



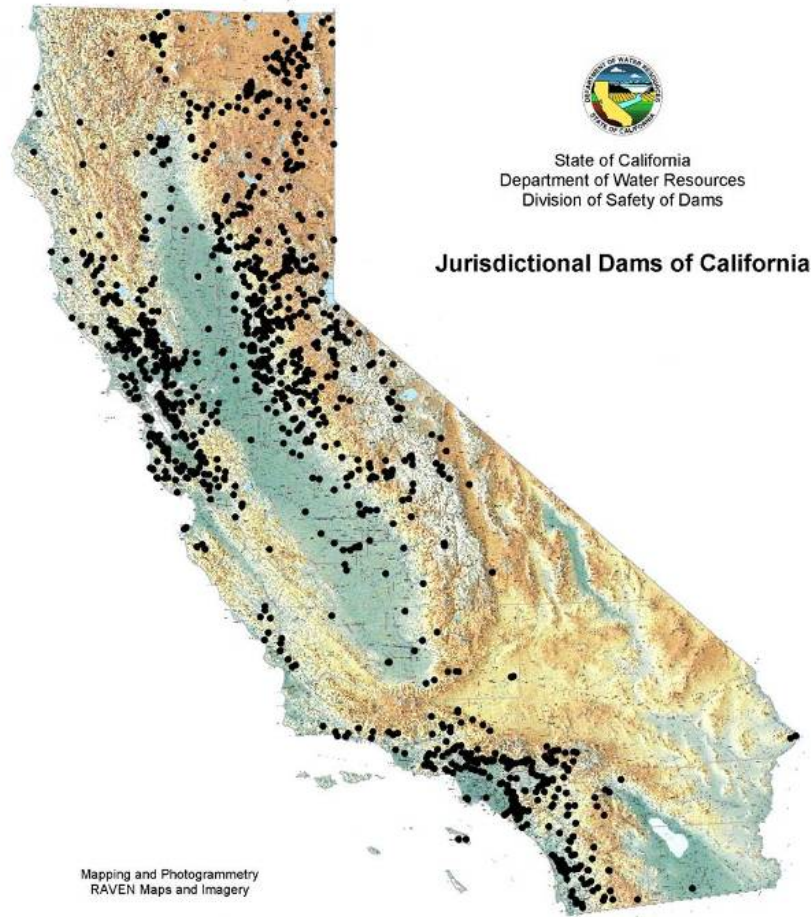
California Dam Safety

David A. Gutierrez, Chief Division of Safety of Dams



January 16-17, 2014 - University of California, Los Angeles

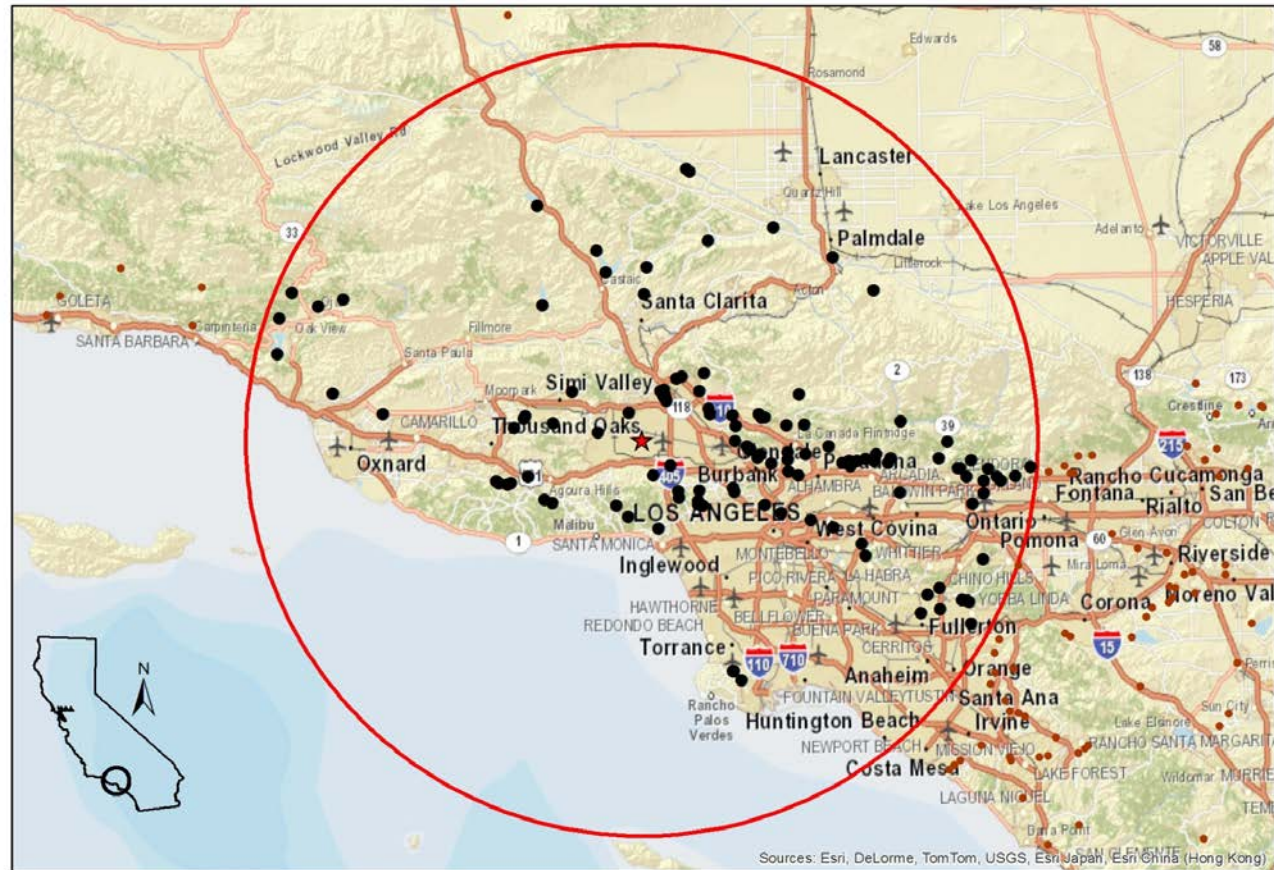
California Division of Safety of Dams (DSOD)



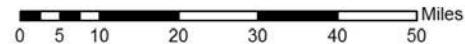
Inspection of Dams

Northridge Earthquake - January 17, 1994, M6.7

Epicenter: 34.213°, -118.537°



EQquake: 50 mile Search Radius



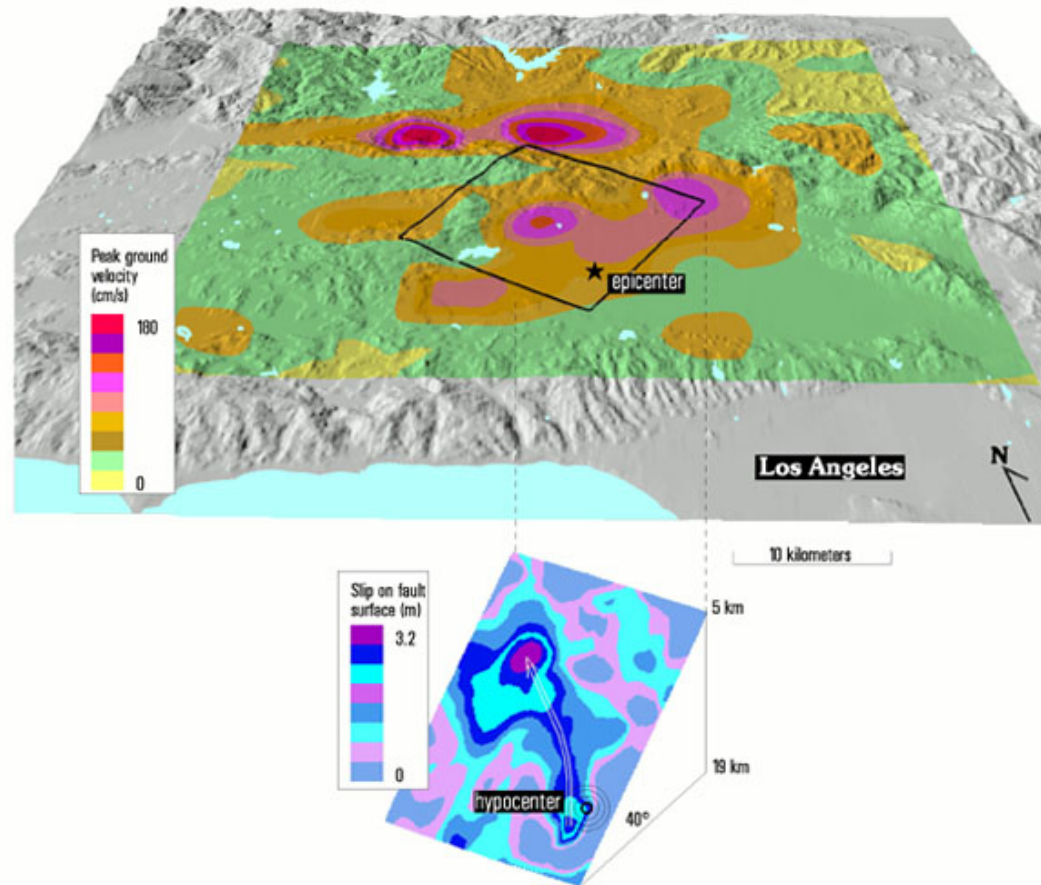
Pacoima Dam



Pacoima Dam



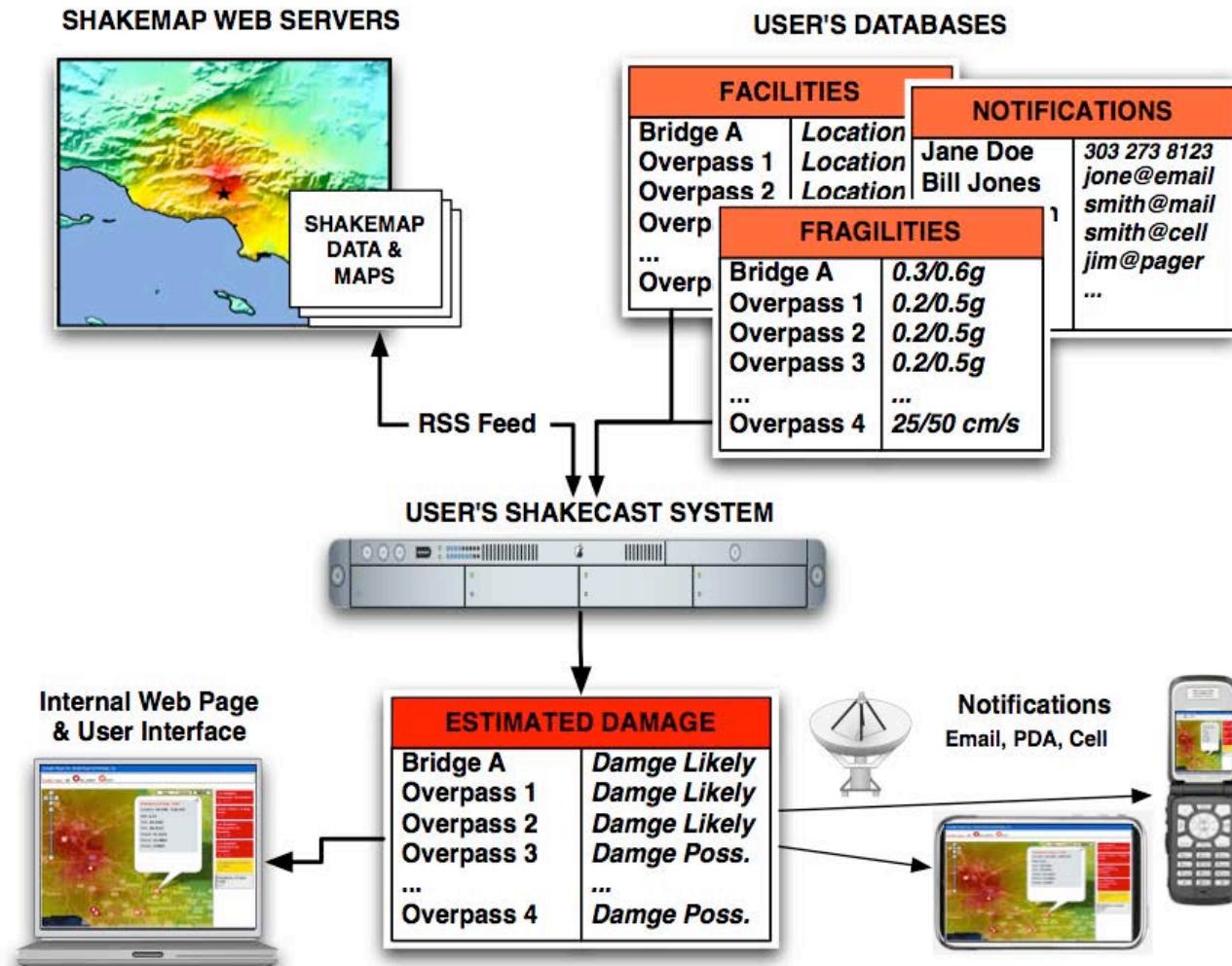
Thrust Faults and the affects to dams



DSOD Seismic Re-evaluation Program

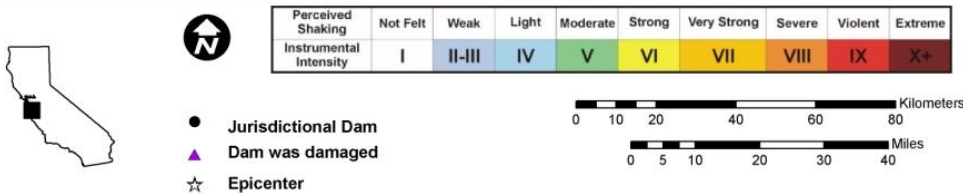
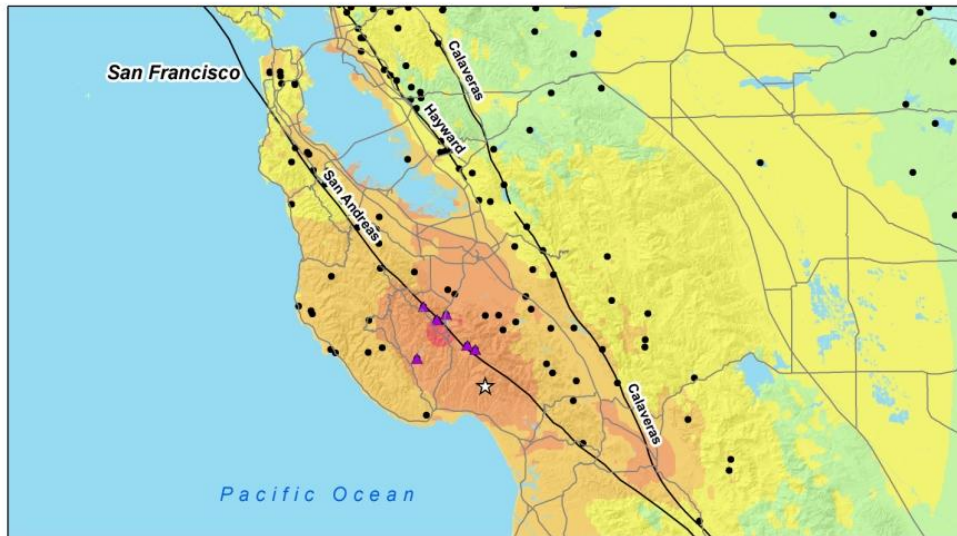


Response to Earthquakes Shakemap and Shakecast



Response to Earthquakes Shakemap and Shakecast

Instrumental Intensity Map for 1989 M6.9 Loma Prieta Earthquake (Modeled)



From: ShakeCast 2.04 (ShakeCast@water.ca.gov)
To: Items Index

Subject: ShakeCast Event 71338066 (res. 18) and Action Summary

ShakeCast Event and Action Summary

Event ID: 71338066
Magnitude 6.5
Event Location: 37.1 km (23.1 mi) WNW of Folsdale, CA
Epicenter: Lat 40.632; Lon -124.6923
Event Time: 2010-01-09 16:27:39 Local

ShakeMap (Unnamed Event) Version 18
Generated at 2010-01-11 08:07:03 UTC
Maximum Instrumental Intensity Reported for a Dam: 6.41

Event-Specific ShakeMap (Select Appropriate Region Below)
Northern California
Southern California
Reported by: Server ID = 1000 at DSOD, DNS = localhost

Follow-Up Action Summary

Number of Dams Reporting Instrumental Intensities 4.5 or Greater: 8

Upon Notification	Within 4 Hours of Notification	Next Day	No Action Necessary
Call Owner Inspection Necessary	Call Owner Inspection Possible	Call Owner No Inspection	No Action Necessary
0 Dams	1 Dams	3 Dams	4 Dams

Facility-Specific Results from ShakeCast

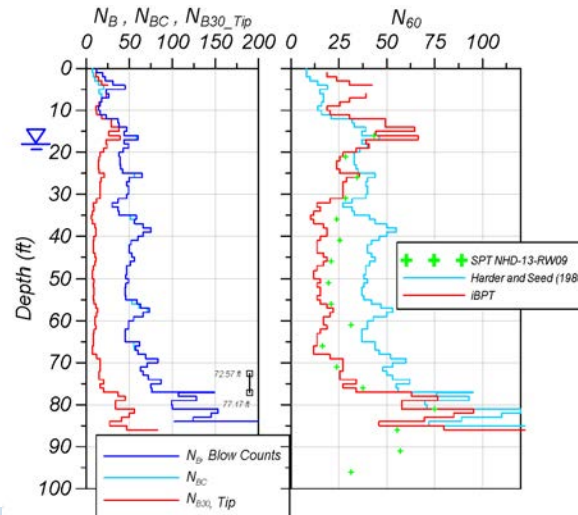
Facility	Facility Information	Guideline	Intensity	Exceedance Ratio
205-0 SCOTIA LOG POND	AREA 1, JUR, EARTH, Humboldt County, Hgt: 240ft, Cap: 2106af, Own: Town of Scotia Company, LLC, Ph: 707-764-4131	Within 3hr Call Owner Post-Inspect	6.41	0.411
27-0 ARCATA	AREA 1, JUR, EARTH, Humboldt County, Hgt: 50ft, Cap: 46af, Own: City Of Arcata, Ph: 707-822-5957	Next Day Call Owner	5.74	0.741
1-41 BENBOW	AREA 1, JUR, SLBT, Humboldt County, Hgt: 440ft, Cap: 1065af, Own: California Department Of Parks & Recreation, Ph: 707-443-6547	Next Day Call Owner	5.01	0.051
203-0 BIG LAGOON	AREA 1, JUR, EARTH, Humboldt County, Hgt: 160ft, Cap: 780af, Own: California Redwood Acquisition Co, Ph: 707-266-3042	Next Day Call Owner	5	0.001
1013-0 ROBERT W MATTHEWS	AREA 1, JUR, EARTH, Trinity County, Hgt: 150ft, Cap: 51800af, Own: Humboldt Bay Mun Water Dist, Ph: 707-443-5018	No Action Necessary	4.85	0.702
219-0 JONES RANCH	AREA 1, JUR, EARTH, Trinity County, Hgt: 360ft, Cap: 58af, Own: Greg Simmons, Ph: 530-629-2770	No Action Necessary	4.81	0.622
2383-0 SCHWINDT	AREA 1, ILL, EARTH, Mendocino County, Hgt: 370ft, Cap: 23af, Own: David P Schwindt, Ph: 707-459-9500	No Action Necessary	4.56	0.122
1072-0 EWING	AREA 1, JUR, ERK, Trinity County, Hgt: 630ft, Cap: 887af, Own: Trinity Co Waterworks Dist 1, Ph: 530-628-5449	No Action Necessary	4.52	0.042

On-going Research

Instrumented Becker Penetration Test (iBPT) for Characterization of Sites w/ Gravelly Soils

- Equipment provides continuous direct measurement of penetration resistance at driving tip (energy and blows per foot).
- Site specific calibration of iBPT N_{b30_tip} to SPT N_{60} values
- Provides improved accuracy and spatial resolution of gravelly soils relative to conventional methods

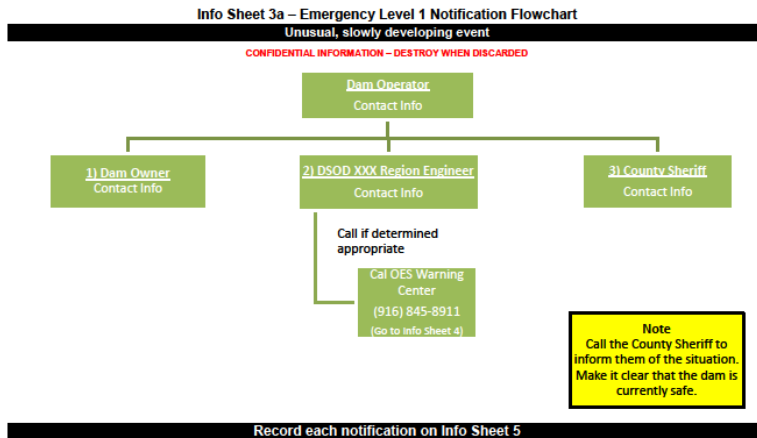
Example iBPT results from field project with LADWP (Craig Davis).



Emergency Action Plans

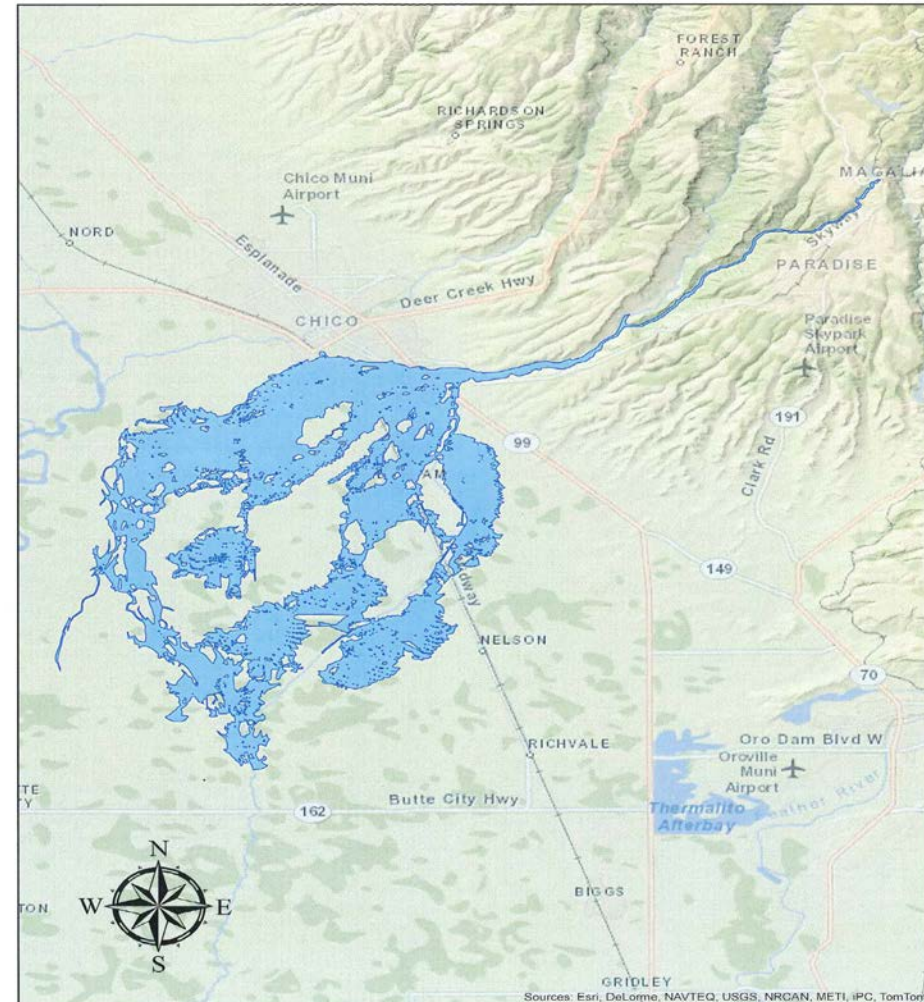
Inundation Maps

Emergency Notification Flow Charts

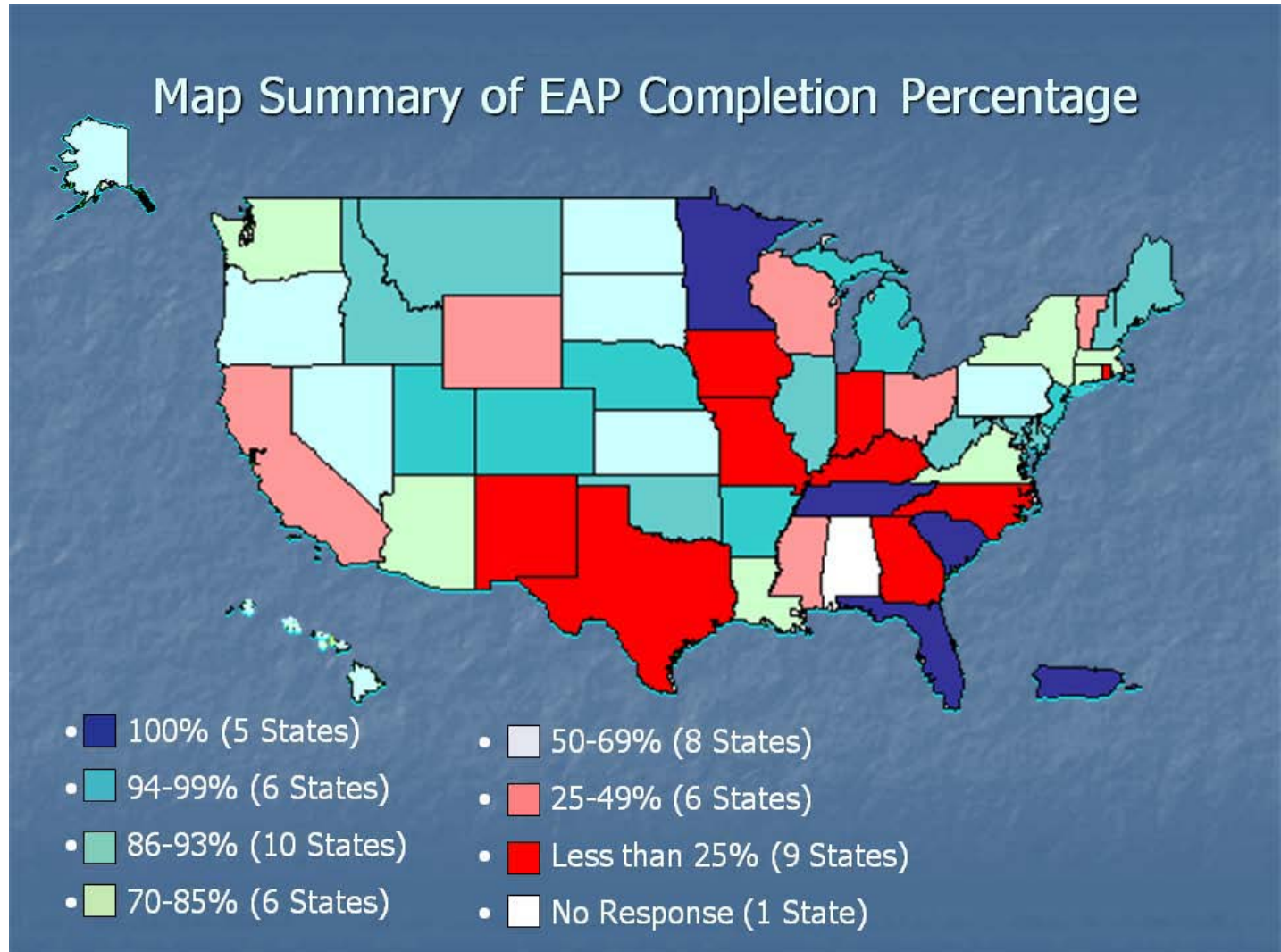


Dam Name, DSOD No. XXXX-XXX, County Name

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Emergency Action Plans



Recommendations to Improve Dam Safety

- Additional Research to improve understanding of dam behavior during earthquakes
 - Understanding liquefaction
 - Understanding non-linear behavior of Concrete Dams
- Development of Emergency Action Plans
- Authorization of a Dam Rehabilitation Act