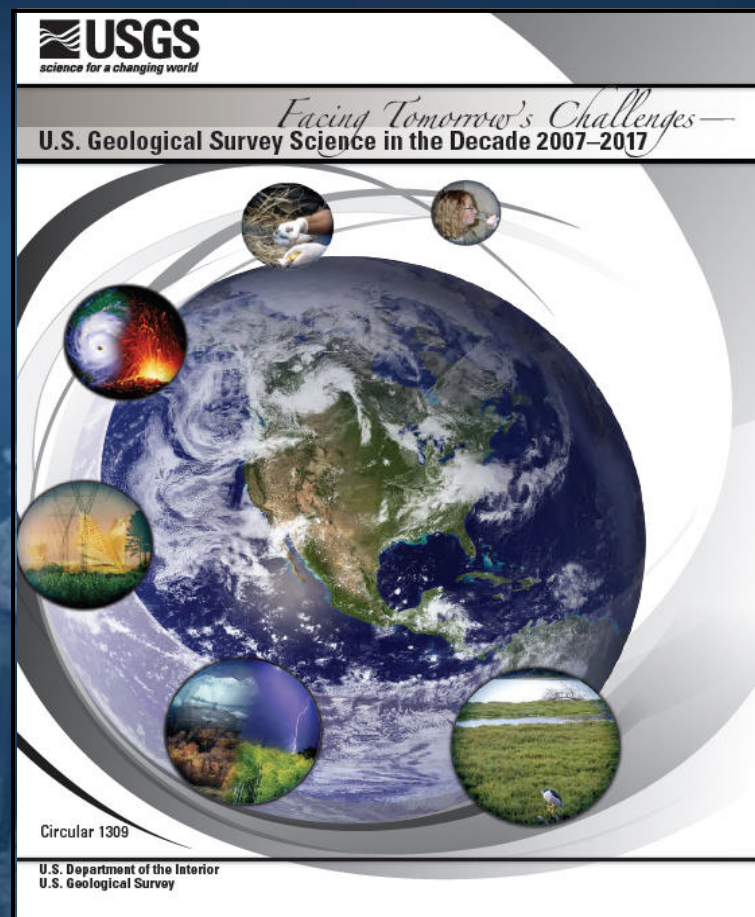


The Role of Environment and  
Wildlife in Human Health



A Water Census of the United States

**USGS**





# Strategy identifies five areas for USGS to focus hazards efforts in the next decade:

## –Robust monitoring infrastructure

- calls out ANSS, NVEWS, stream gauges, Marsh Surface Elevation Table Network, and LiDAR

## –Technology for network communications

## –Characterizing and assessing hazards

- expand urban hazard mapping and incorporate vulnerability to deliver risk assessment

## –Improved forecasting capability based on understanding physical processes

## –Partnerships

