

# Comments on the Japan Near-Term Task Force Report

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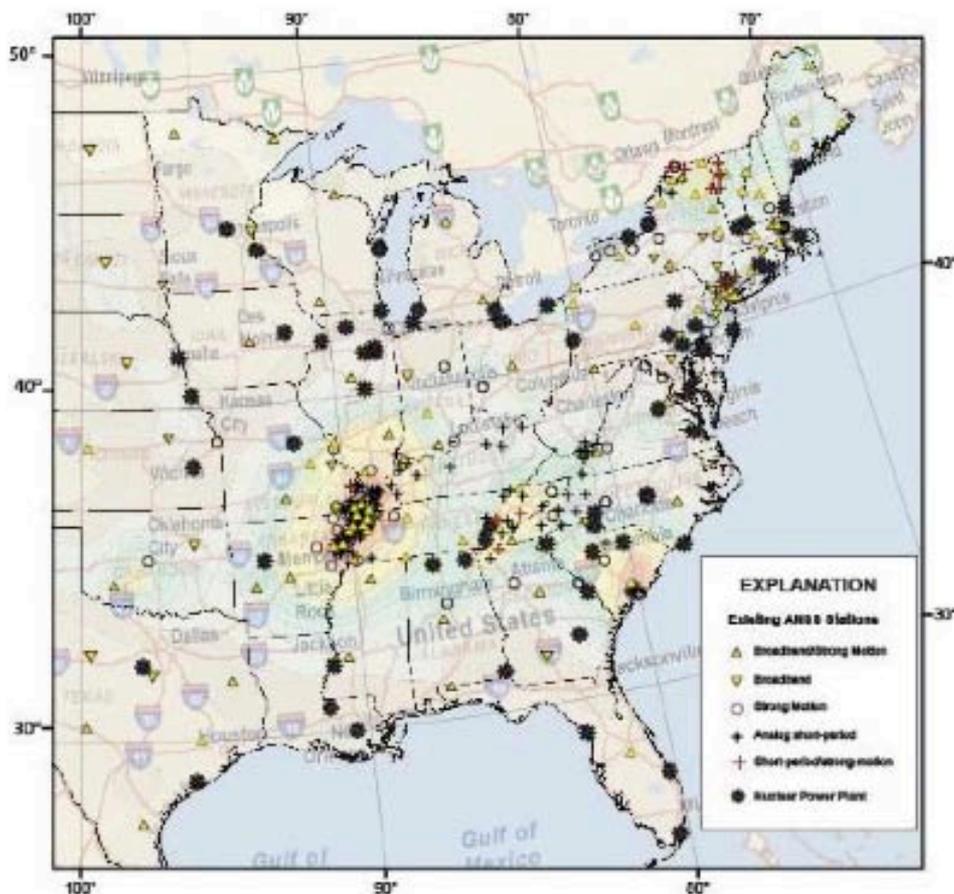
Reston, Virginia

# USGS-NRC Collaboration

- Seismic hazard analyses for new license applications
- *ShakeCast* alerting for ground motion at U.S. nuclear plants
- Evaluation of seismic monitoring needs in the East
- Research on ground motion
- Tsunami hazard assessment



## Improved Earthquake Monitoring in the Central and Eastern United States in Support of Seismic Assessments for Critical Facilities

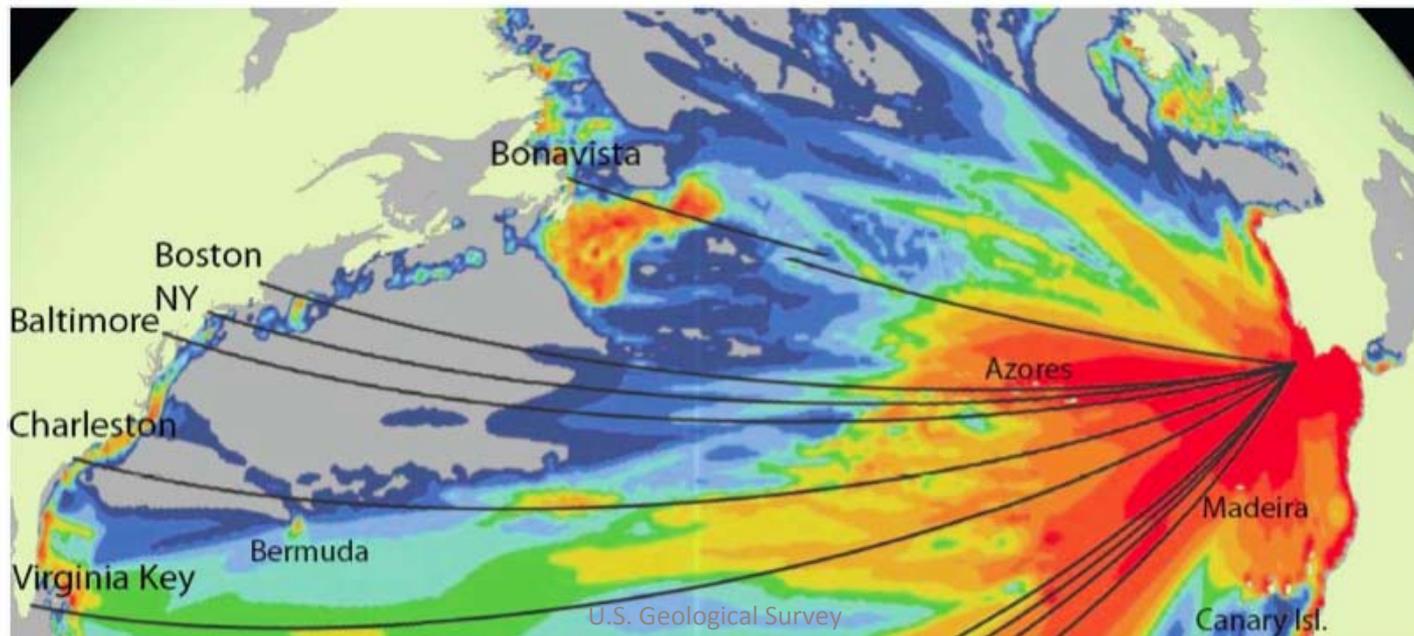


# Evaluation of Tsunami Sources with the Potential to Impact the U.S. Atlantic and Gulf Coasts

## An Updated Report to the Nuclear Regulatory Commission

By Atlantic and Gulf of Mexico Tsunami Hazard Assessment Group

Rev. Aug. 2008

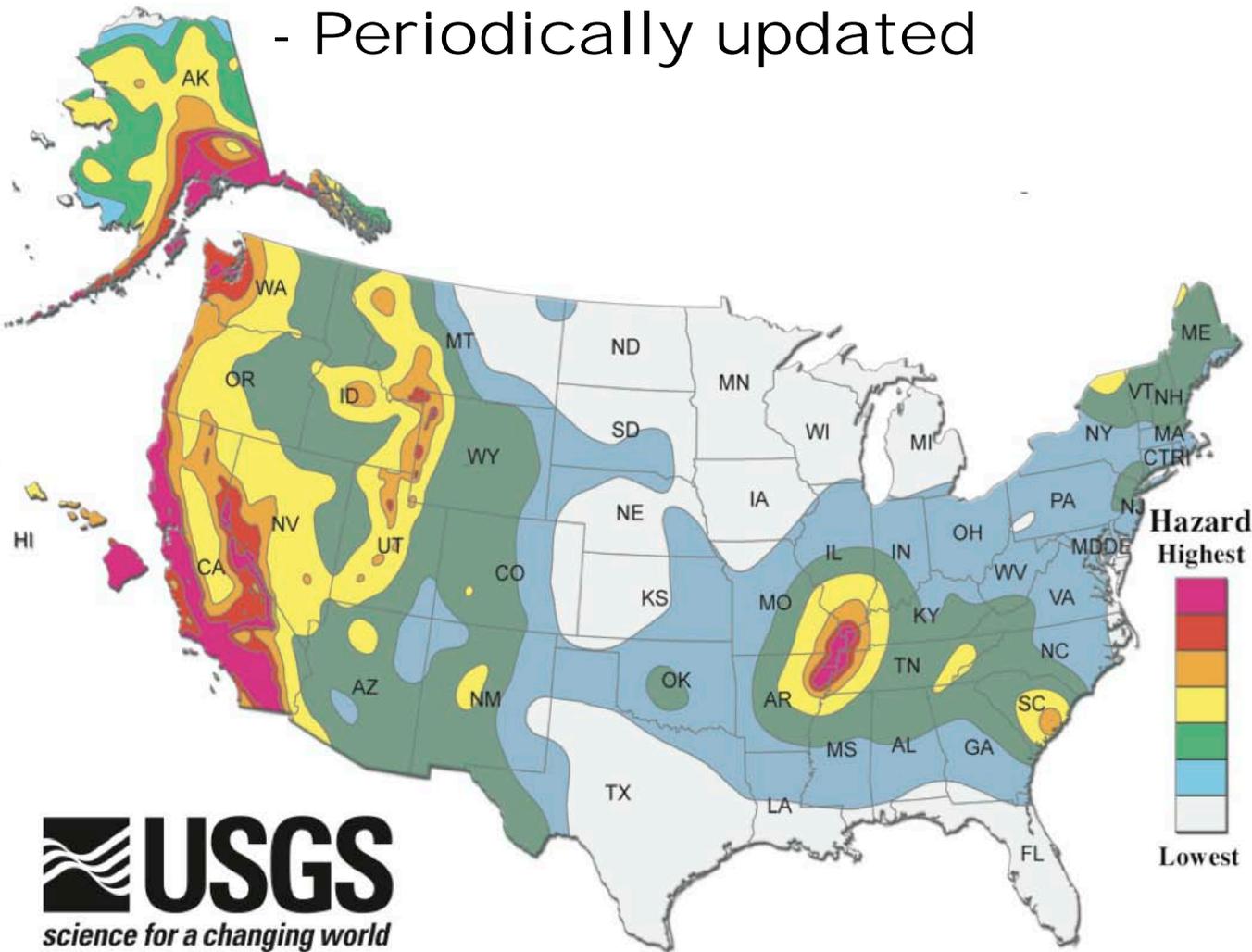


# USGS Approach to Earthquake Hazards

- Earthquake hazards are periodically reevaluated as new data become available and new research improves ground motion models
- National Seismic Hazard Maps are updated every 6 years

# National Seismic Hazard Maps

- Basis for U.S. Building Codes
- Periodically updated



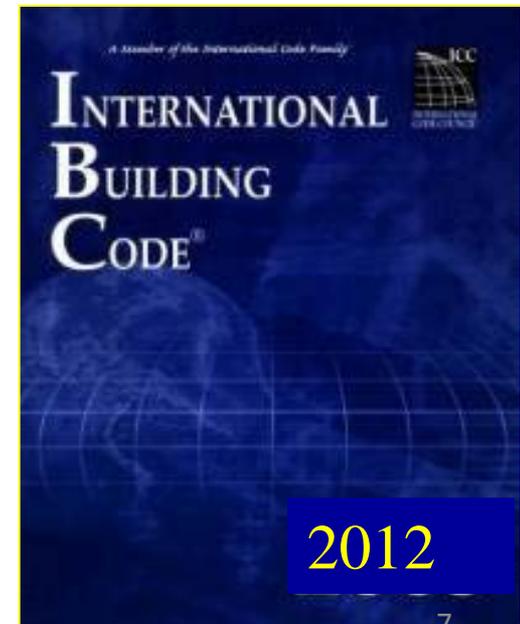
U.S. Geological Survey



## NEHRP Recommended Seismic Provisions

for New Buildings and Other Structures

FEMA P-750 / 2009 Edition



2012

# Comments on NTTF Rec. 2.1

Much has been learned since the plants were licensed and the hazard estimates have changed significantly in some places (including the Virginia seismic zone)

# Comments on NTTF Rec. 2.1

- The approach used in the original hazard assessments at nuclear plants was deterministic
- Both the USGS and NRC now use similar probabilistic methods

# Comments on NTTF Rec. 2.1

NRC and USGS have worked together on:

- implementing the USGS model in the NRC (used for the GI-199 screening) and
- the new CEUS SSC model, now being finalized

# Comments on NNTF Rec. 2.2

- Can be achieved and makes sense. It would bring NRC in-line with other agencies
- USGS and NRC/RES staff have already talked about how to coordinate assessment efforts

# Comments on NTTF Rec. 2.2

By comparison:

- USGS updates the US hazard maps every 6 years to support the building code (via NIST)
- DOE has a 10 year review cycle

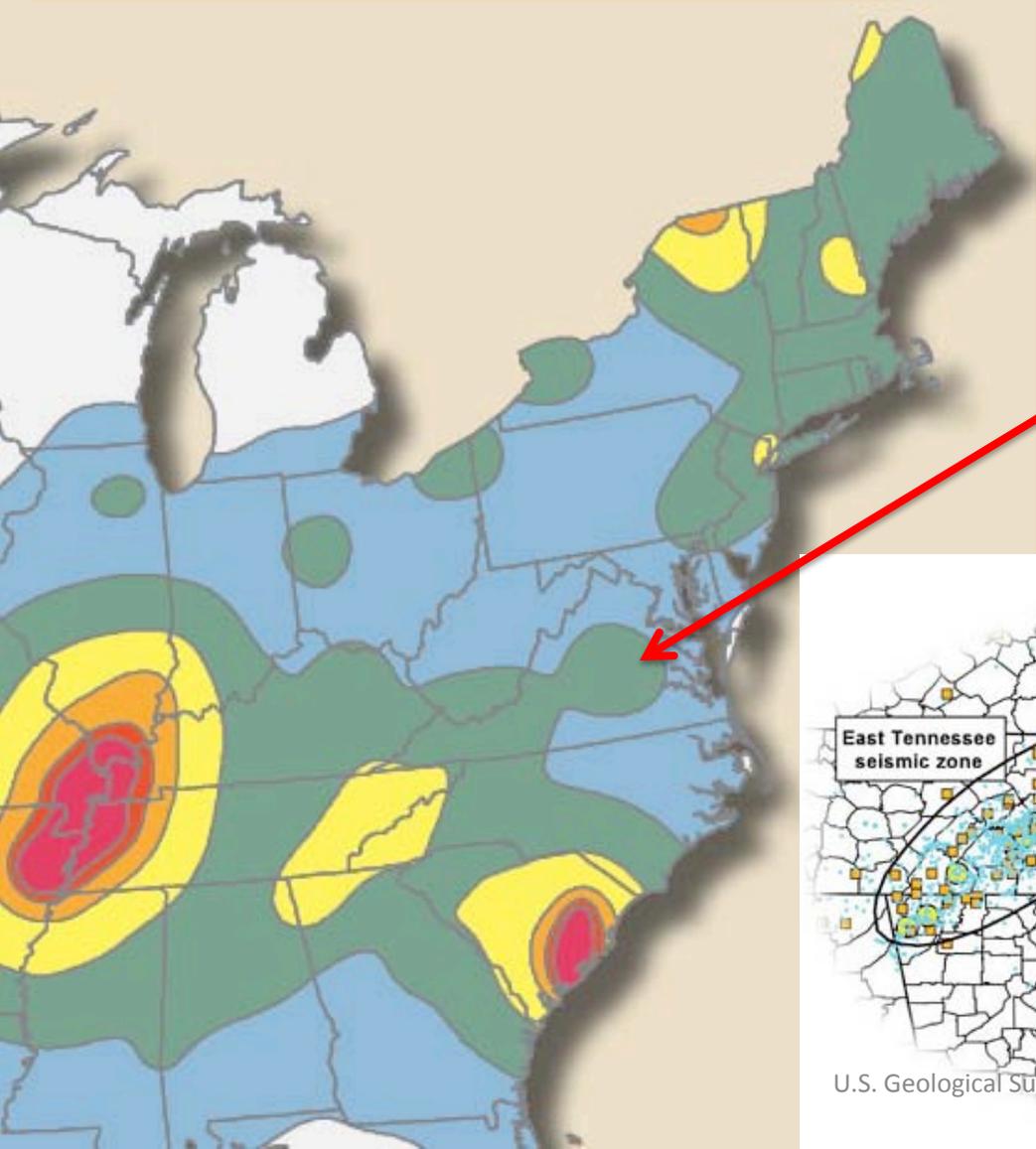
# Outdated Instrumentation

- Virginia quake is your alert
- Modern instrumentation in the plants could provide both NPP operators and NRC staff with the data they need to rapidly determine appropriate post-earthquake actions

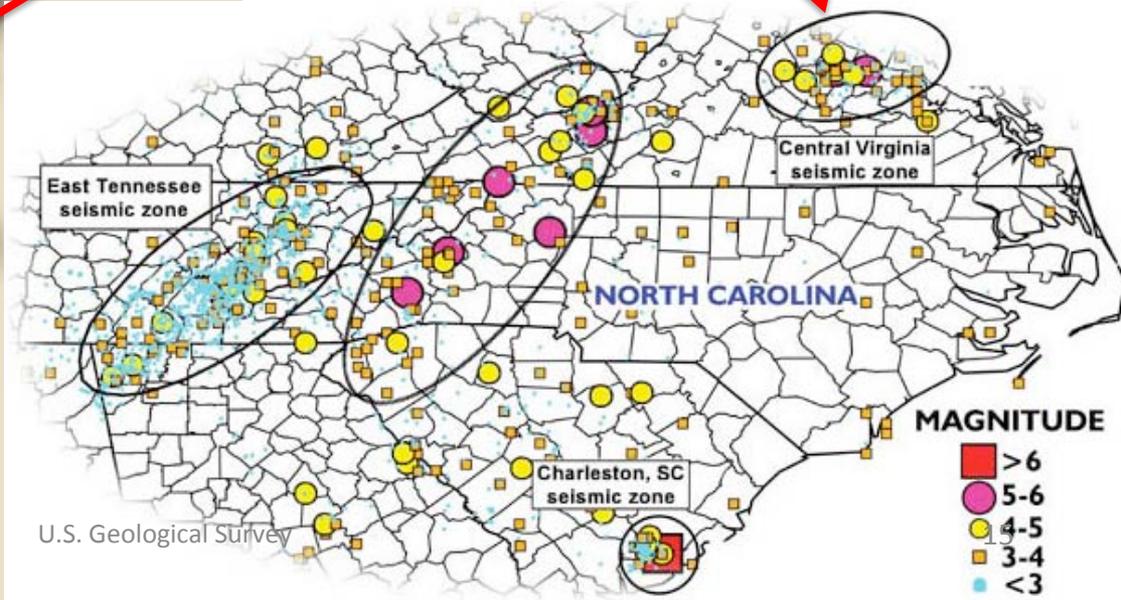
# The Virginia Earthquake

- Largest in Virginia in 114 yr.
- Occurred in mapped zone of moderate seismic hazard
- No USGS-supported regional seismic network
- Estimated acceleration at North Anna NPP of 0.26g

# USGS National Seismic Hazard Map

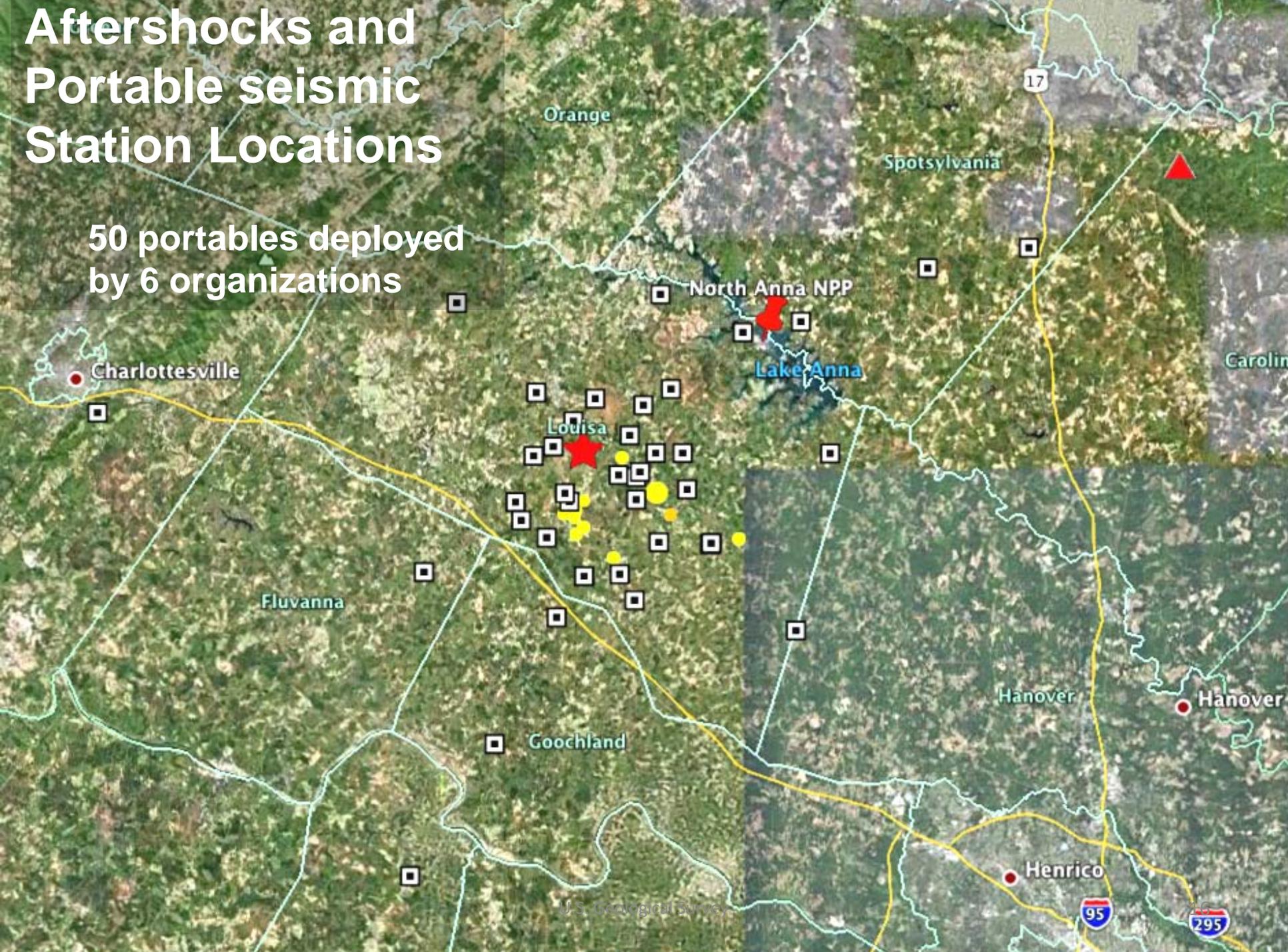


## Central Virginia Seismic Zone



# Aftershocks and Portable seismic Station Locations

50 portables deployed by 6 organizations



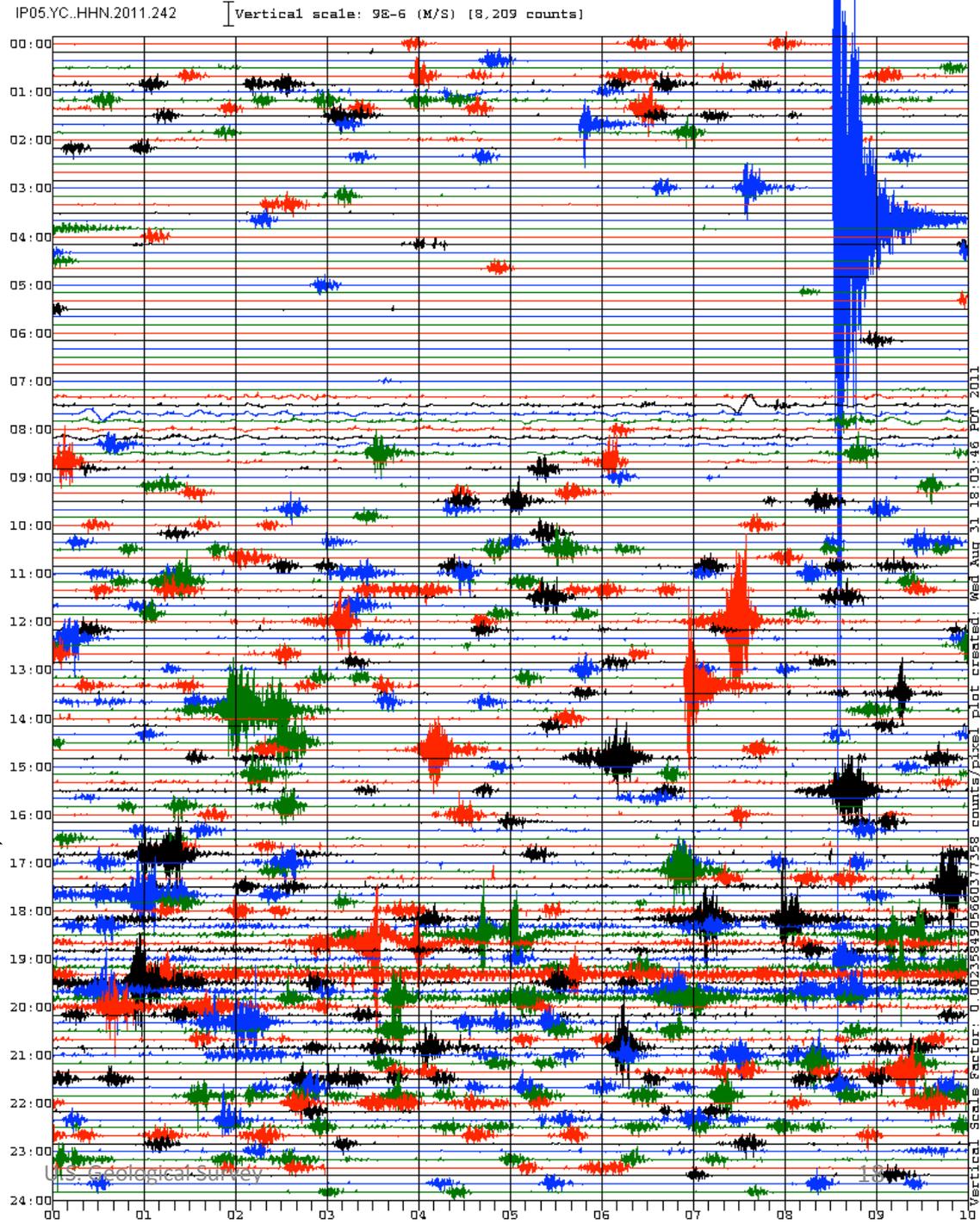
# Damage in Epicentral Area



Aftershocks  
will continue  
for many  
months

Record is from  
August 30, 2011

M3.4 aftershock  
produced 0.25g  
at its epicenter



Large central and eastern U.S. earthquakes are rare...

...but their impacts can be **large**

- Active faults largely hidden
- Radiated energies are high
- Seismic waves travel long distances
- Thick soils can amplify ground motions
- Soils are prone to liquefaction
- Structures and lifelines older, less seismically resistant
- Communities are relatively unprepared

# Sources of more information

- USGS earthquake information:
  - *<http://earthquake.usgs.gov>*
- Key documents:
  - Fact Sheet: *Earthquakes In and Near the Northeastern United States, 1638-1998.*
  - Handbook: *Putting Down Roots in Earthquake Country*

# Acronyms

COL	Combined operating license
DBE	Design basis earthquake (a.k.a SSE)
GI-199	Generic Issue 199
GMPE	Ground motion prediction equation
NPP	nuclear power plant
NRO	Office of New Reactors (cliff's group)
NTTF	Japan Near Term Task Force
OBE	Operating Basis Earthquake ground motion
RES	Office of Research
RG	Regulatory guide (RG 1.208 = guide on PSHA)
SSCs	Structures, systems, and components
SSC	Seismic Source Characterization
SSE	Safe shutdown earthquake ground motion