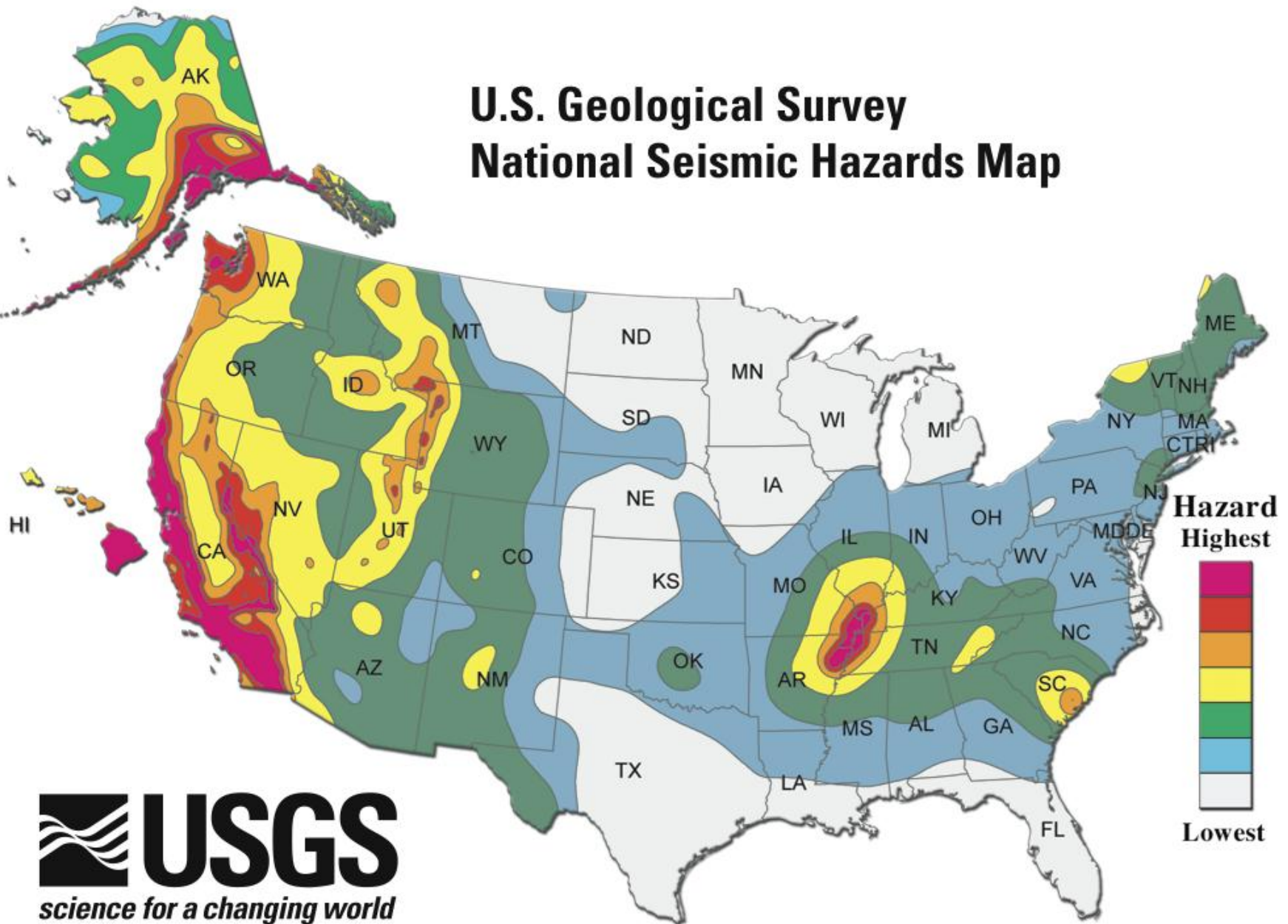


Rapid Earthquake Information: Citizen Science and New Tools for Emergency Response

David Wald, U.S. Geological Survey

U.S. Geological Survey National Seismic Hazards Map



Recent and Potential Earthquake Losses

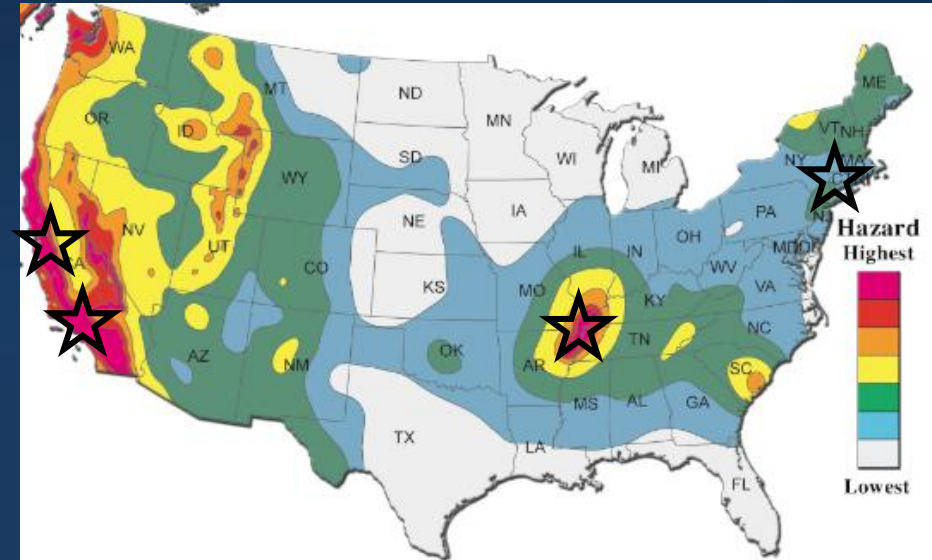
Earthquakes ★ Floods ★ Hurricanes ★ Landslides ★ Tsunamis ★ Volcanoes ★ Wildfires

Recent Impact:

- 1994 moderate-sized magnitude 6.7 Northridge, Calif., killed 57, injured 9,000, and displaced over 20,000 people. Cost: \$40B

Potential Impacts:

- A repeat of historic earthquakes, such as the magnitude 7.7 1906 San Francisco, CA or the 1811-1812 New Madrid, MO earthquakes, could cause up to 1/4 **trillion** dollars
- Losses for a major earthquake in Los Angeles could cost up to \$1/4 trillion and cause 3,000–18,000 fatalities.
- Losses for even a moderate-sized magnitude 6 earthquake in New York City could be on the order of \$100 billion.
- Annual earthquake losses in the U.S. will average about \$5.6 billion/year.



ShakeMap

Rapid, Automatic Maps of
Shaking Distribution and Intensity

1994 Northridge Earthquake (Magnitude 6.7)

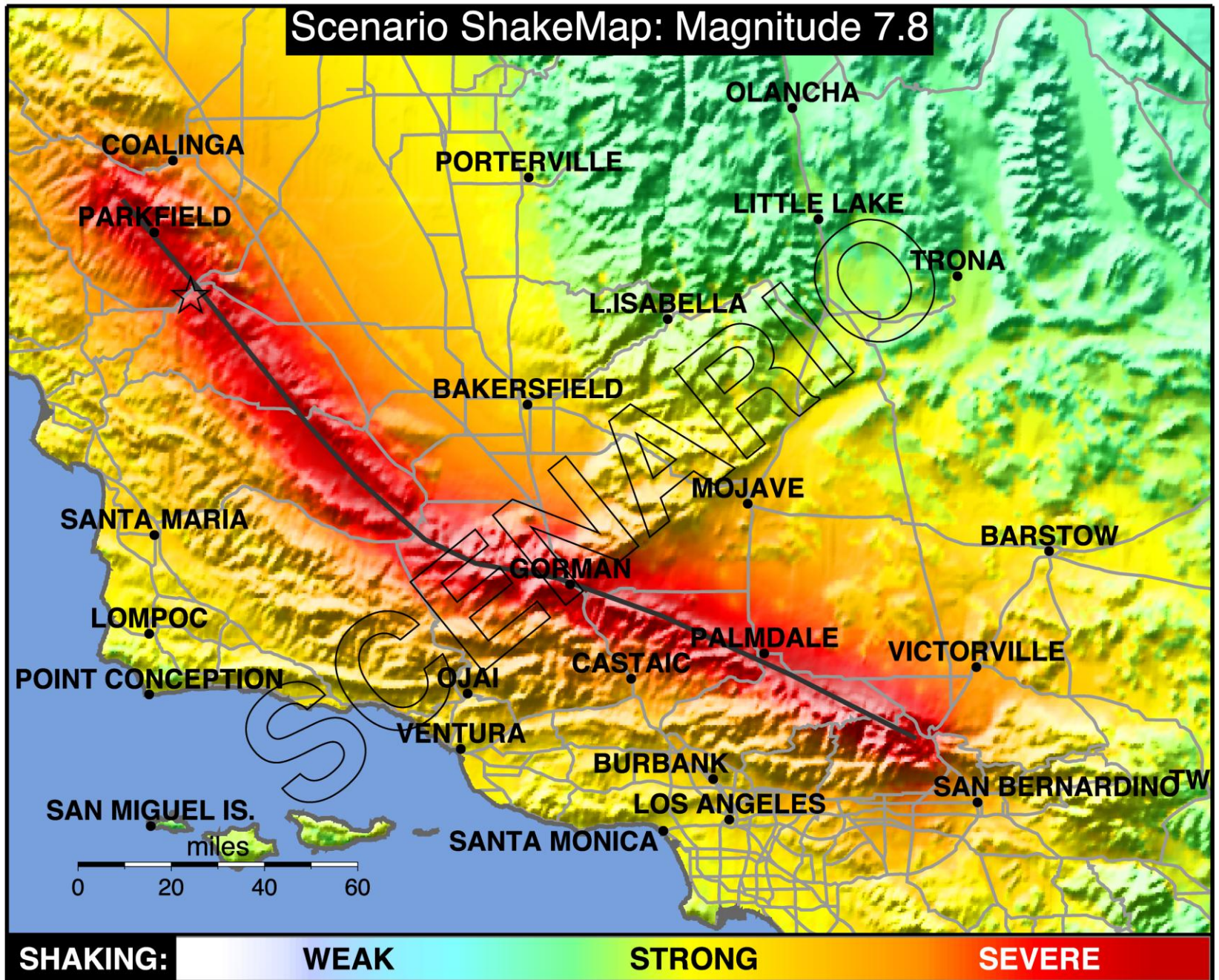


ShakeMap: Northridge (Mag. 6.7)

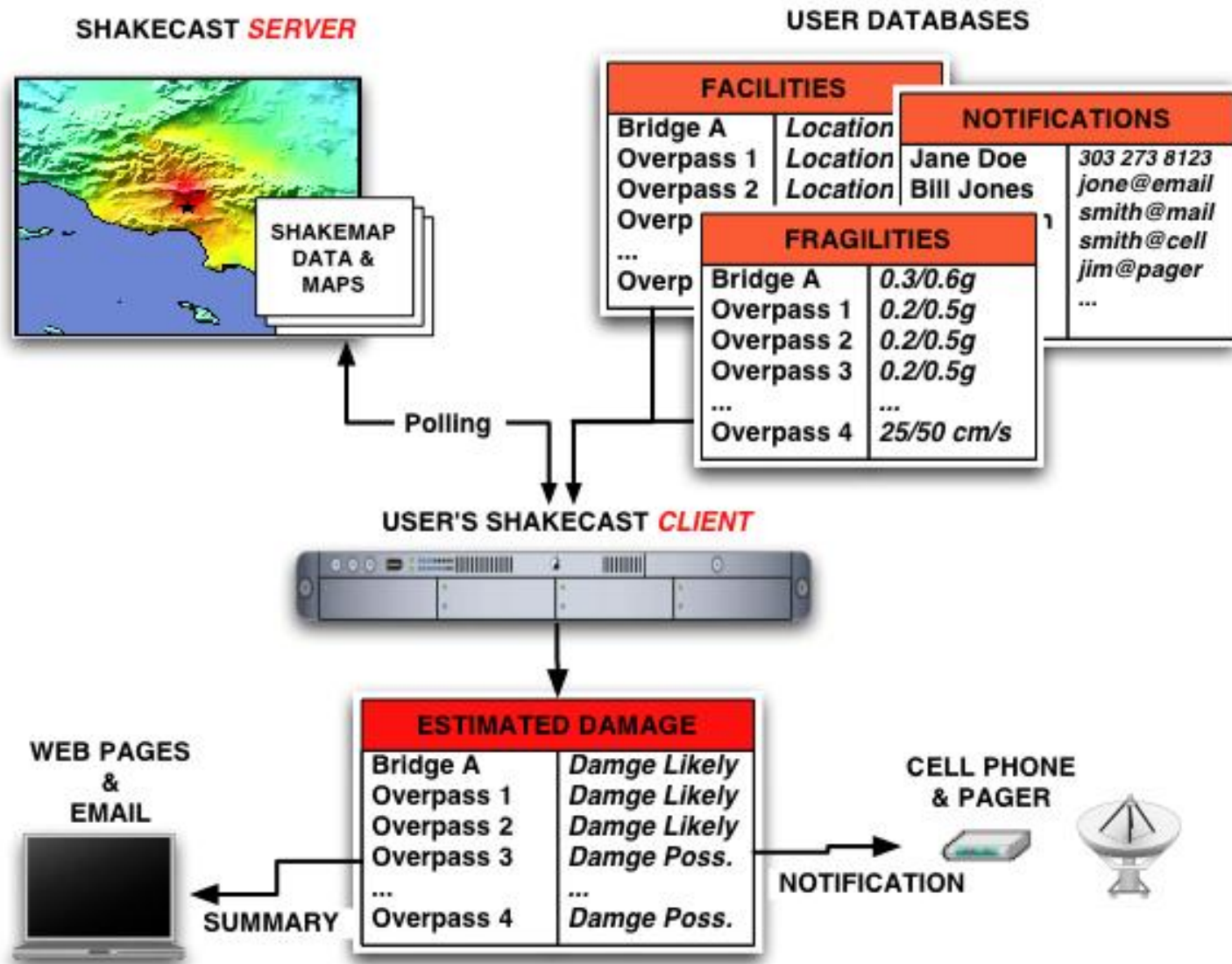


INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy

Scenario ShakeMap: Magnitude 7.8



Simplified ShakeMap/ShakeCast Flowchart



Sample ShakeCast/ShakeMap Critical Users

Earthquakes



Floods



Hurricanes



Landslides



Tsunamis



Volcanoes



Wildfires

California Department of Transportation (Caltrans)

Responsible for 25,000 overpasses & bridges

Inspection, Engineering, & Traffic Management

Pacific Gas & Electric (PG&E)

Electric Substations

Gas pipelines statewide

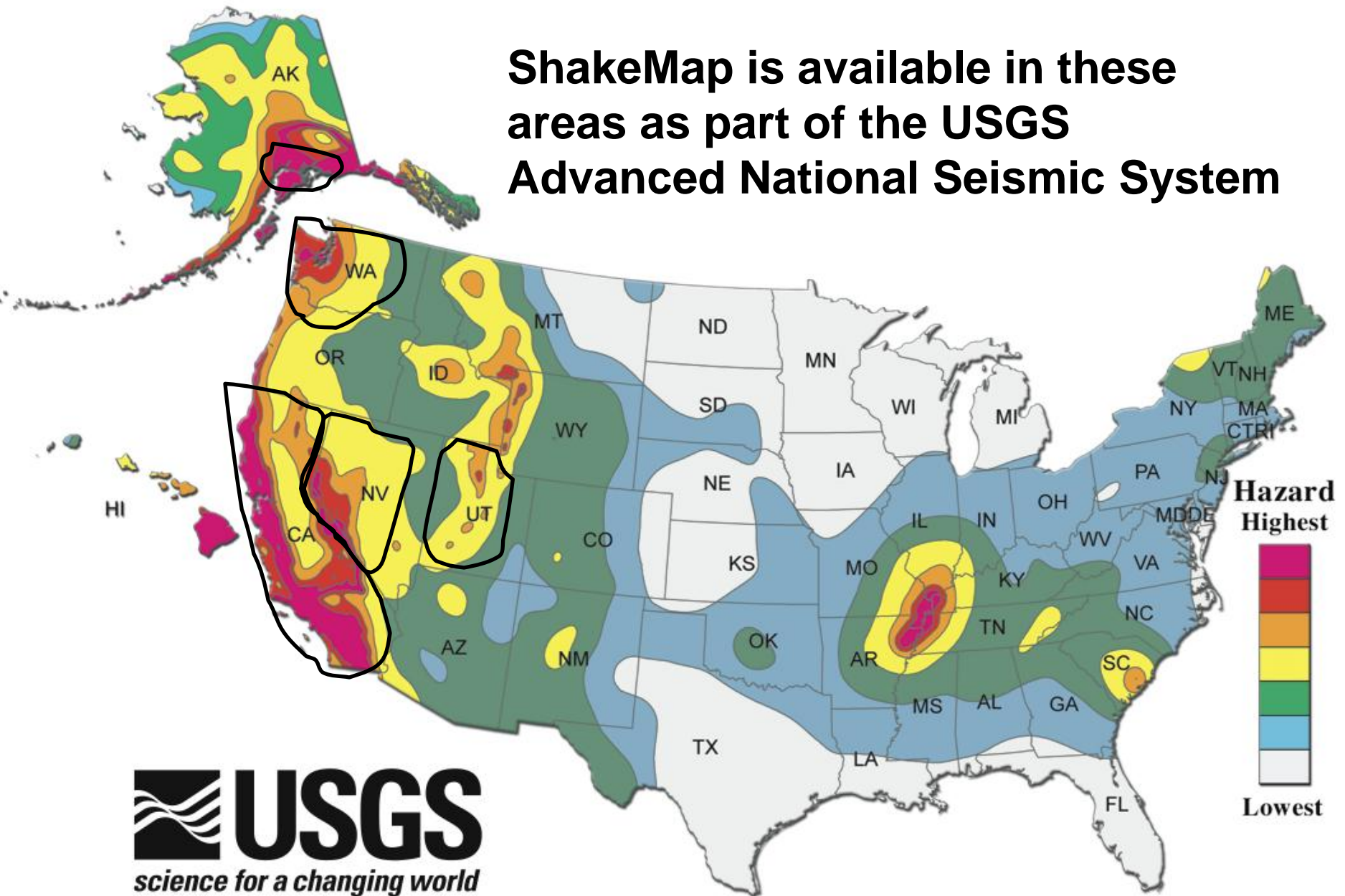
California Dept of Water Resources, Div. of Safety of Dams

Over 1,200 dams statewide.

Los Angeles County Dept of Public Works

Roads, bridges, airports, water supply, flood control, etc.

ShakeMap is available in these areas as part of the USGS Advanced National Seismic System



Citizen Science

“Did You Feel It?”

USGS
science for a changing world

Earthquake Hazards Program


Latest Quakes | EQ Facts & Lists | Hazards & Mitigation

HOME | ABOUT US | EQ GLOSSARY | FOR


Welcome to the U.S. Geological Survey
Information on worldwide earthquakes and tsunamis
[List of Latest World Earthquakes](#)

Maps of Recent Earthquakes
Click on US or World map for more information


USA (M>1 during past 7 days)
Tue Apr 12 13:00:02 UTC



CONTIGUOUS 48 STATES

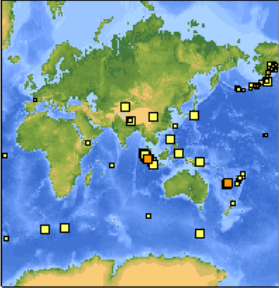


ALASKA



HAWAII

World (M>2.5 during past 7 days)
Tue Apr 12 13:02:25 UTC



Event 14183556 Questionnaire

DID YOU FEEL IT? REPORT IT HERE!

You can help provide information about the extent of shaking and damage for earthquakes in the United States, and you may provide specific details about how your area may respond to future earthquakes.

USGS scientists may use the information you enter in this form to provide qualitative, quantitative, or graphical descriptions of damage in USGS publications. If you would object to this possible usage of your data, please do not fill out this form.

Finally, please consider filling out a questionnaire for other historic events that occurred in your region. After submitting this form, go to the [archives](#) to see other events.

Your ZIP code is REQUIRED! All other identifiers (name, e-mail, phone, and location) are optional, but we need your ZIP code to locate the intensity in your area. The other data may be useful for more accurate location of felt areas.

QUESTIONNAIRE FOR THIS EVENT:

4 miles SSW of Devore, CA
SEP 10 2005 09:19:49 PDT

- Please make sure you are filling out this form for the right event. -

For other events or historic events, or to view other regions, go to the [archives](#). To report an event not yet in our database, go to the [New or unknown event questionnaire](#).

Identifying information (optional):

Name: E-mail:
Phone:

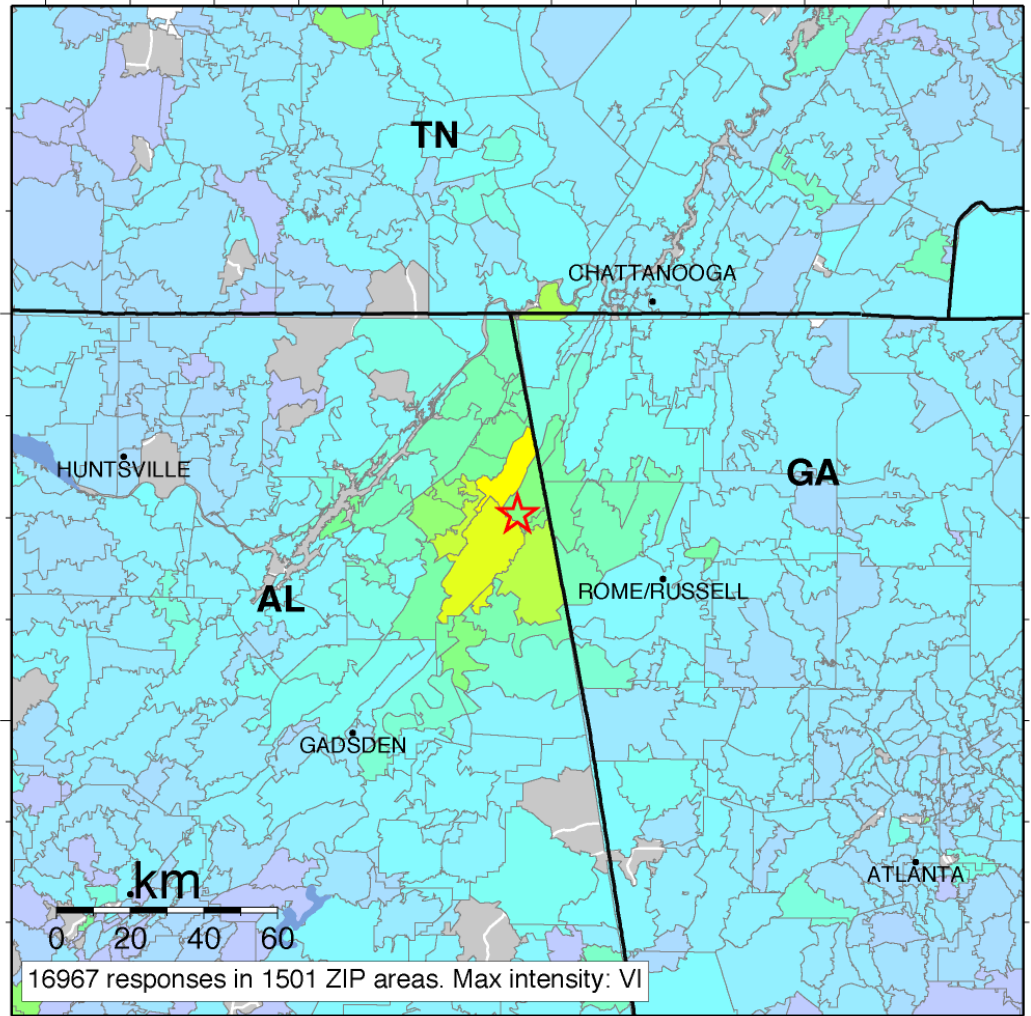
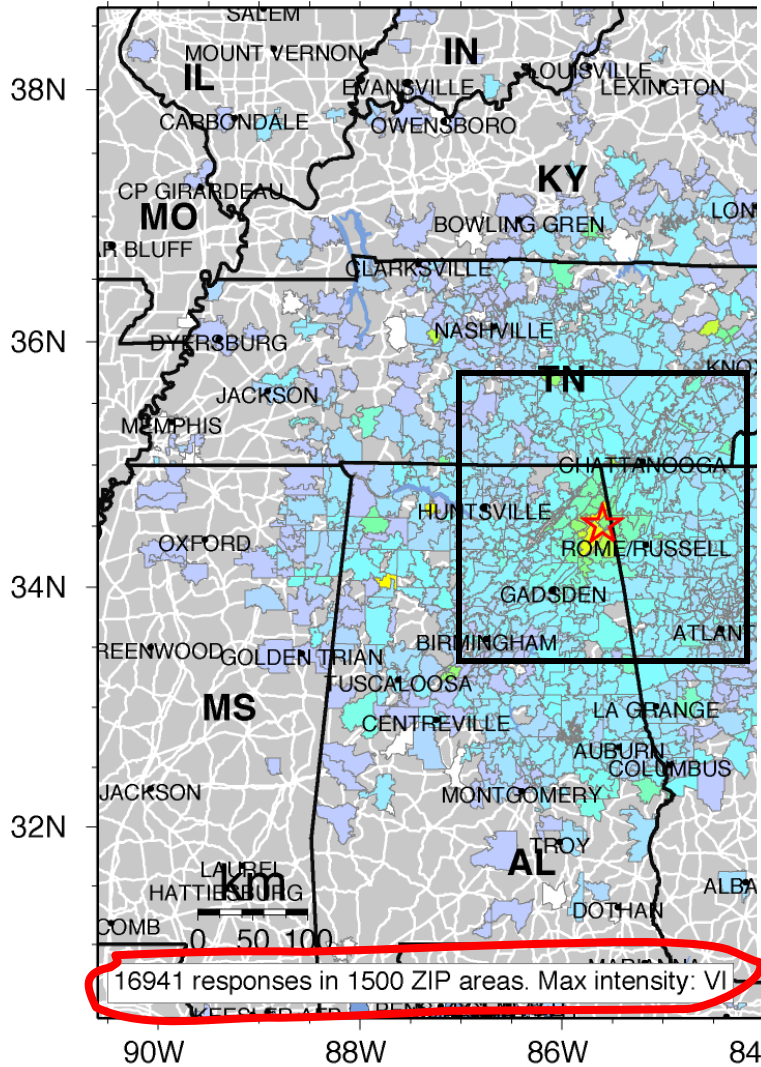
Your location when the earthquake occurred:

Street Address:
Nearest Cross Street:
City:
County:
State/Possession:
Country:
*Zip code:

***A US zip code is REQUIRED** to be on the map. If you don't know your zip code at the time of the earthquake, [look it up](#).
We cannot take Canadian postal codes at this time. If you were in Canada at the time of the event, please go to the [Canadian Geological Survey](#).

Community Internet Intensity Map (8 miles ENE of Fort Payne, Alabama)

ID:teak 03:59:37 CDT APR 29 2003 Mag4.6 Latitude=

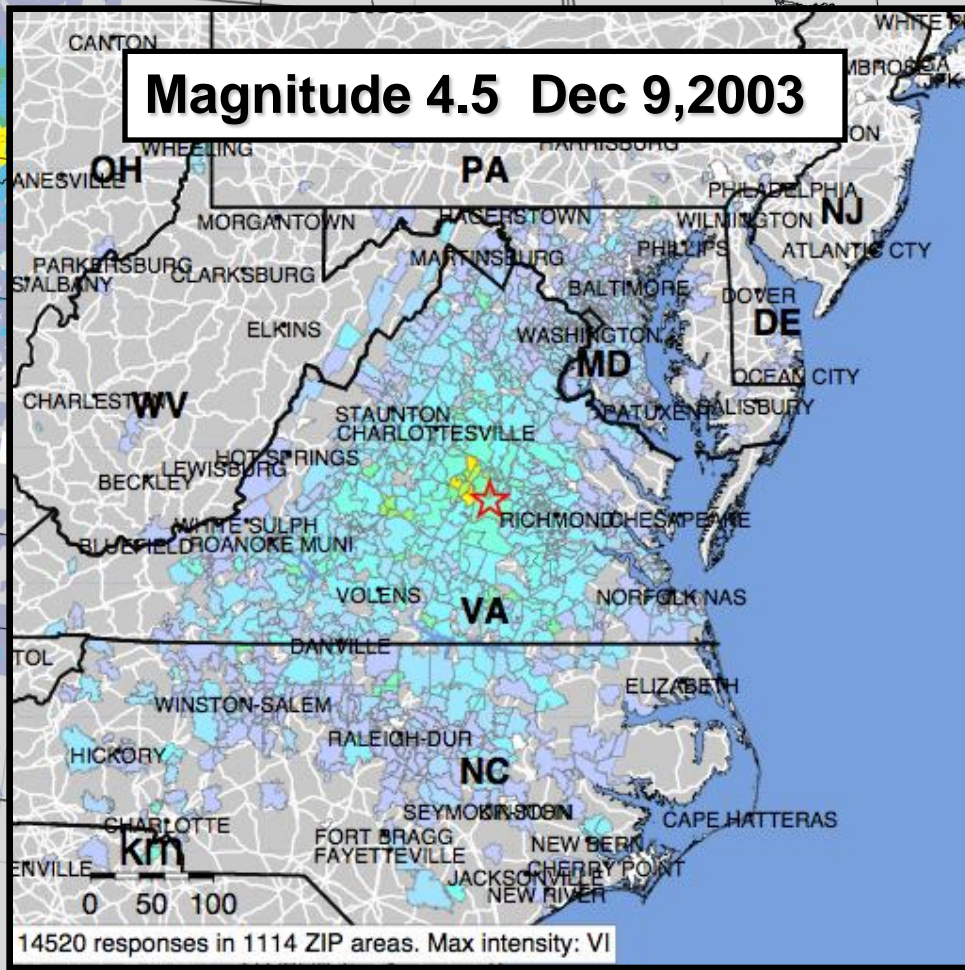


Map last updated on Tue May 6 15:18:32 2003

INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy

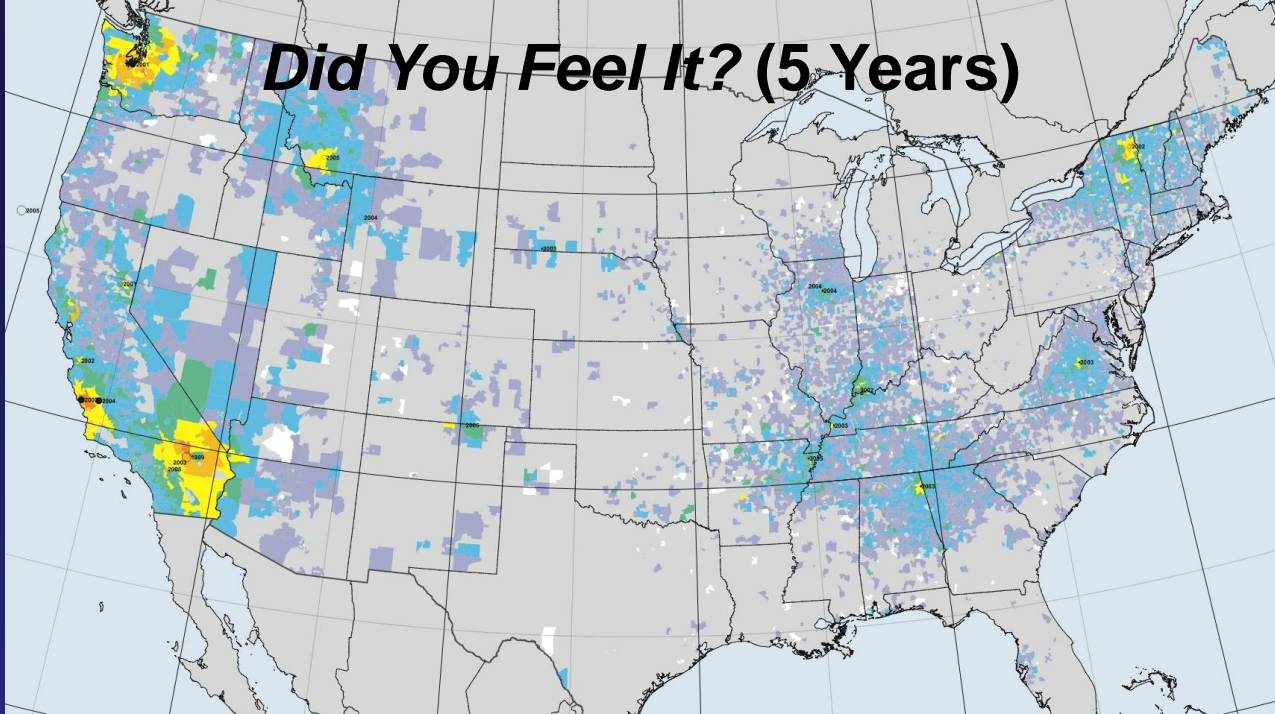
Over 1/2 Million Individual Responses Nationally! (5 Years of *DYFI?* Data)

Magnitude 4.5 Dec 9, 2003

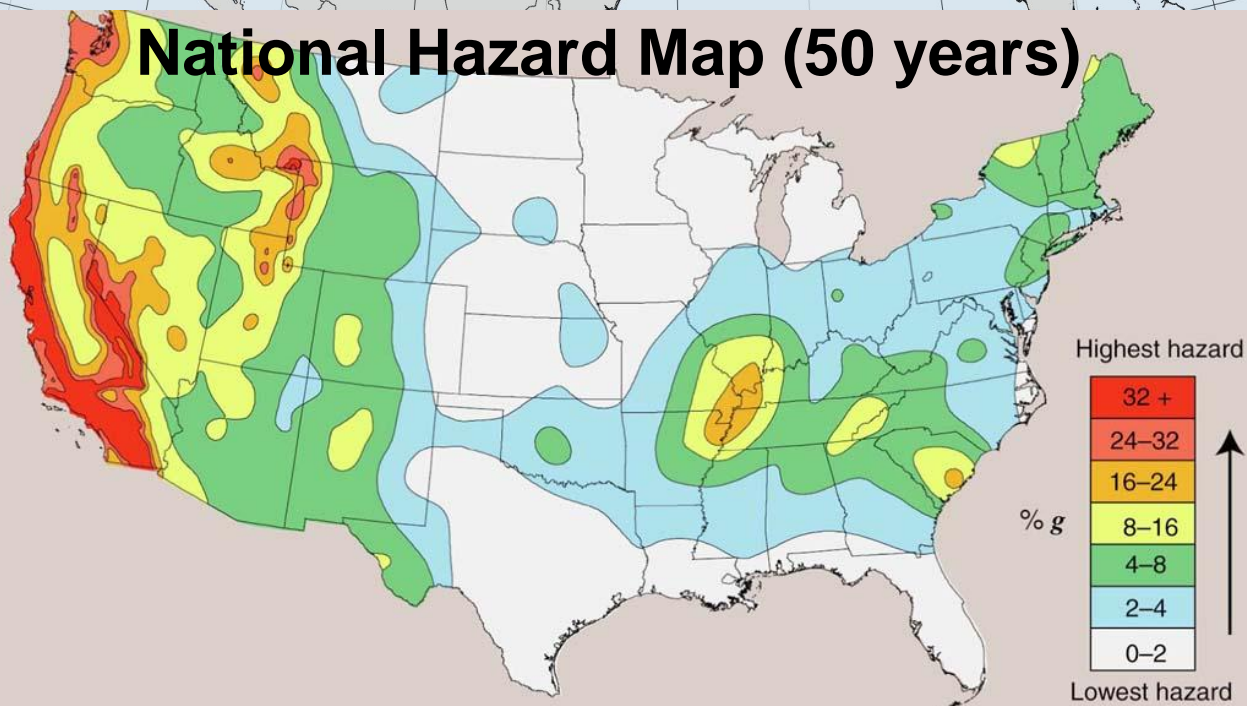


INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy

Did You Feel It? (5 Years)



National Hazard Map (50 years)



Earthquakes



Floods



Hurricanes



Landslides



Tsunamis



Volcanoes



Wildfires

- Rapid *situational awareness* is critical for averting disaster.
- Community understanding of hazards and risk helps for support of mitigation efforts.

<http://earthquake.usgs.gov>



<http://earthquake.usgs.gov>