

# CENTER FOR EARTHQUAKE RESEARCH AND INFORMATION UNIVERSITY OF MEMPHIS

CHUCK LANGSTON, DIRECTOR

NOVEMBER 4, 2019 NETOPS MEETING



- ◆ *State Agency*
- ◆ *Research “Project” at University of Memphis*
- ◆ *Research/Education/Outreach*

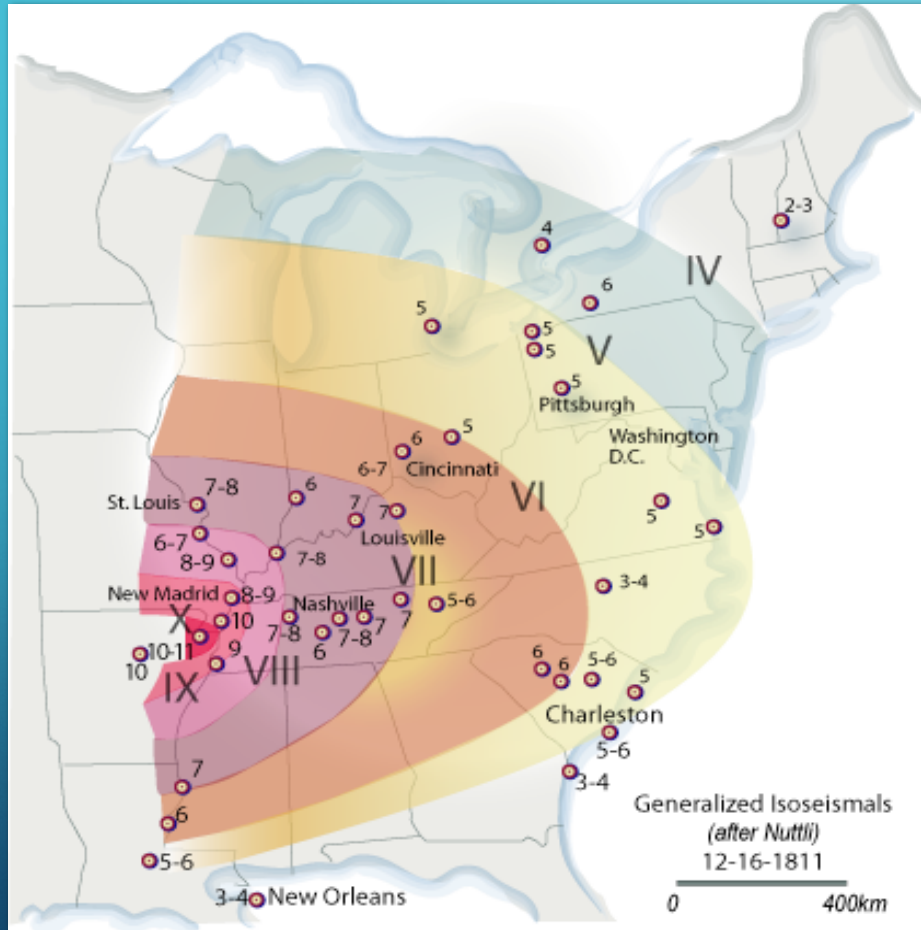
- Tennessee Earthquake Information Center 1977 - 1984 (State Agency)
- Tennessee Center of Excellence 1984
- “Accomplished Center” 1988
- Reauthorized under TN Sunset Law March 2016 for 6 years
- SCEC Board Member 2019



## **TCA 49-8-602: Center for Earthquake Research and Information.**

- (a) There is established the Tennessee Center for Earthquake Research and Information, which shall operate as a division of the University of Memphis, to provide services such as the following:
  - (1) Accurate, immediate reports for individuals, governmental agencies and the news media on the occurrence of earthquakes;
  - (2) Background information on earthquakes for individuals, civic groups, schools, governmental agencies, the news media and others.
  - (3) Research related to the causes and consequences of local earthquakes, to develop the information as the precise locations of earthquakes, magnitude-frequency relationships, magnitude-duration relationships, source spectra studies, attenuation studies, bedrock structures studies and behavior of foundation materials studies.
  - (4) Studies of the desirability of earthquake resistant construction.
  - (5) Advice to governmental bodies, insurance groups and others on the methods and feasibility of reducing earthquake damage; and
  - (6) Earthquake prediction.
- (b) The university is authorized to accept for the establishment, maintenance or operation of the center gifts, grants, funds and other assistance from any agency of state, federal or local governments, or private entities and individuals, and to use or spend the same on behalf of the center.

# 200 Years Ago



N. Kent Moran  
T. Broadbent Graphic

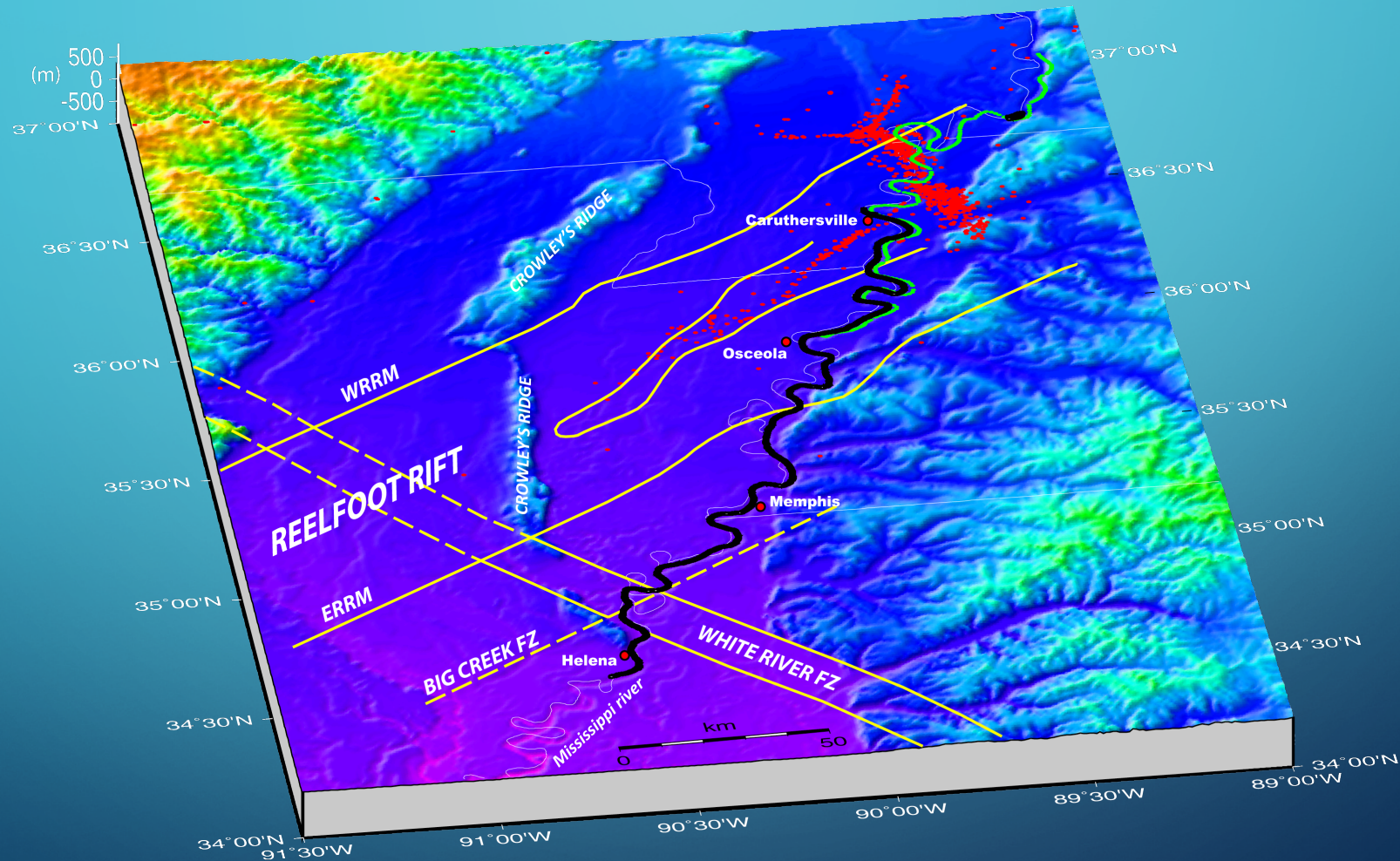
Johnston  
and  
Schweig  
1996

16 Dec 1811	7.9
	6.2
	5.8
	7.4
	6.0
17 Dec 1811	7.0
16 Jan 1812	5.8
23 Jan 1812	7.6
27 Jan 1812	5.8
04 Feb 1812	5.8
07 Feb 1812	8.0
	5.8
	7.0
10 Feb 1812	6.2
11 Feb 1812	6.2



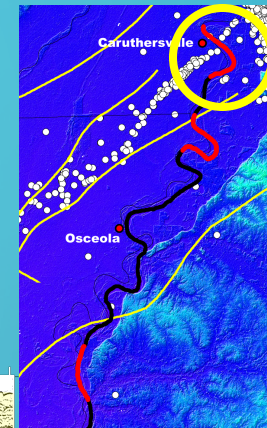
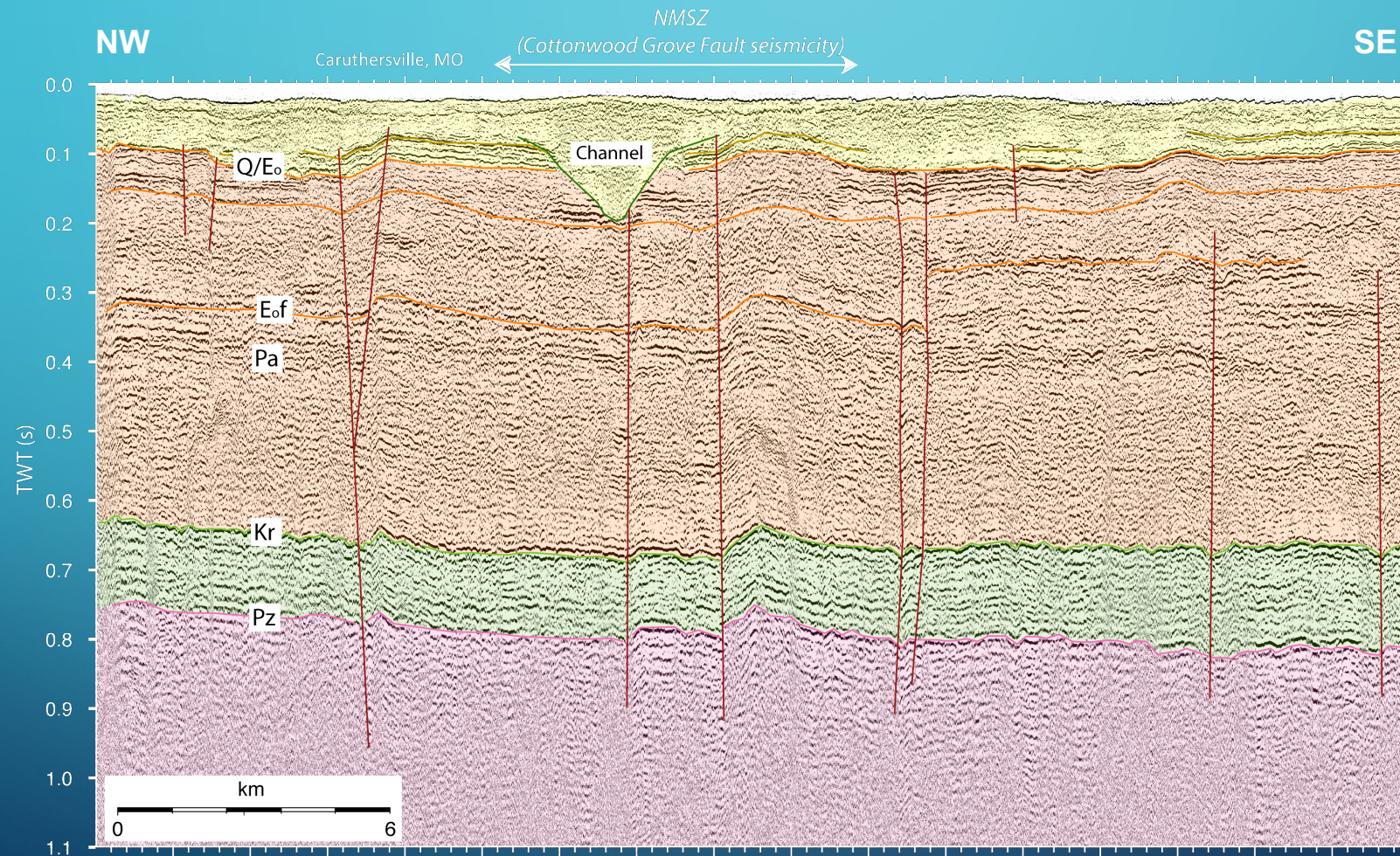
# The Mississippi river project – 2008

## Facilitated by USACE



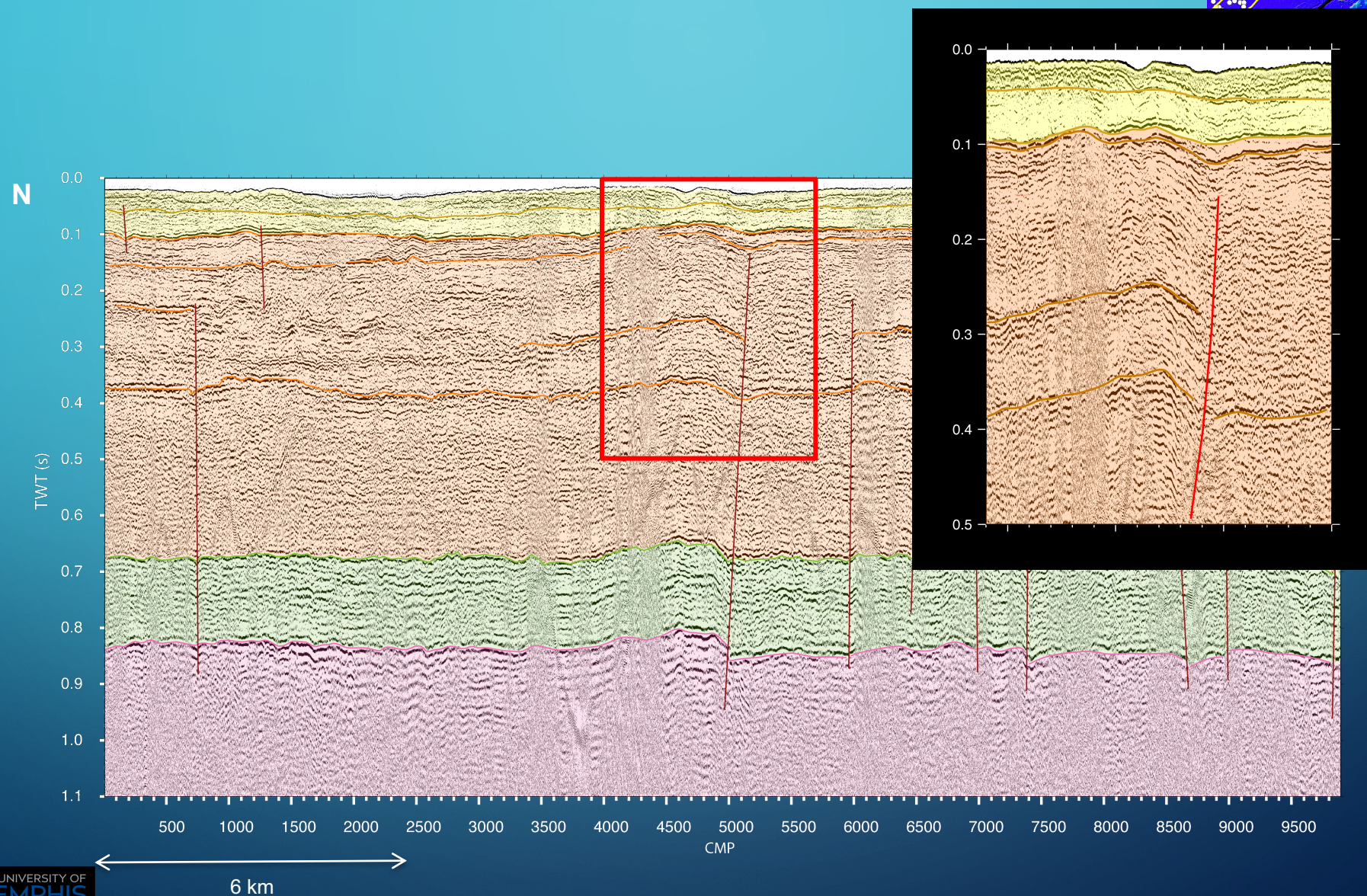
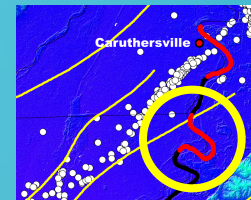


# The river across the NM seismic zone





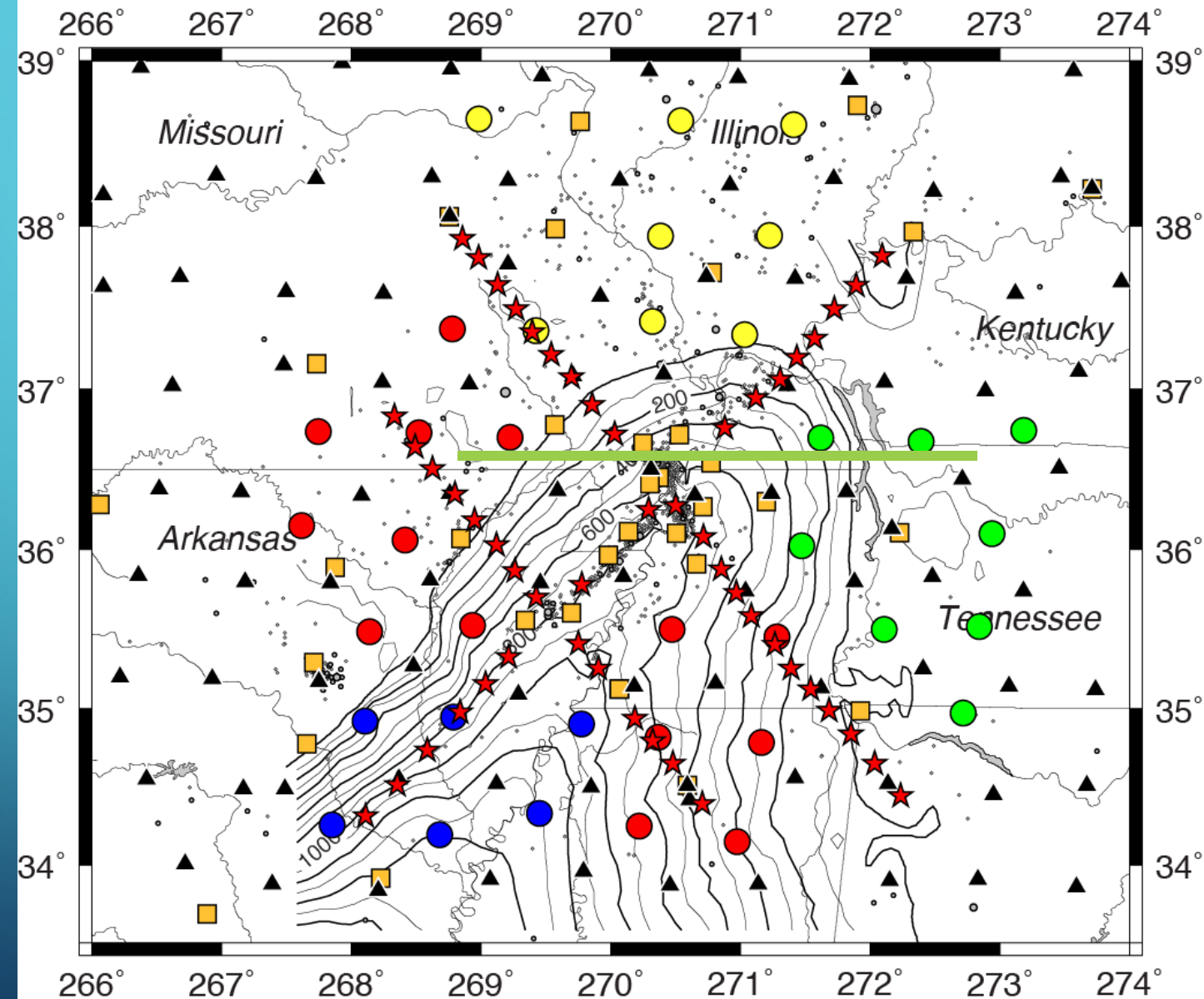
# RECENT DEFORMATION OUTSIDE THE NMSZ



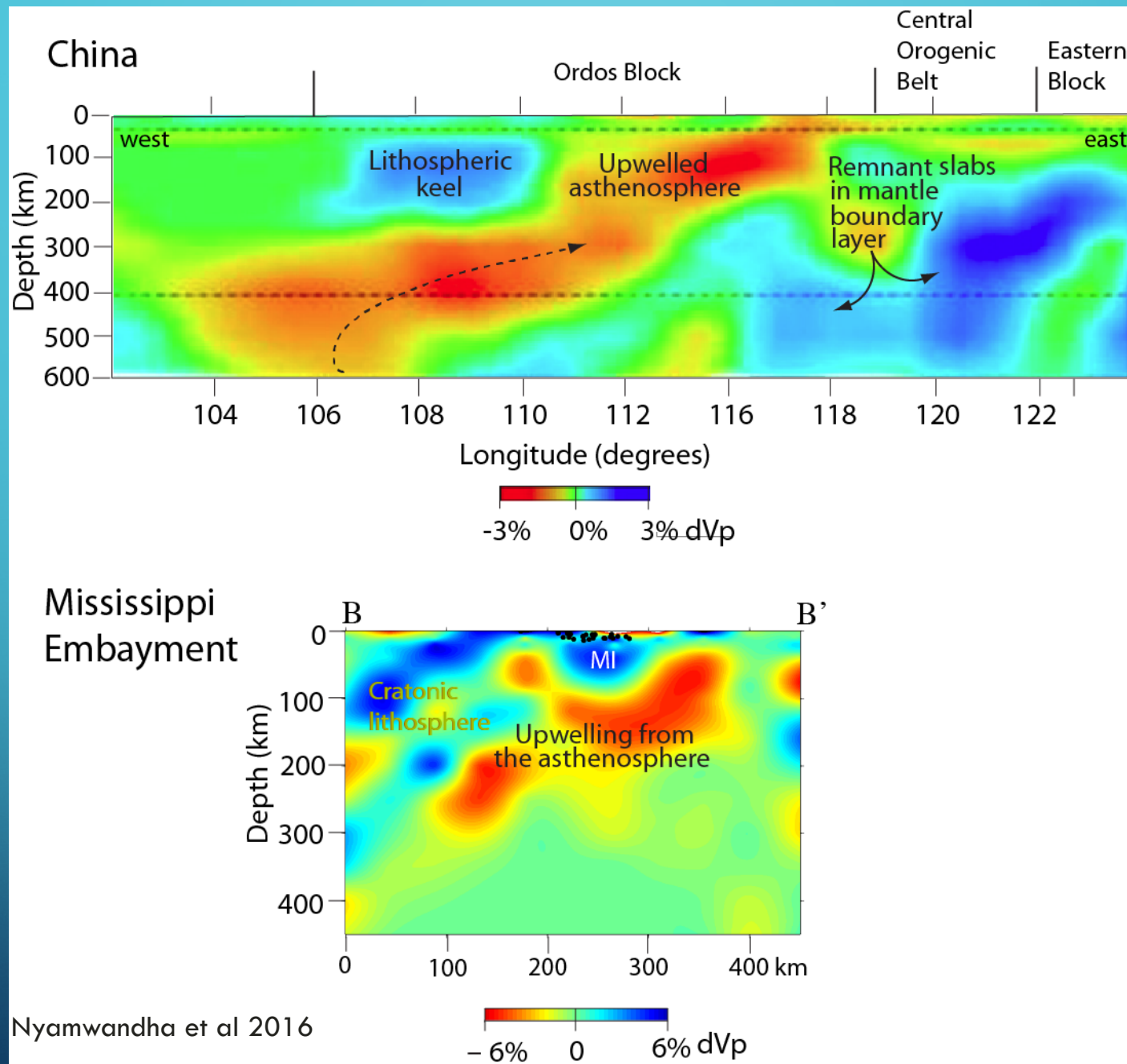


# Northern Embayment Lithosphere Experiment 2011-2015

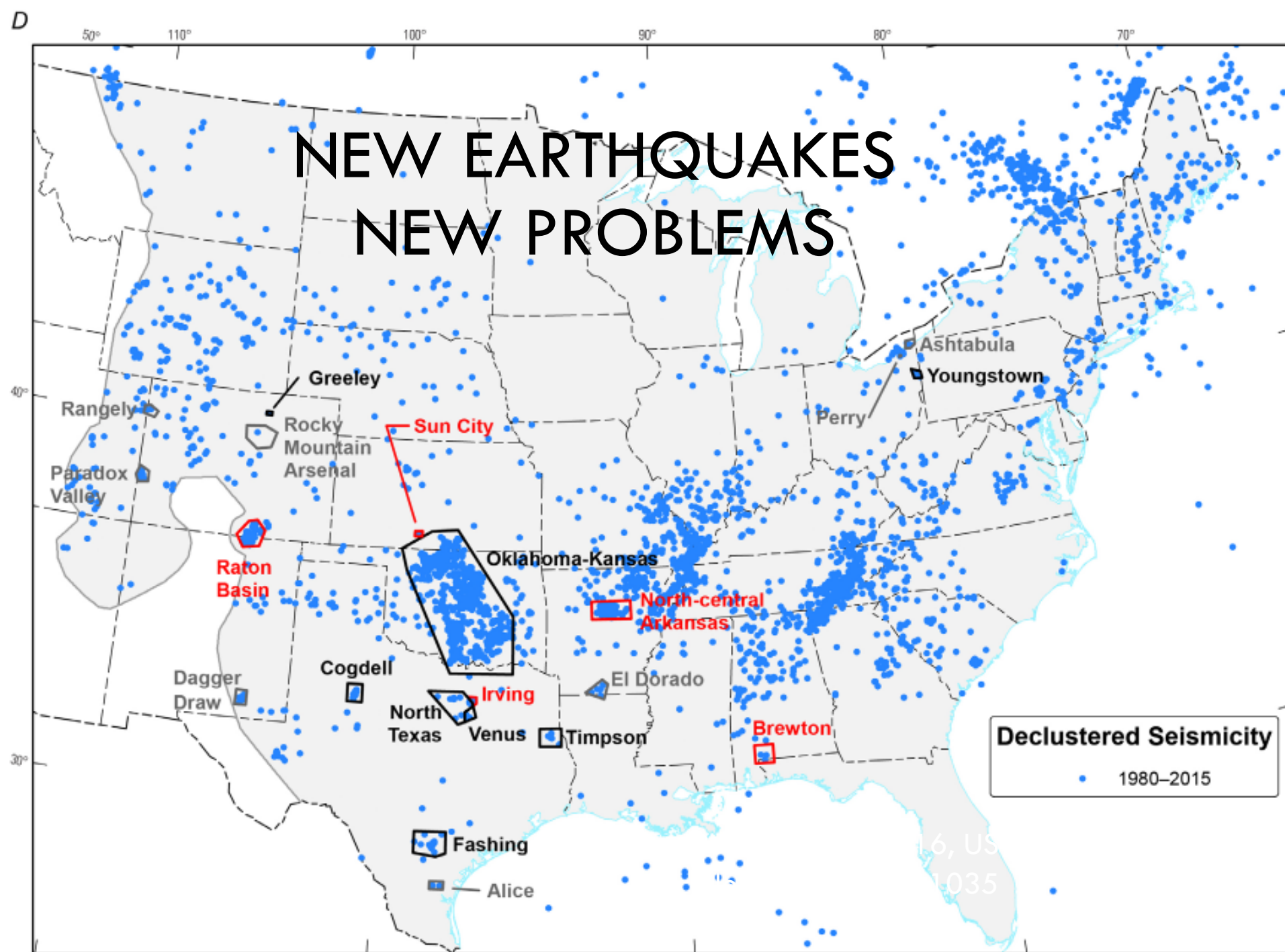
- University of Memphis
- Saint Louis University
- Penn State University
- University of Kentucky



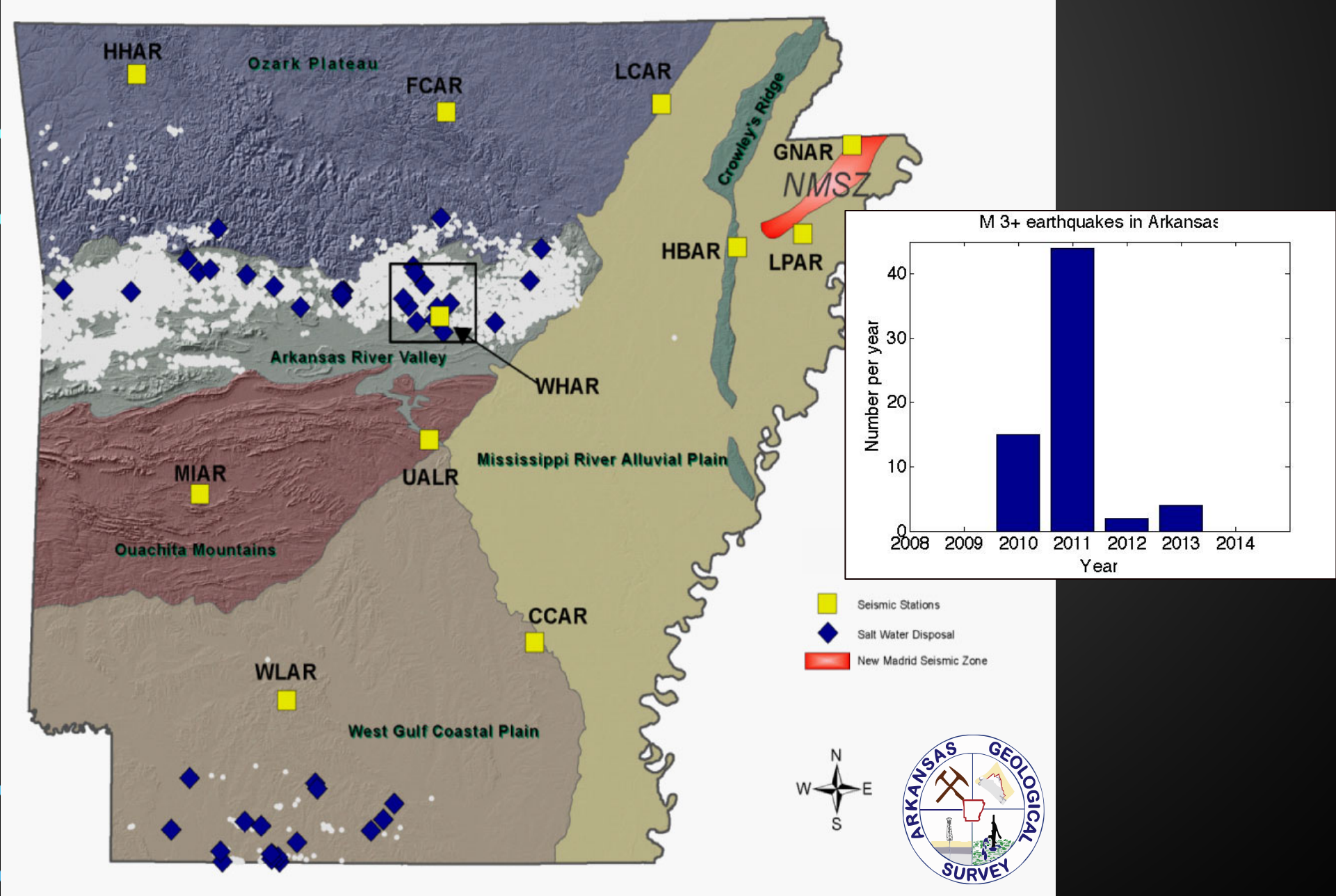




# NEW EARTHQUAKES NEW PROBLEMS

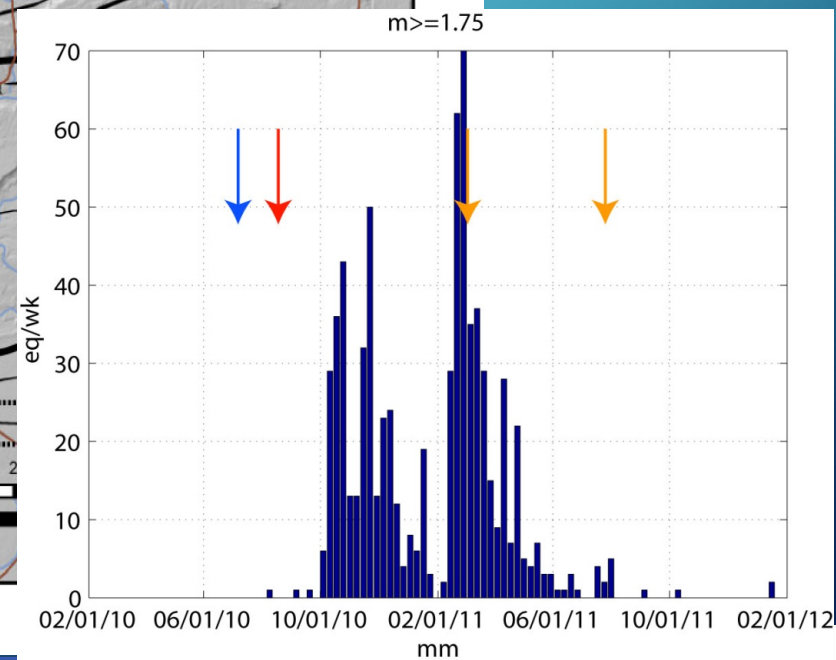
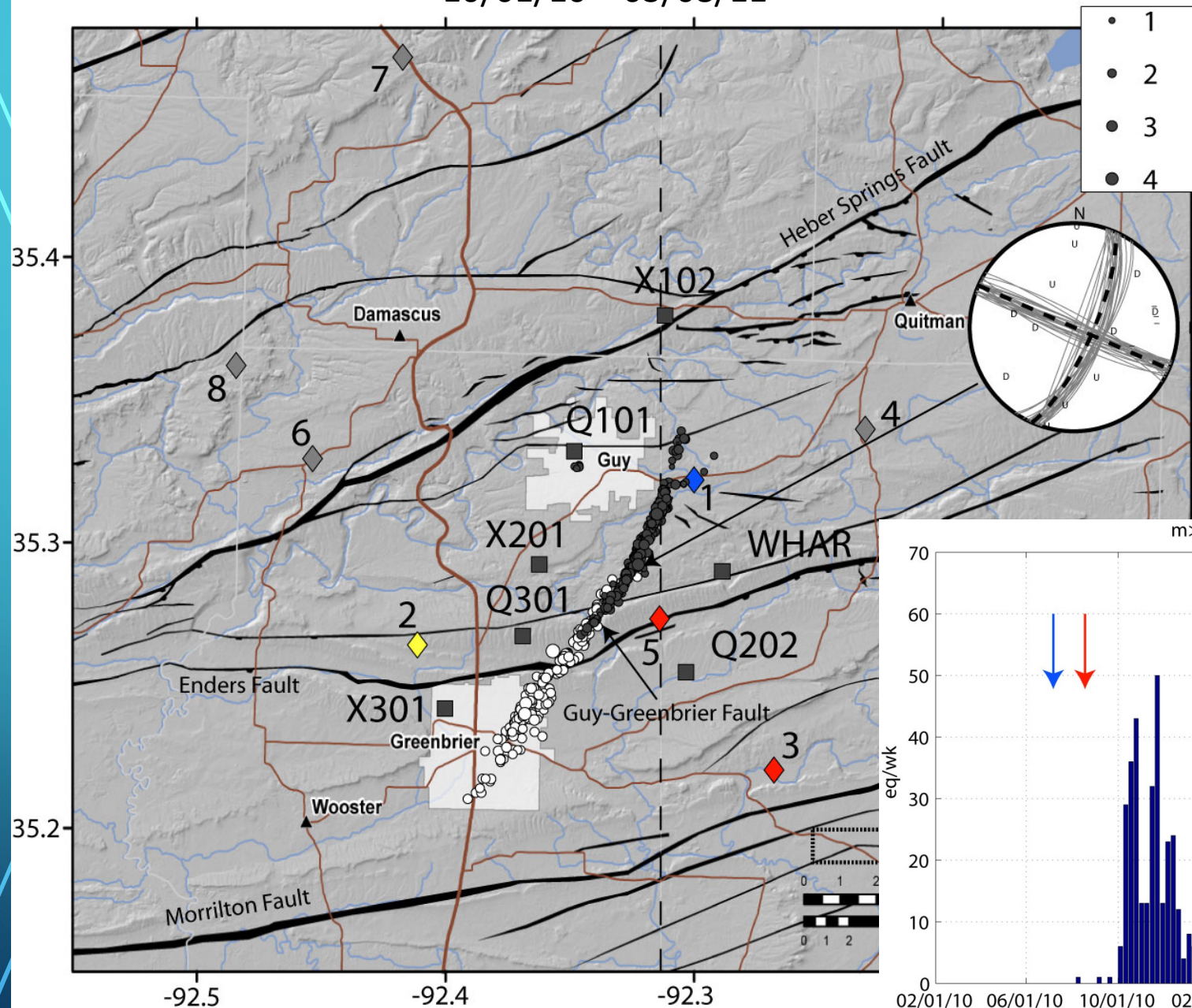








10/01/10 – 03/08/11





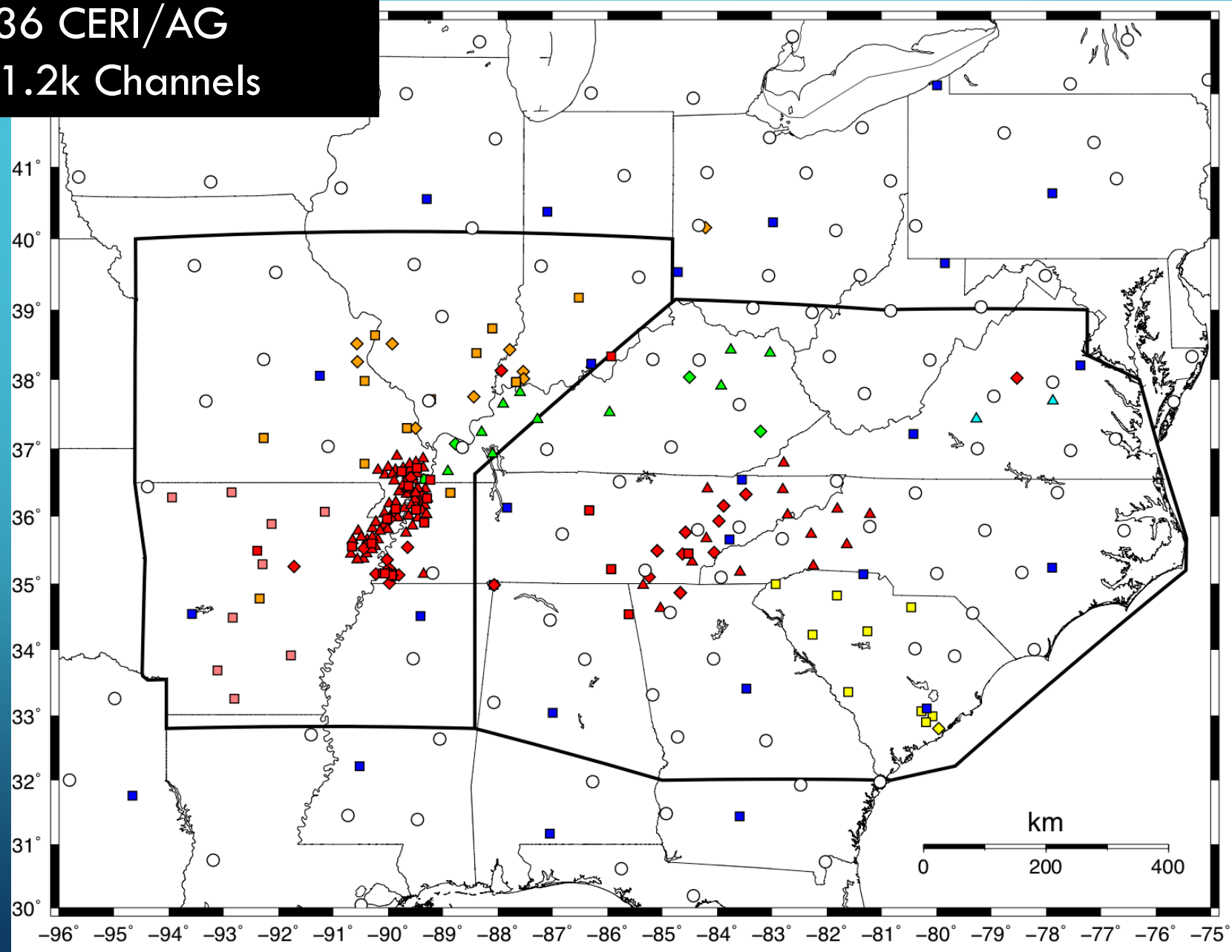
# Hazards

Probabilistic  
Seismic  
Hazards  
Assessment  
PGA 10% in 50  
years



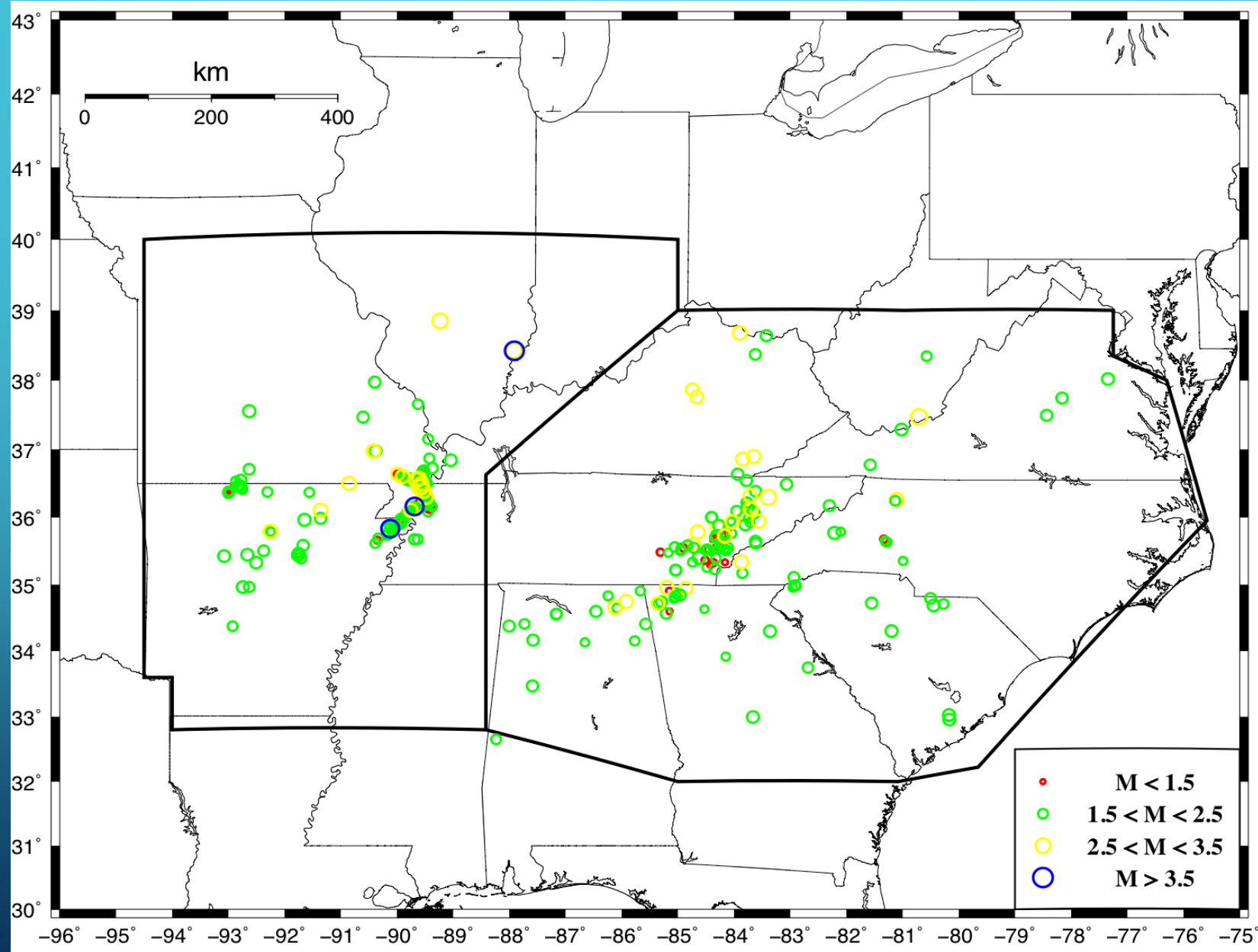


328 Stations  
136 CERI/AG  
~1.2k Channels





# 511 Earthquakes in FYE 6/30/2018



400 NM  
111 SE



# California Launches Nation's First Earthquake Early Warning System



The country's first publicly available, statewide warning system could give California residents crucial seconds to duck and cover before a quake.



The Cypress Freeway collapsed from the Loma Prieta earthquake in the San Francisco Bay Area in 1989, killing 42 people. Credit: Jim Sugar/Corbis Historical/Corbis via Getty Images





Thank You  
And  
Welcome to UofM!