

Seismic Policy and Regulation in Western Kentucky

Kentucky Congressional Office Briefing

By

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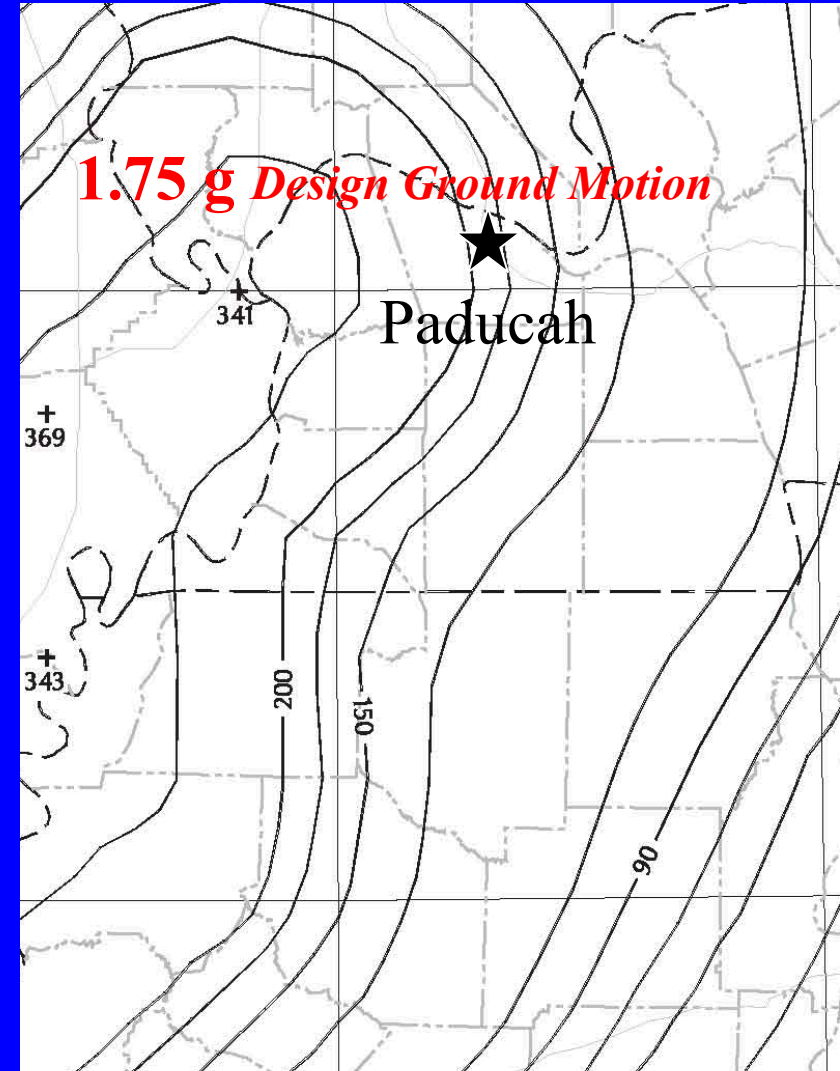
Outline

- Introduction - Problems
- Making of Seismic Policy and Regulation
- KGS Activity
- Progress
- Suggested Actions

Introduction – *Design Ground Motion* (Policy)

- **Design Ground Motion:** the level of ground shaking used for engineering design, construction, and safety regulations – Policy
- Higher level of design ground motion results in more expensive construction and stricter safety regulations

Introduction – *Design Ground Motion (Policy)*



Paducah design ground motion more stringent than San Francisco

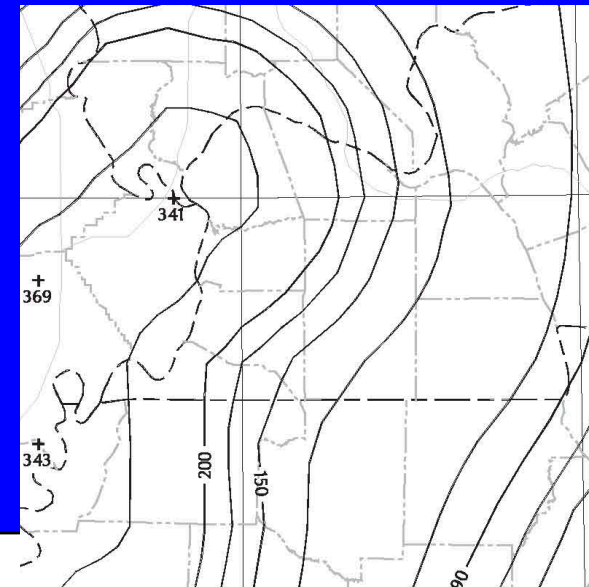
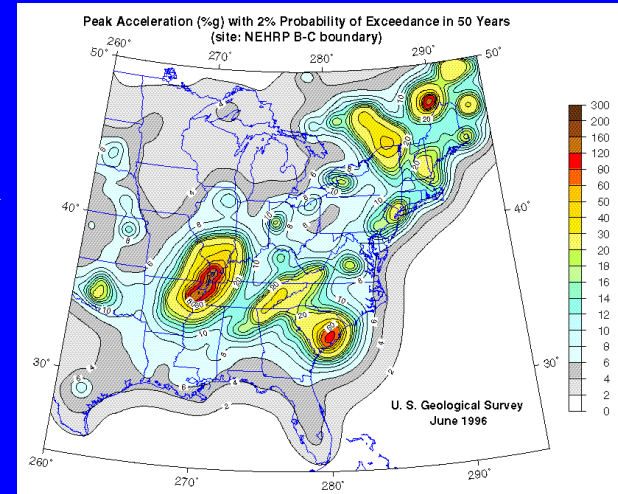
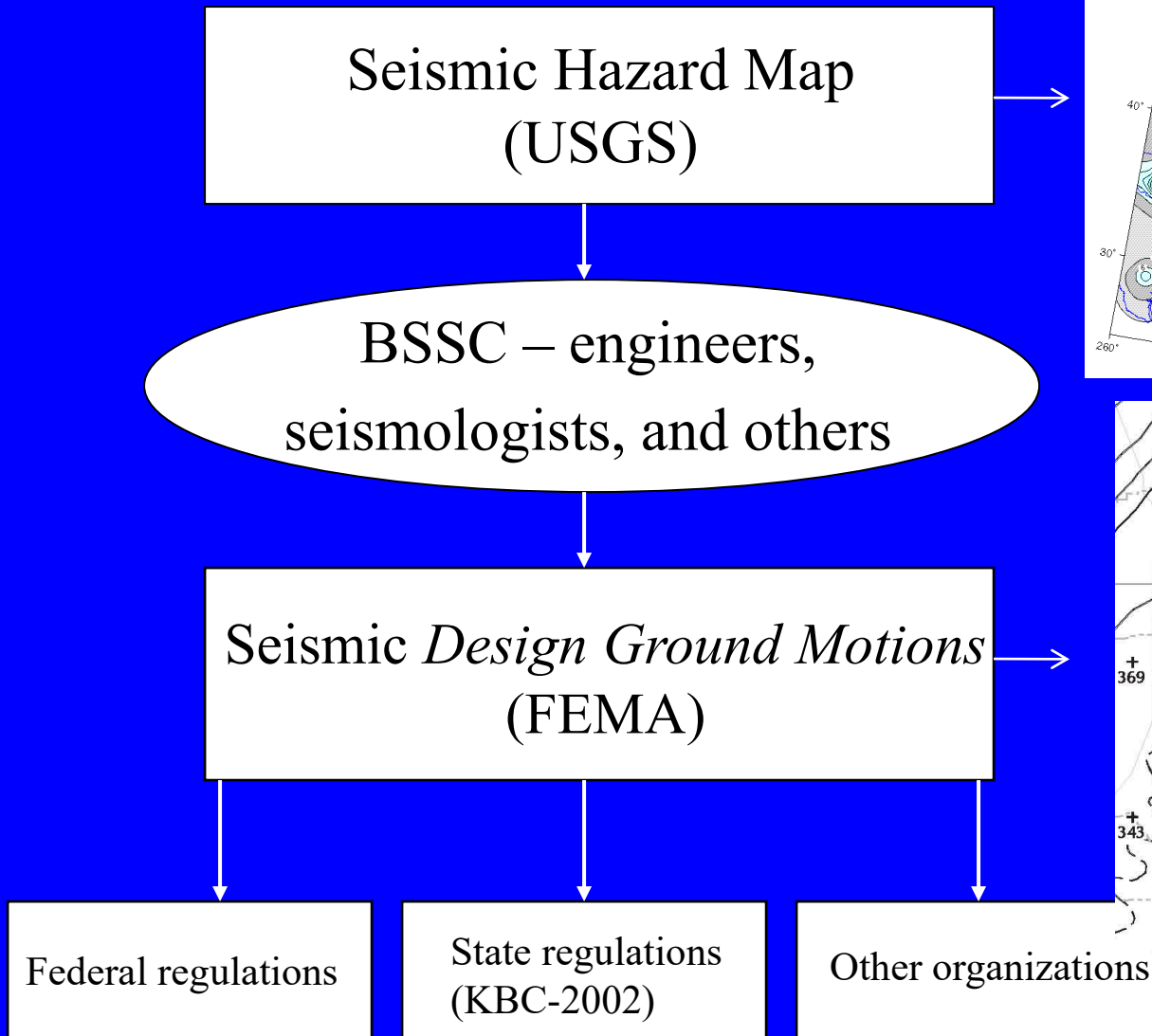
Introduction – *Design Ground Motion* (Policy)

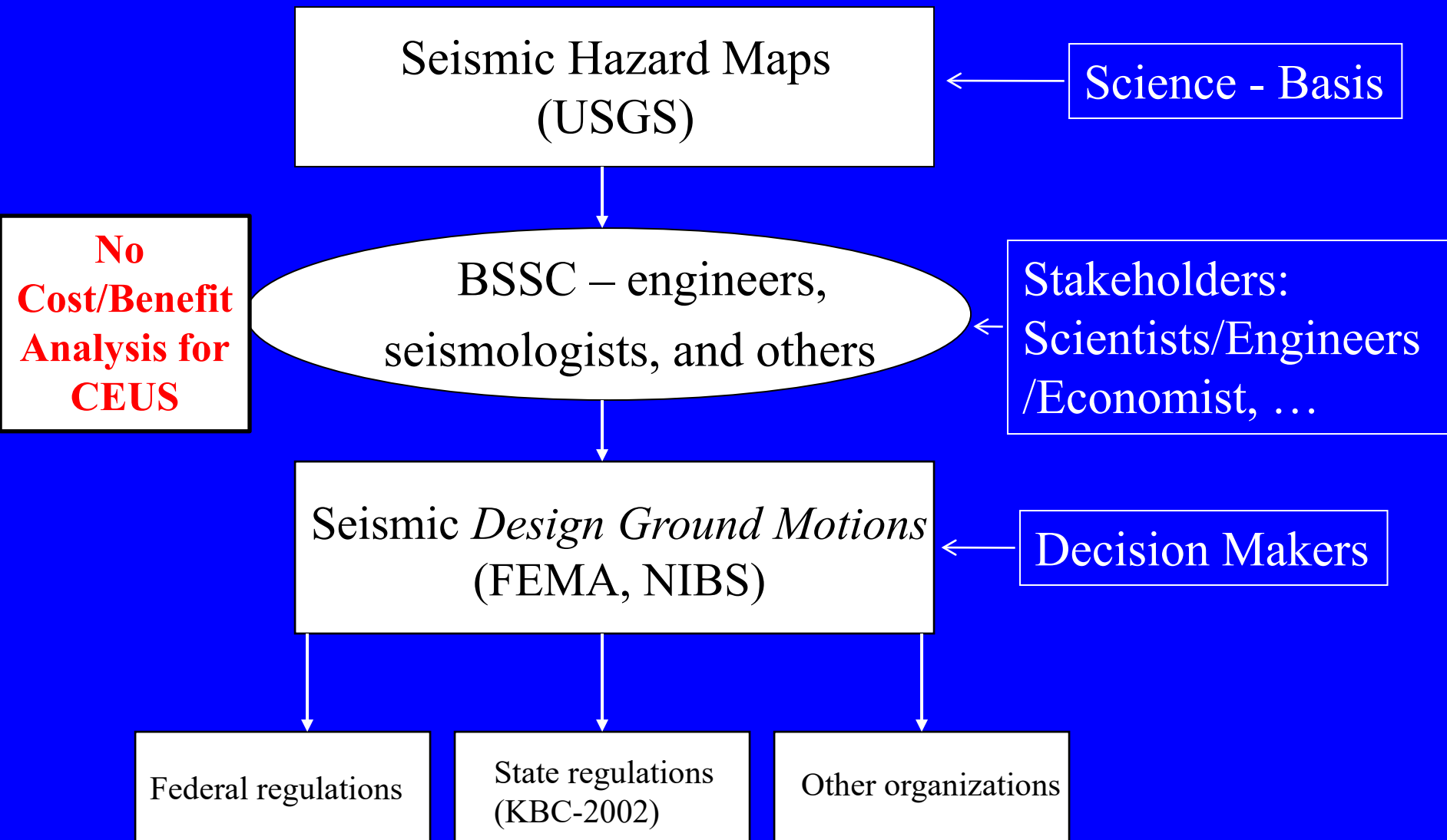
- Design Ground Motion: the level of ground shaking used for engineering design, construction, and safety regulations – Policy
- Higher level of design ground motion results in more expensive construction and stricter safety regulations

Introduction – Impacts on WKY

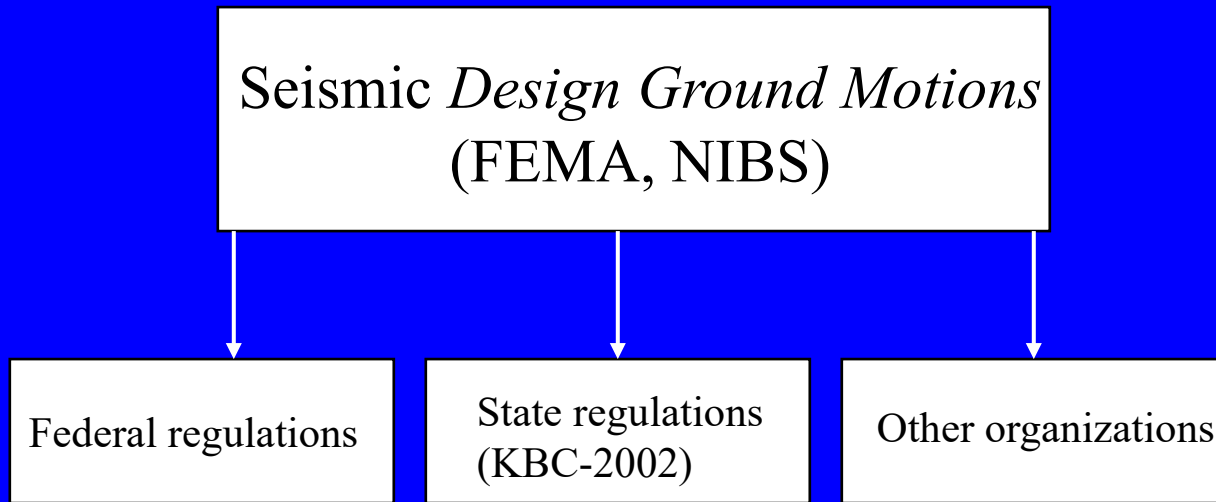
- Major economic loss to the area because of the *design ground motion* and misconceptions about the New Madrid Seismic Zone
- Mr. David Mast (2002): “Why can I not build a two-story brick house in Paducah?” – KY Residential Code
- Technical issues related to perceptions of W Ky seismicity, historical occurrence of faulting and local seismicity at the PGDP site have impacted permitting schedule of a solid waste landfill and complicated the feasibility analysis of disposal options for cleanup/D&D wastes

Policy Making: Development of *Design Ground Motions*



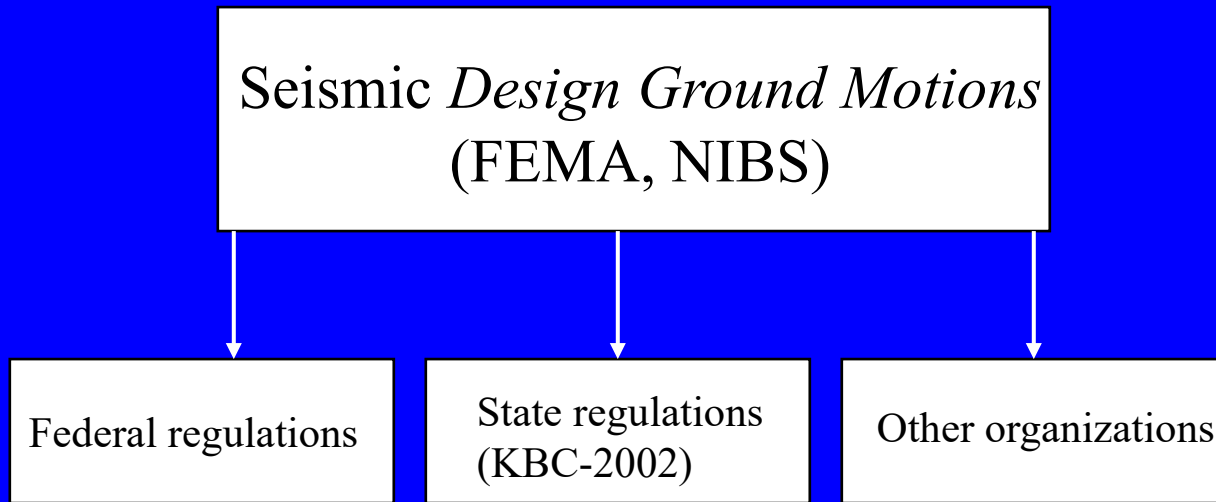
Policy Making: Development of *Design Ground Motions*

Fallout



- Building Codes (Policy)
 - Federal – FEMA, NIBS, USGS
 - State - Ky. Dept of Housing, KGS
 - Other organization – BSSC (Building Seismic Safety Council), SEAOK (Structural Engineer Association of Kentucky), Home Builder Association, ...
 - Local community
 - Private (building/home owner)

Fallout



- Landfill Seismic Design (Policy)
 - Federal –EPA, USGS
 - State – EEC, KGS
 - Local Community
 - Private Organizations and Consultants
 - Private Citizens

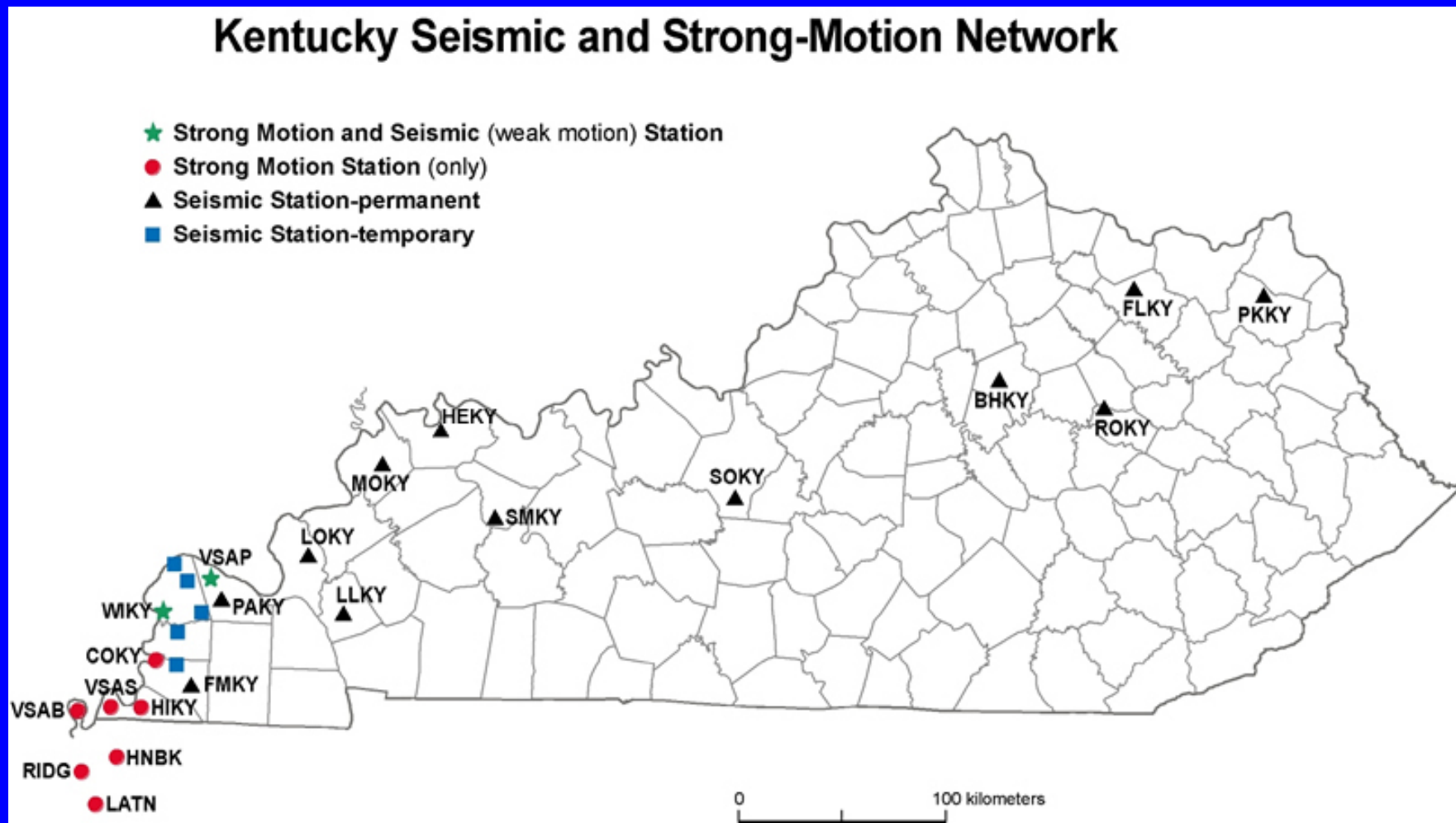
Fallout

- Federal and State Facility Siting (Policy)
 - Nuclear Facility
 - Federal - DOE, NRC, USGS, EPA
 - State – CHFS, Economic Development, ...
 - Local government
 - Others – EPRI (Electrical Power Research Institute)
 - Private Citizen
 - Power Plant
 - Federal - FERC, USGS, EPA
 - State – Economic Development, ...
 - Local government
 - Others – EPRI (Electrical Power Research Institute)
 - Private Citizen

KGS Activities

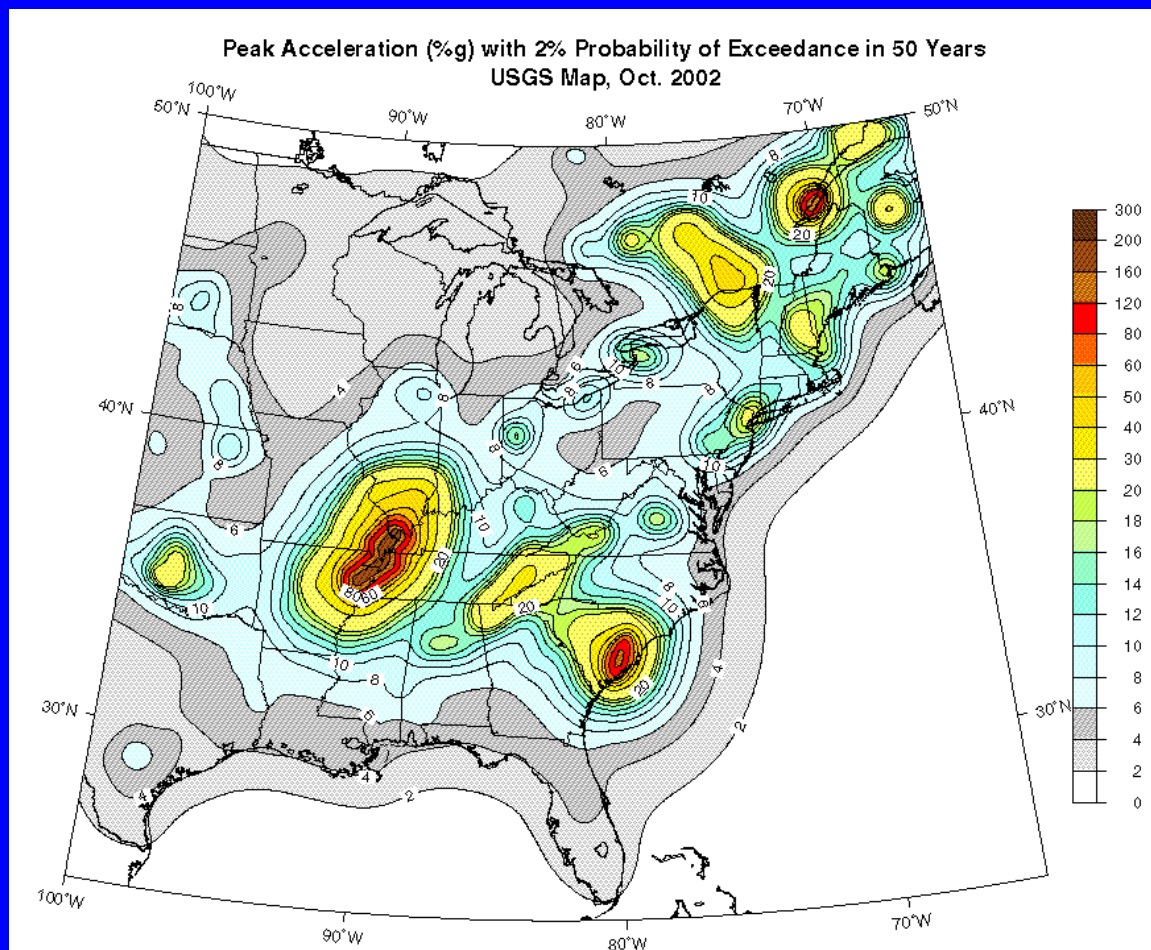
- Scientific Research and Information Dissemination
 - Kentucky Seismic and Strong-Motion Network (including CUSSO)
 - Engaging scientific discussions with USGS and others
 - Goal is to scientifically and defensibly determine seismic hazard, risk, and engineering criteria in the Commonwealth
- Participating in Policy Making
 - Provide seismic hazard and risk information
 - Organizing and participating workshops
 - Dialogue with policy makers
 - Work with state agencies and others

KGS Activities - Science



KSSMN funded with partial support from USGS and DOE.

KGS Activities - Science/Fallout



USGS National Seismic Hazard Maps

Kentucky studies indicate flawed methodology for central US.

KGS Activities - Science/Fallout

- Comments on the 2008 USGS National Hazard maps
 - Methodology is flawed
 - NMSZ Input Parameters are not scientifically consistent
 - Confusion on the hazard maps
- Communicate to the comments to NEHRP-ACEHR
 - The National Earthquake Hazard Reduction Program (NEHRP) – Advisory Committee on Earthquake Hazards Reduction (ACEHR)

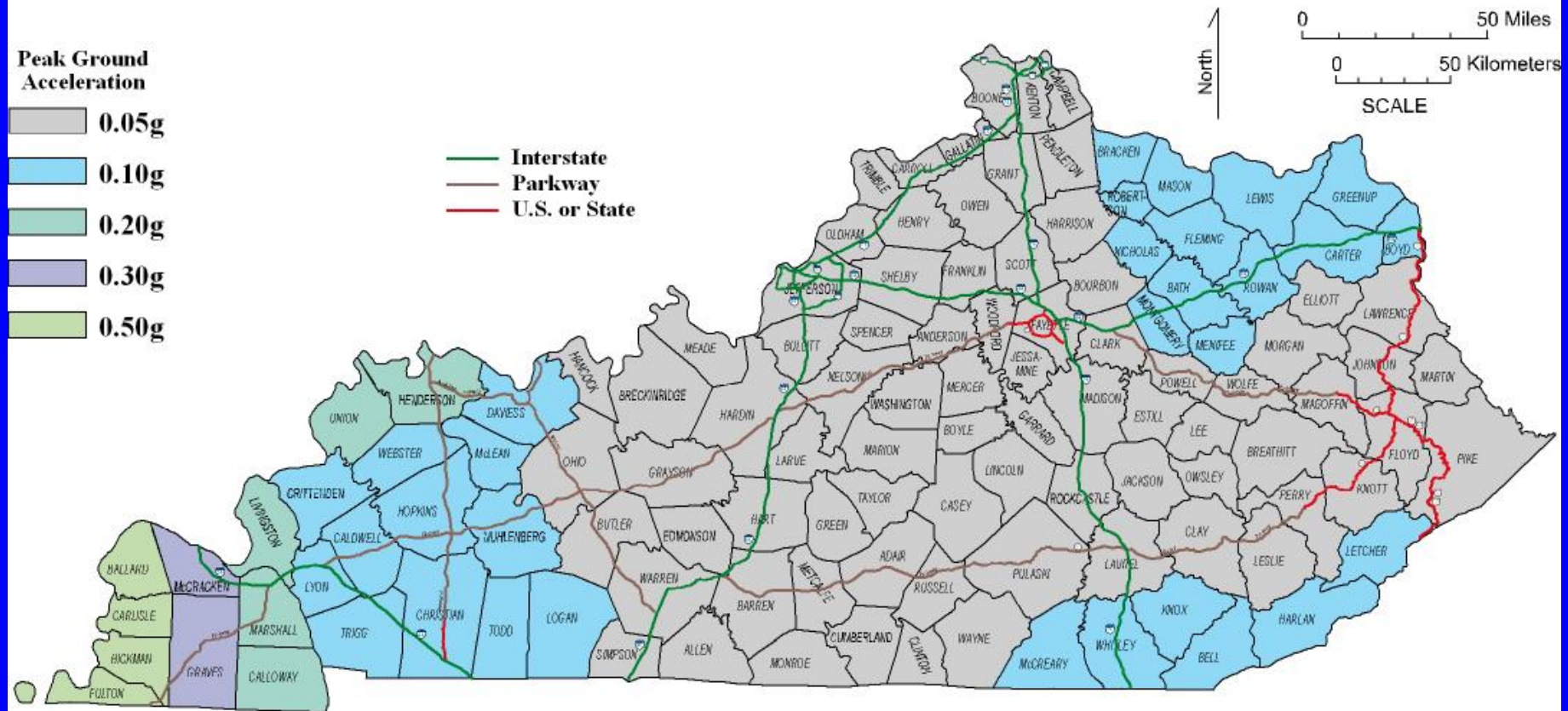
KGS Progress – Science

- The USGS disclaimer on the 2008 national seismic hazard maps:
 - “it is anticipated that the new 2008 USGS hazard data will be the basis for the seismic *design maps* in future editions of the NEHRP Recommended Provisions, the ASCE/SEI 7 Standard, and the International Building and Residential Codes”
 - “the 2008 USGS hazard maps should not be substituted for the model building code *design maps* nor should they be used with ASCE/SEI 41 or 31 for seismic rehabilitation or evaluation”

KGS Progress – Science

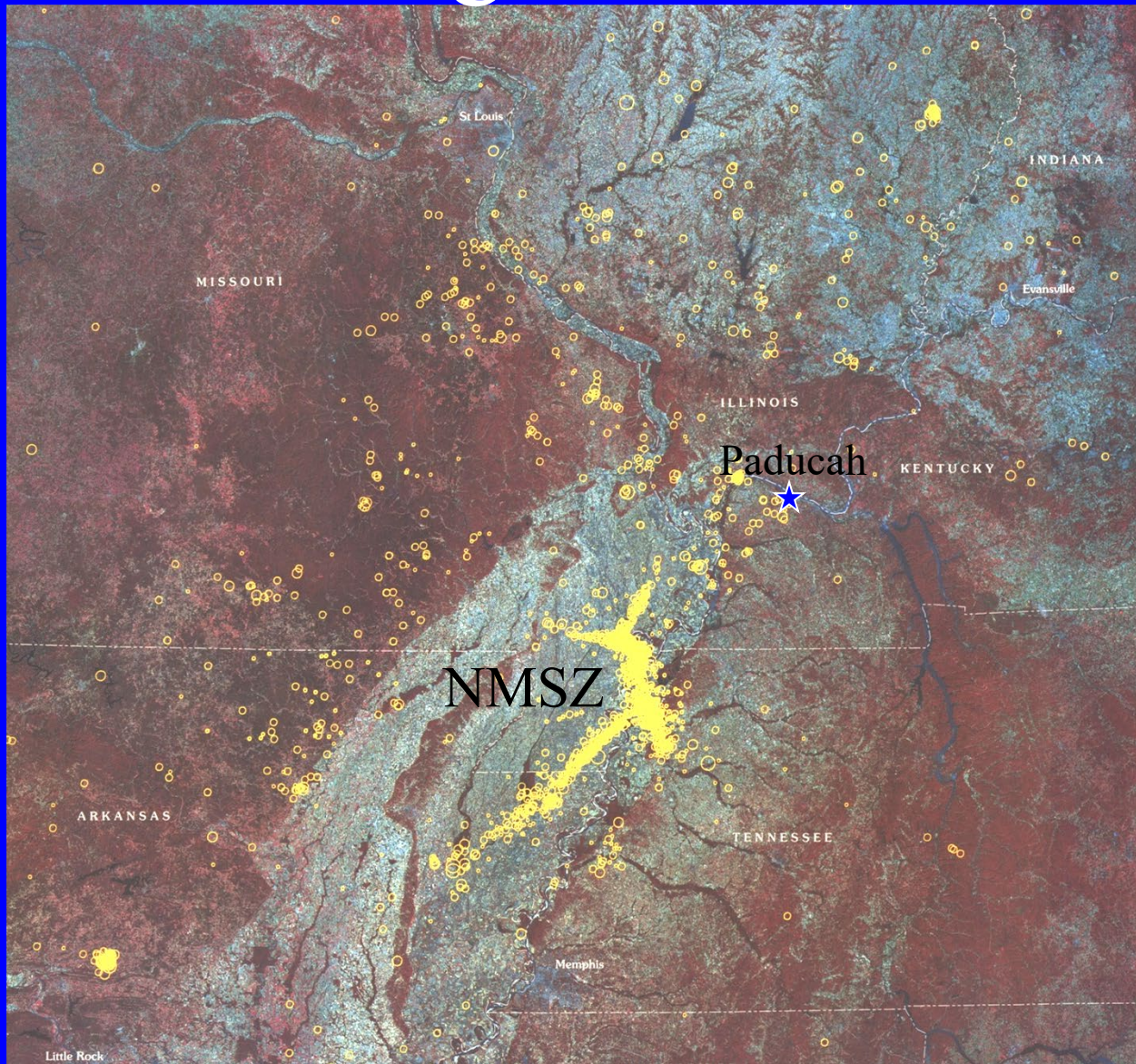
Peak Ground Acceleration for the Maximum Credible Earthquake (MCE)

(Probability of exceedance in 75 years: 10% for New Madrid, 3% for Wabash Valley, and less than 2% for all other seismic zones)



Deterministic PGA map (Wang and others, 2007)

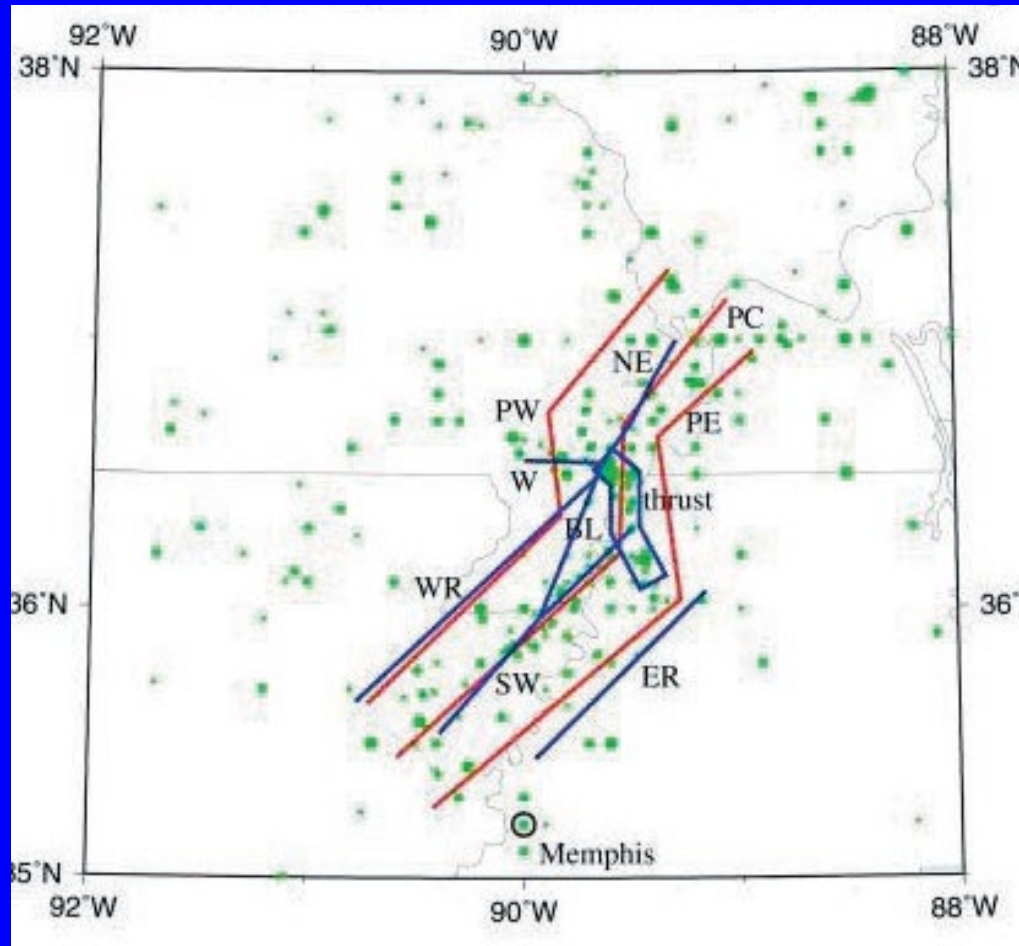
KGS Progress – Science



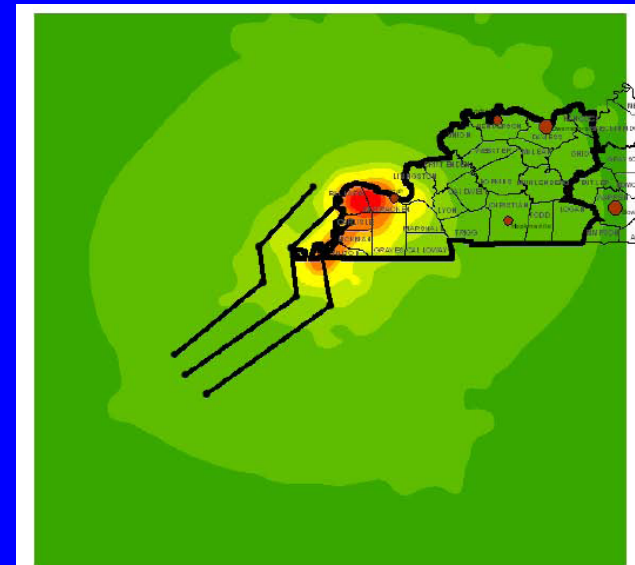
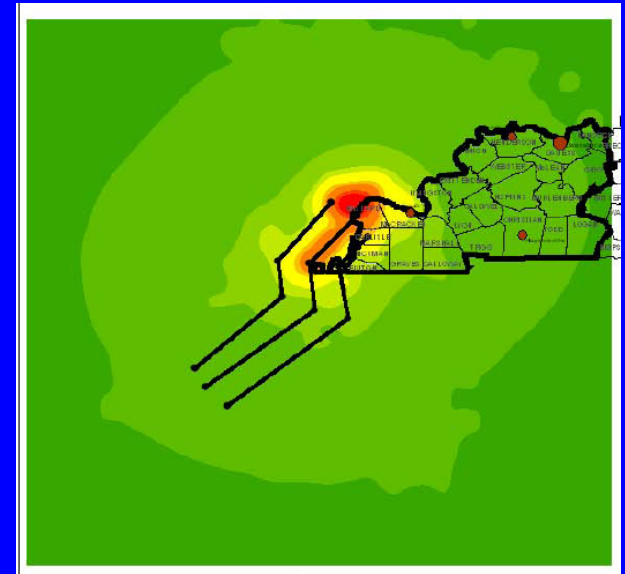
Recorded earthquakes between 1974 and 2000

Fallout of Flawed Methodology

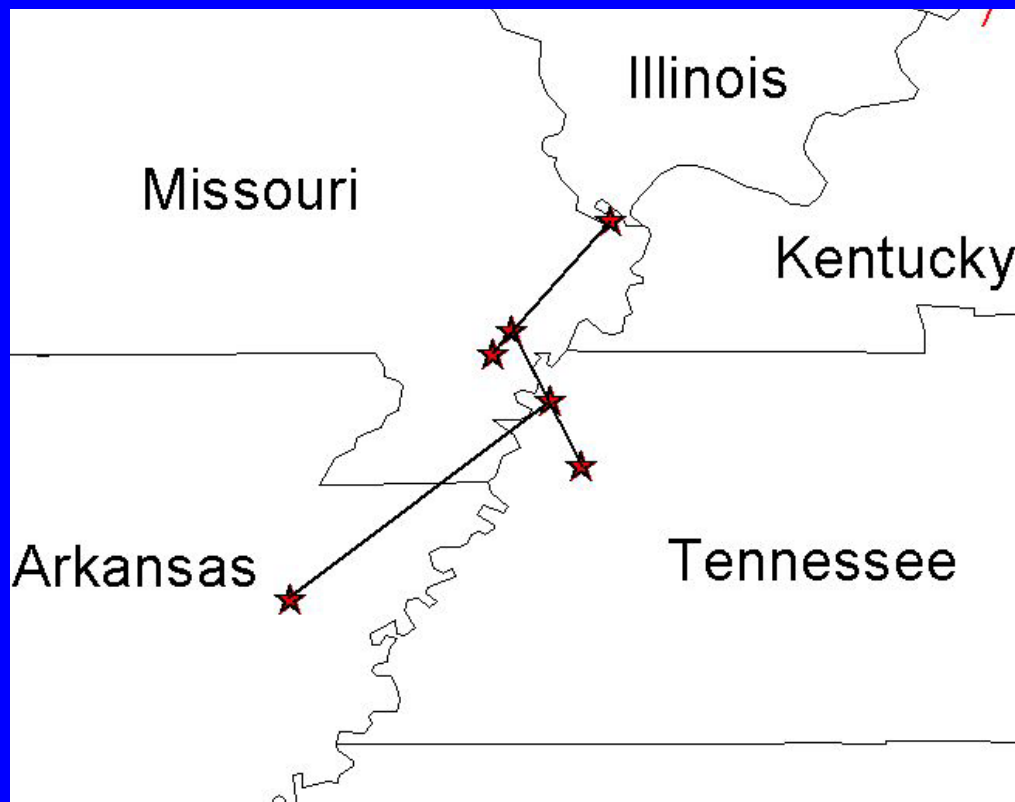
MAEC Report (2008)



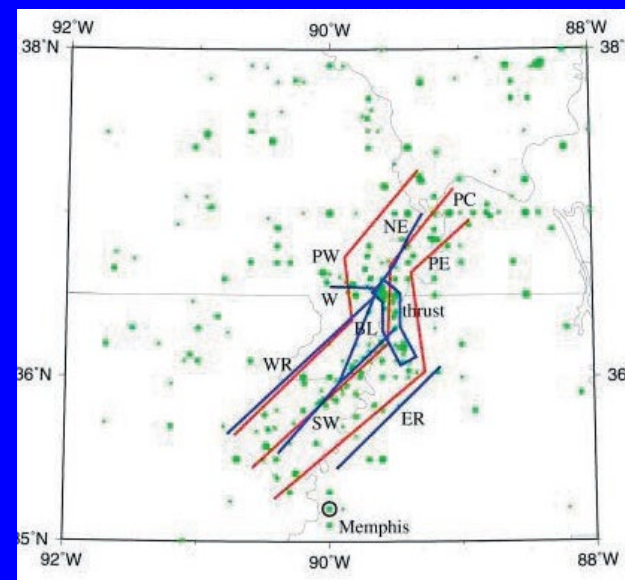
Actual (blue) and fictitious (red) faults for the New Madrid Seismic Zone



KGS Progress – Science



Faults for the New Madrid Seismic Zone (CUSEC-Eight State Geologist recommendation)



Fictitious or hypothetical faults (red)
for the New Madrid Seismic Zone (USGS)

Recent DOE-sponsored field work completed by KRCEE and a review completed by a DOE Independent Technical Review Team concluded "No active Holocene-age faults at the PGDP"

KGS Activities - Policy

- Participating in Policy Making
 - 2002 NEHRP Seismic Hazard and Design Maps Workshop
 - NEHRP (ACEHR) Conferences and Workshops
 - 2004 SESAC
 - BSSC Conferences and Workshops
 - AASHTO workshops
 - Others

Suggested Actions

- Science
 - KGS, KRCEE, and UK continue seismic research
 - Request a support letter from Kentucky Congressional Delegation for the network upgrade
- Policy and Regulation
 - KCD letter to NEHRP
 - KCD letter to DOE

Thank You!