



2021 NATIONAL EARTHQUAKE PROGRAM MANAGERS MEETING

June 17, 2021 – DAY 3
12:00PM – 4:00PM CDT

NEPM Meeting - Reminders

- This meeting is being recorded.
- Mute phones/video unless speaking.
- Post questions/comments/requests in the chat area.
- Technical issues or additional support:
 - Brian Blake – bblake@cusec.org
 - Pascal Schuback – schuback@crew.org

NEPM Meeting - Code of Conduct

- Show up on time & come prepared
- Contribute to meeting goals
- Let everyone participate
- Listen with an open mind



NEPM Meeting - Code of Conduct cont.

- Think before speaking
- Stay on point & on time
- Attack the problem, not the person
- Close decisions & ID action items
- Record outcomes & follow up



Southeast Shakes: Looking back at VA & NC Quakes



Debbie Messmer
Virginia



Kevin Kalbaugh
North Carolina



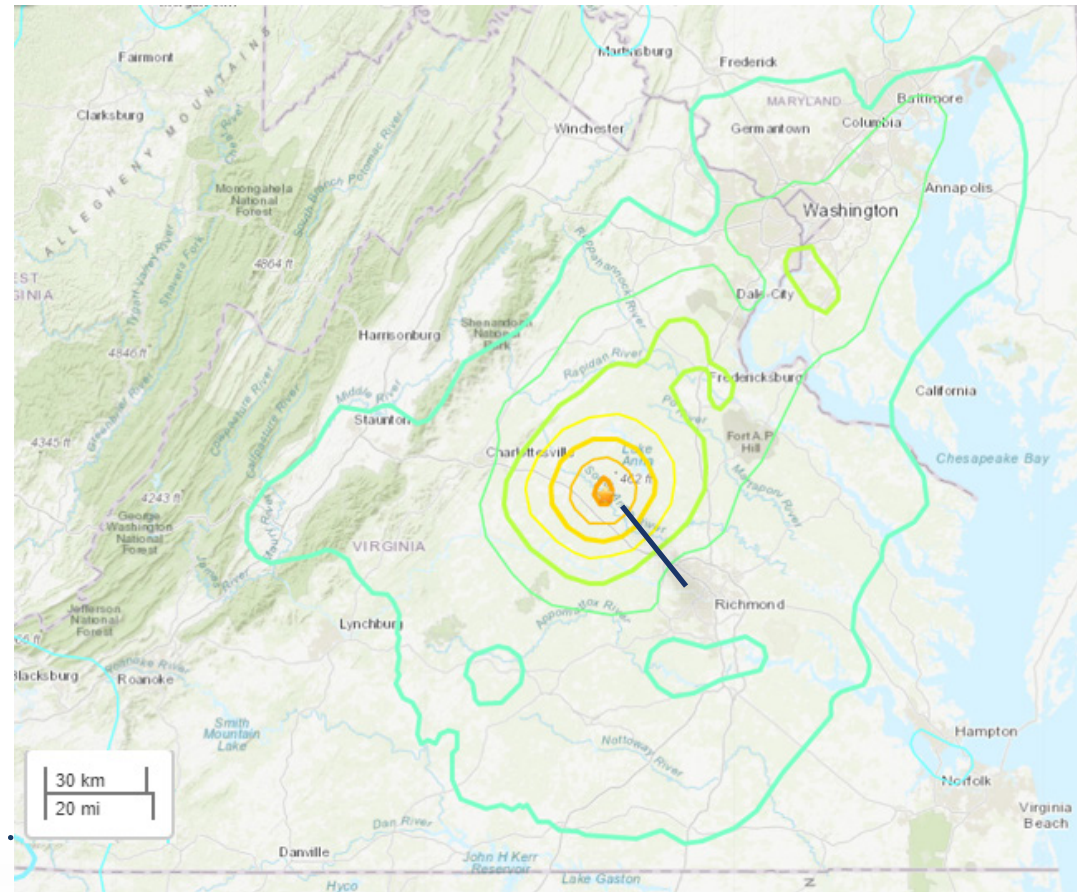
Virginia Department of
Emergency Management

Southeast Shakes: Looking Back at the 2011 Virginia Earthquake

June 17, 2021

Earthquake Details

The Louisa Earthquake was a 5.9 magnitude earthquake at 1:51pm on August 23, 2011

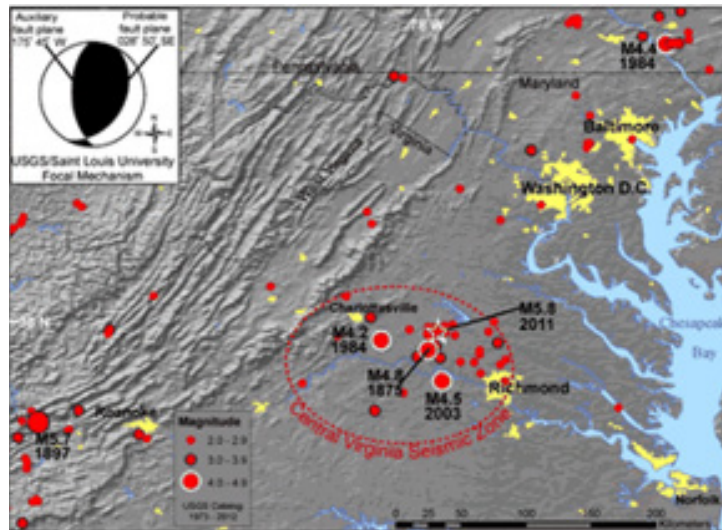


Mineral,
Louisa is 35
miles west of
Richmond

Earthquake Details

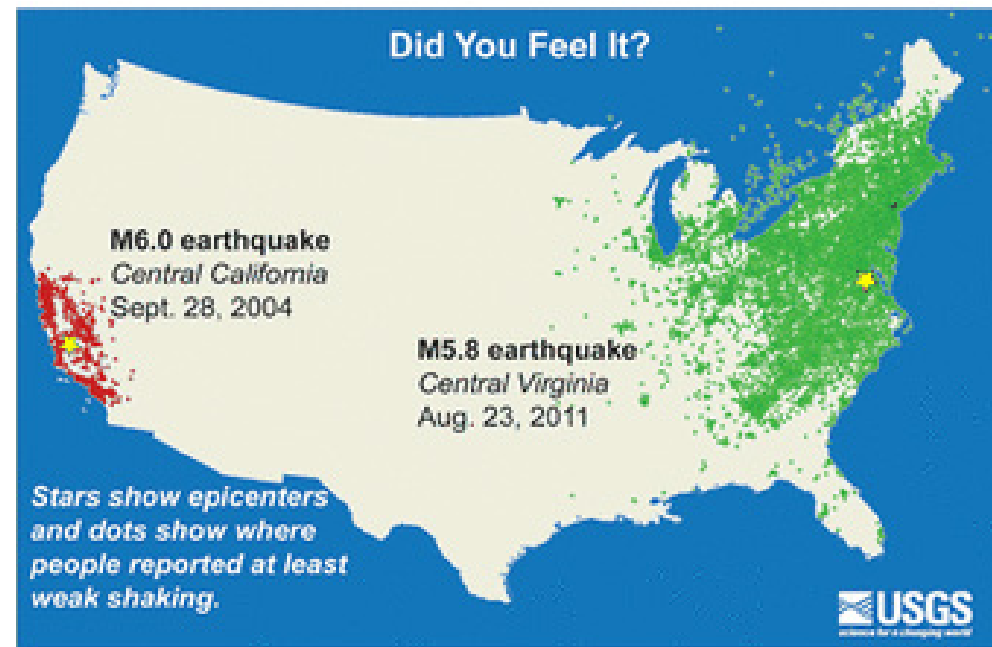
It was the strongest recorded earthquake east of the Rocky Mountains since 1944

It is believed that it was the most widely felt quake in the history of the US, with 1/3 of the population rocking and rolling on that sunny workday



Earthquake Details

It shot out in all directions from a depth of 4 miles below the earth's surface
It was even felt in Canada



148,000
people from
Florida to
Canada, west
to Chicago
reported
feeling it



Damage Photos



Chimney Damage in Louisa County (epicenter)



Armed Forces Retirement Home in Washington DC



Damage Photos



Damage Extent

Public Assistance funding totaled \$52,538,000
(federal and state)

78 large and small projects

Louisa County public schools received the bulk of
the money to rebuild.

Hazard Mitigation Grant Program funding
totaled \$8,500,000.

16 projects were successfully completed
including some large elevation projects



Questions?



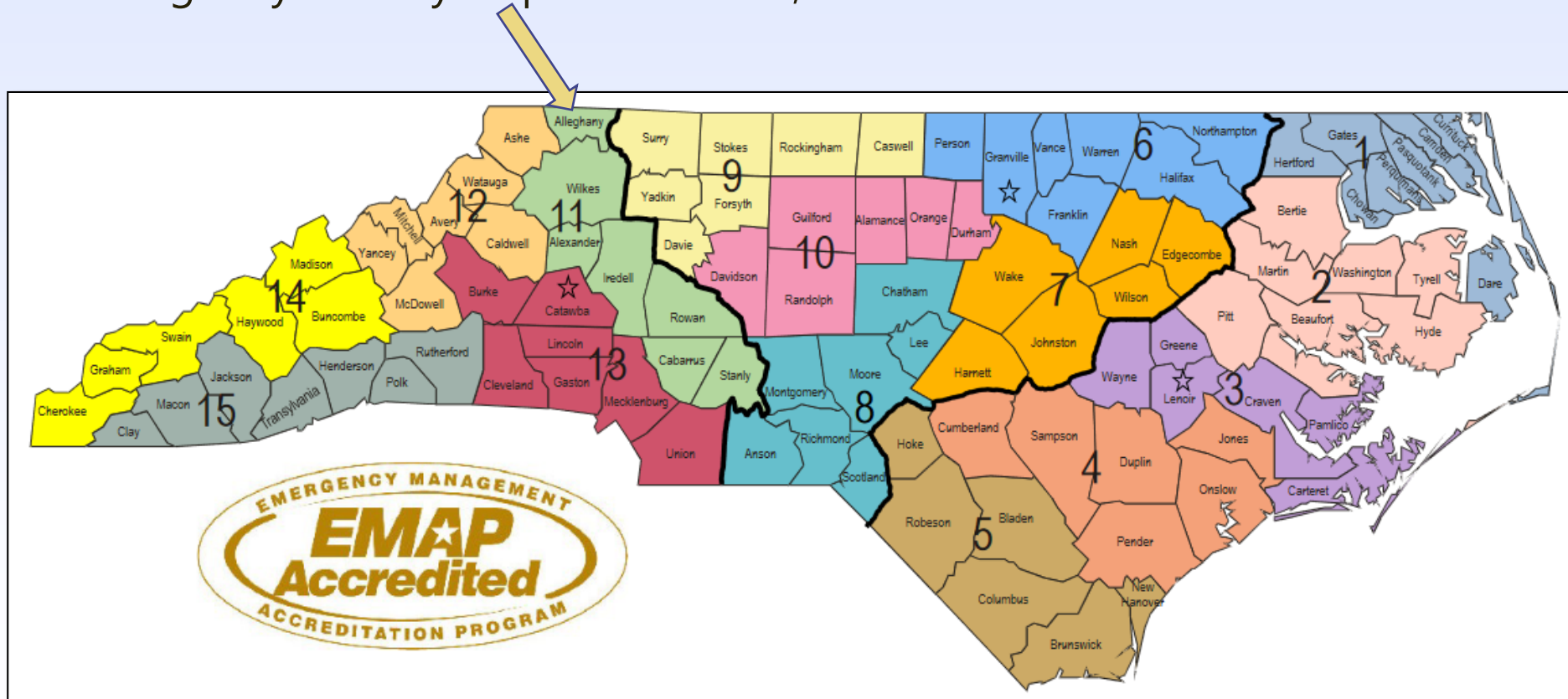
Debbie Messmer
(804) 516-5773
Debbie.Messmer@VDEM.virginia.gov

Southeast Shakes: Looking Back at the 2020 Sparta, NC Earthquake

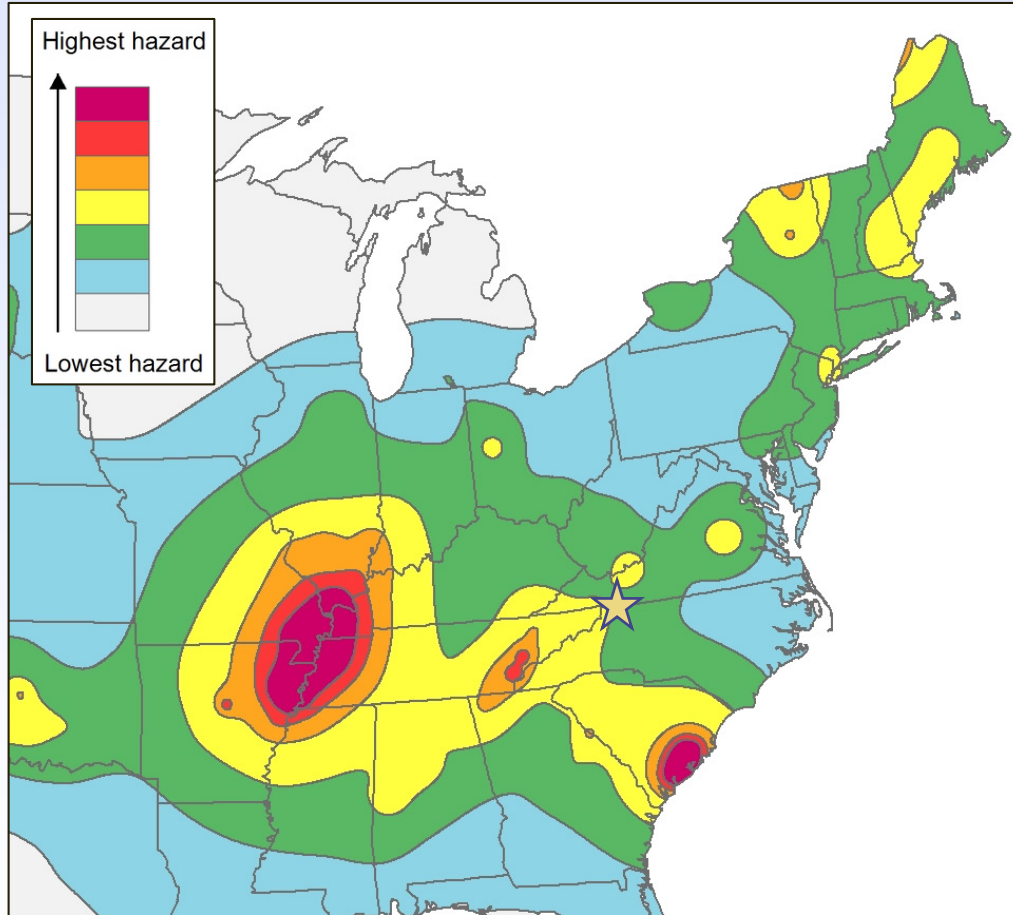
June 17, 2021

NCEM BRANCH MANAGEMENT

- The town of Sparta is located in Alleghany County
- Alleghany County Population: ~11,000

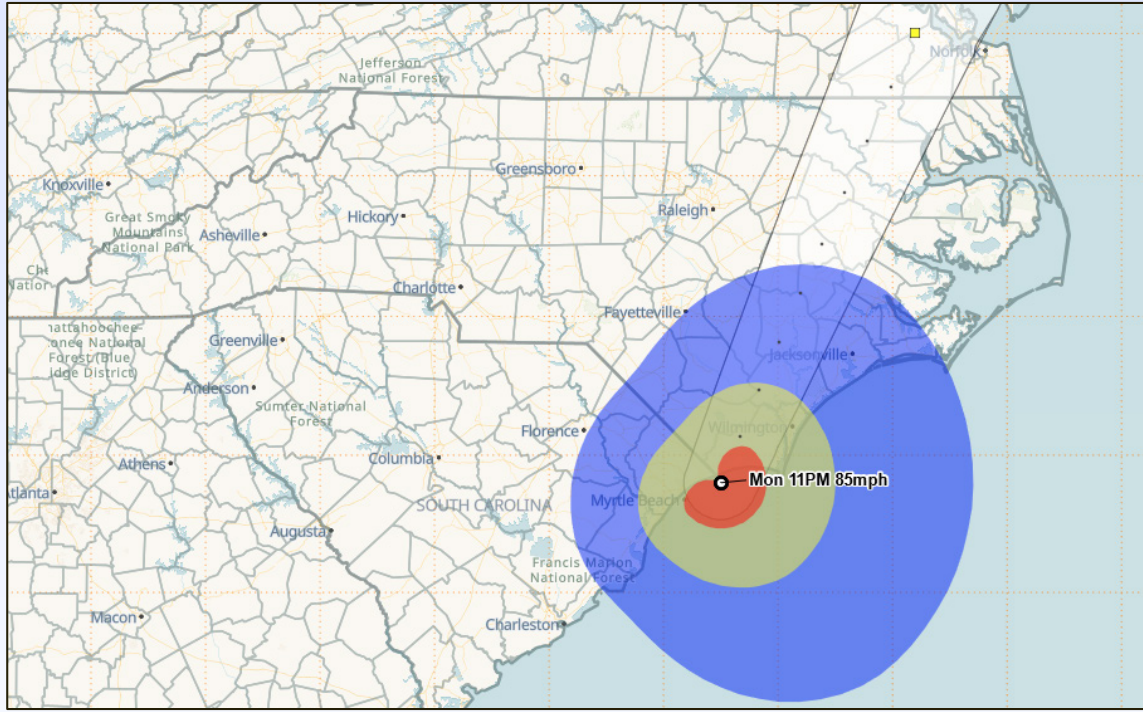


NORTH CAROLINA EARTHQUAKES



- 22 damaging earthquakes 1735-2019
- Greatest damage from the 1861 Wilkesboro, NC; 1886 Charleston, SC; 1916 Asheville, NC earthquakes
- Last damaging earthquake centered in NC was in 1981 (M3.5)

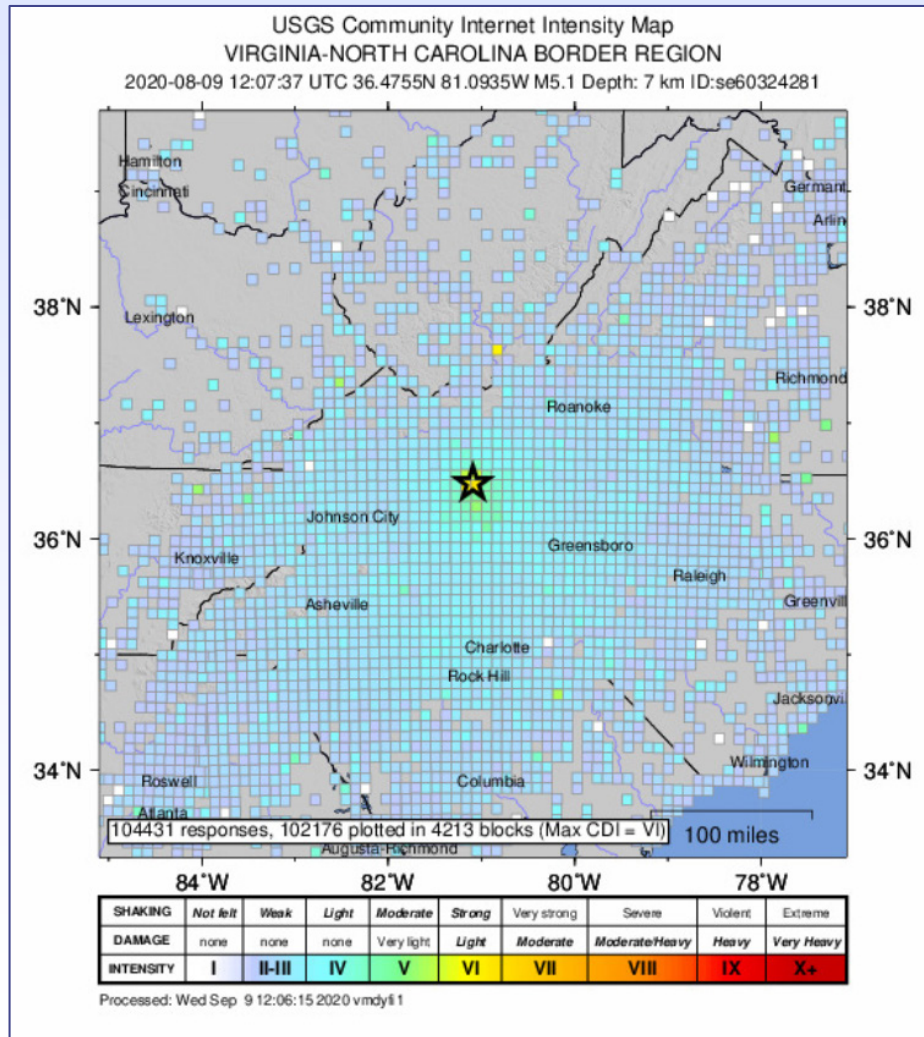
AUGUST 3-4, 2020



- Hurricane Isaias made landfall in SE NC
- 13 tornadoes (1 EF-3 tornado resulting in 2 fatalities and 14 injuries)
- 3-6' of storm surge inundation
- >375,000 without power
- COVID-19 Response & RNC Planning Ongoing



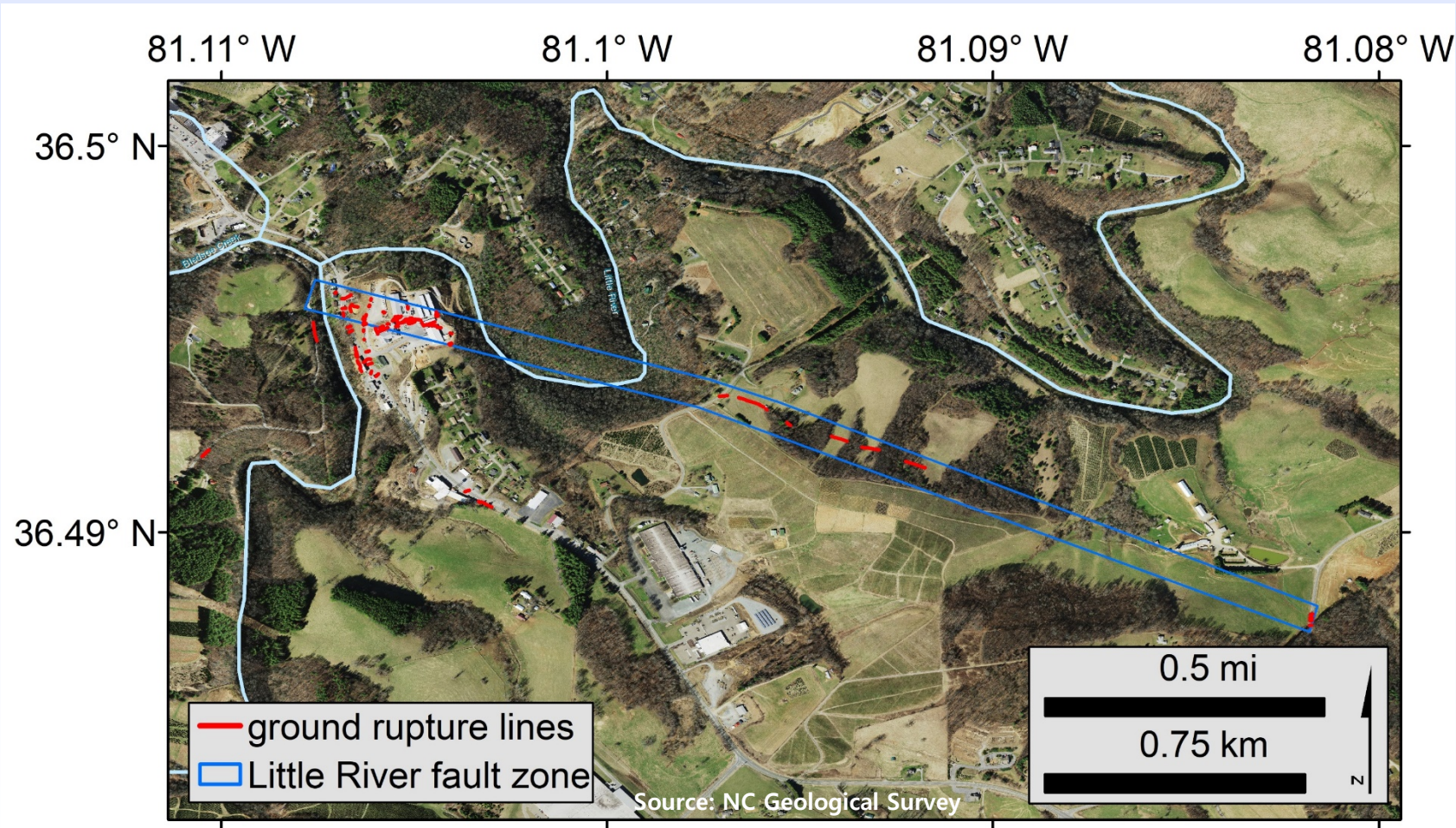
AUGUST 9, 2020 – 8:07 AM



- **USGS “Did you feel it?”**
~80,000 responses within 24 hours
- M5.1, Intensity = **VI**
- Strong shaking; Light damage
- **No fatalities or serious injuries**
- 5 foreshocks; several hundred aftershocks (continue today)
- More responses south of epicenter
- >550 reports of damage to houses and commercial buildings

LITTLE RIVER FAULT

First documented surface rupture of modern fault in the SE US



CHIMNEY DAMAGE



Photo Credit: NC Geological Survey



Photo Credit: NC Geological Survey

CRACKED FOUNDATIONS



DAMAGE TO INFRASTRUCTURE



Photo Credit: NC Geological Survey

- Water main breaks / service line interruptions
- Buckled roads
- DOT reported damage at 7 sites

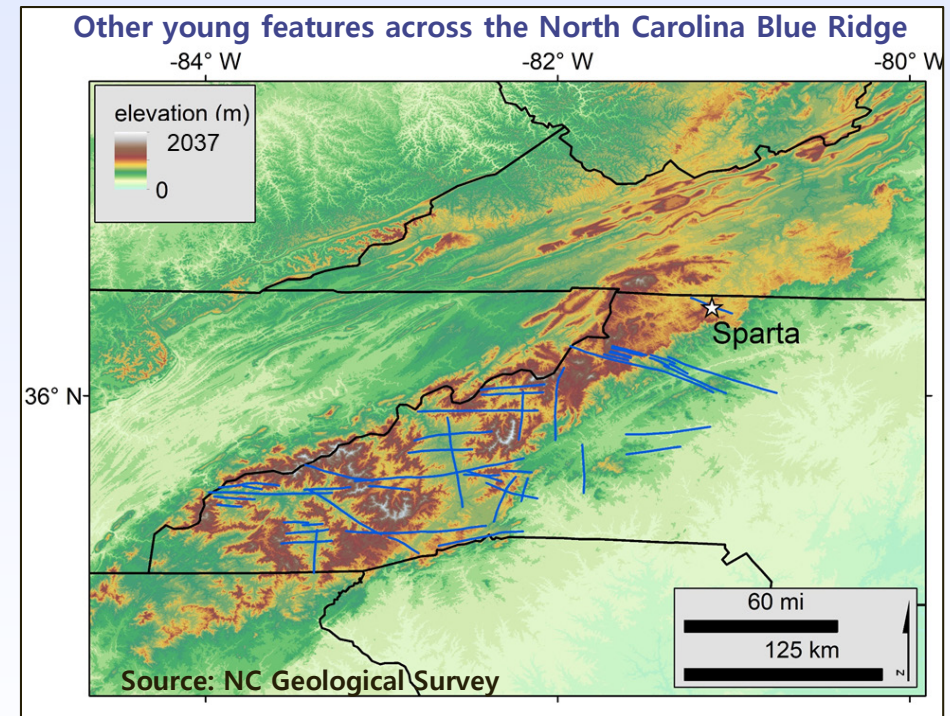
NCEM RESPONSE



- 2 Area Coordinators sent to Alleghany County
- Coordinated USAR Structural Engineers and OSFM Building Inspectors/Structural Engineers for damage assessments
- SBA and State Type I Individual Assistance Declaration approved on August 28th
- The Red Cross assisted individuals with non-congregate care housing

LESSONS LEARNED/BEST PRACTICES

- An unfamiliar situation
- Resources could be limited
- Most damage was not immediately apparent
- Quickly transitioned to a damage assessment event - Survey123 was very flood specific for damage assessment teams
- Meet with State Geologist/Seismologist
- Continue earthquake education and trainings



State Update Presentations

- Nevada – Janell Woodward
- North Carolina – Kevin Kalbaugh
- Puerto Rico – Sarimar Hiraldo
- South Carolina – David Thachik
- Guam – Leo Espia
- Tennessee – Adam Stewart



2021 NATIONAL EARTHQUAKE PROGRAM MANAGERS MEETING

--- BREAK ---

Please RETURN to the meeting promptly @ 1:30PM CDT

Partner Presentations

- Federal Alliance for Safe Homes (FLASH)
- Southern California Earthquake Center (SCEC)
- Western States Seismic Policy Council (WSSPC)

Using & Contributing to FEMA's Protective Actions Research



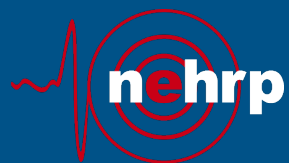
Christi Collins
FEMA Headquarters



Moira Corcoran
FEMA Headquarters



FEMA



NATIONAL EARTHQUAKE PROGRAM MANAGERS MEETING

Using and Contributing to FEMA's Protective Actions Research

Christi Collins

Preparedness Behavior Change Branch Chief

Moira Corcoran

Emergency Management Specialist



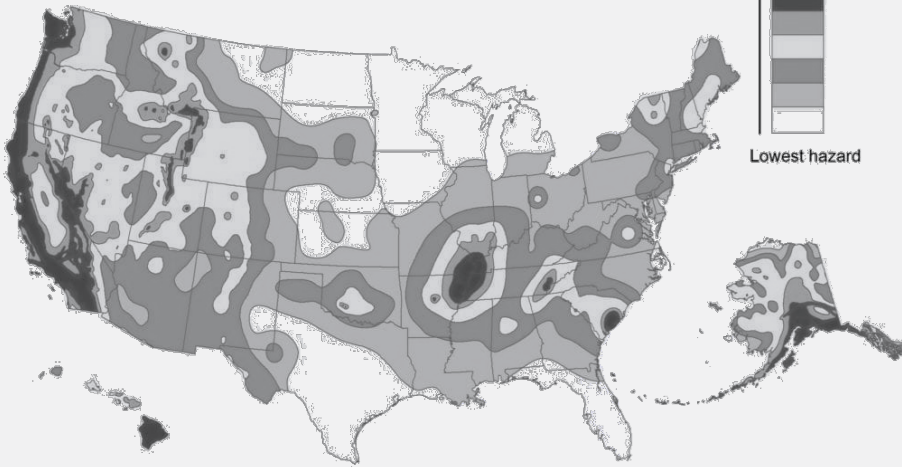
People who have read, seen, or heard preparedness information are more likely to prepare.

In 2020, **47 percent** of people had read, seen, or heard information about how to prepare,

and **47 %** of households had taken three or more preparedness actions.



All 50 States and U.S. Territories are susceptible to earthquakes...



...however, Midwestern and Southern dwellers tend to be much less prepared.

80% of people do not know to drop, cover, and hold on during an earthquake.

Protective Actions Research

Know the **right time** to take action:



Robust/Sufficient

Not Robust/Conditional

Insufficient

Each action has a **validity rating**, determined by the number of studies, quality, relevance, and consistency of available **research**.

Protective Actions Research Site

Preparedness starts with you. A culture of preparedness is built through collaboration with the whole community.



Expand your knowledge about the best ways to prepare for, keep safe during, and recover from disasters.



Get information to help **develop individualized messaging** for specific disaster scenarios.



Read the research behind FEMA's Protective Actions and Ready.gov messaging.



Cite and reference FEMA's transparent, open Protective Actions research.



Contribute to the preparedness research conversation by using the "Contact ICPD" button to share research, questions, and articles.

 [Contact ICPD](#)



Collaborate with FEMA by researching the recommended research questions.



FEMA

National Earthquake Program Managers Meeting | Using and Contributing to FEMA's Protective Actions Research



Group photo time --- Cameras on!



State Update Presentations

- Oklahoma – Bonnie McKelvey
- Utah – John Crofts
- Vermont – Julia Boyles
- Virgin Islands – Regina Brown
- Washington – Maximilian Dixon
- Wyoming – Seth Wittke

NEPM Class of 2021





2021 NATIONAL EARTHQUAKE PROGRAM MANAGERS MEETING

--- BREAK ---

Please RETURN to the meeting promptly @ 3:15PM CDT

Responding to an Earthquake During a Pandemic

M5.7 -- Magna, Utah -- March 18, 2020



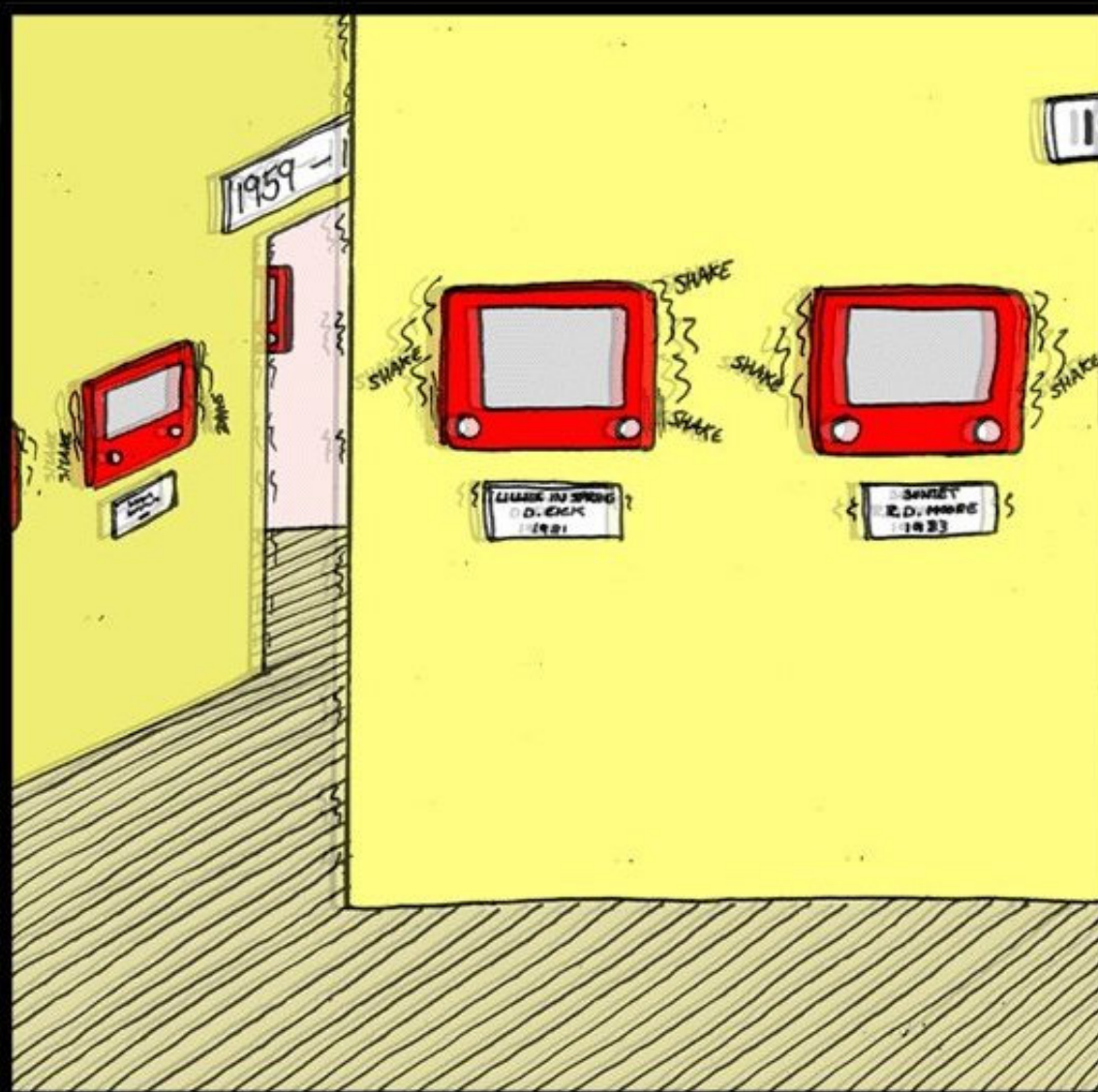
Bob Carey
Utah



Responding to an Earthquake During a Pandemic – Magna M5.7, March 18, 2020

National Earthquake Program Managers Meeting
Virtually Everywhere
June 17, 2021

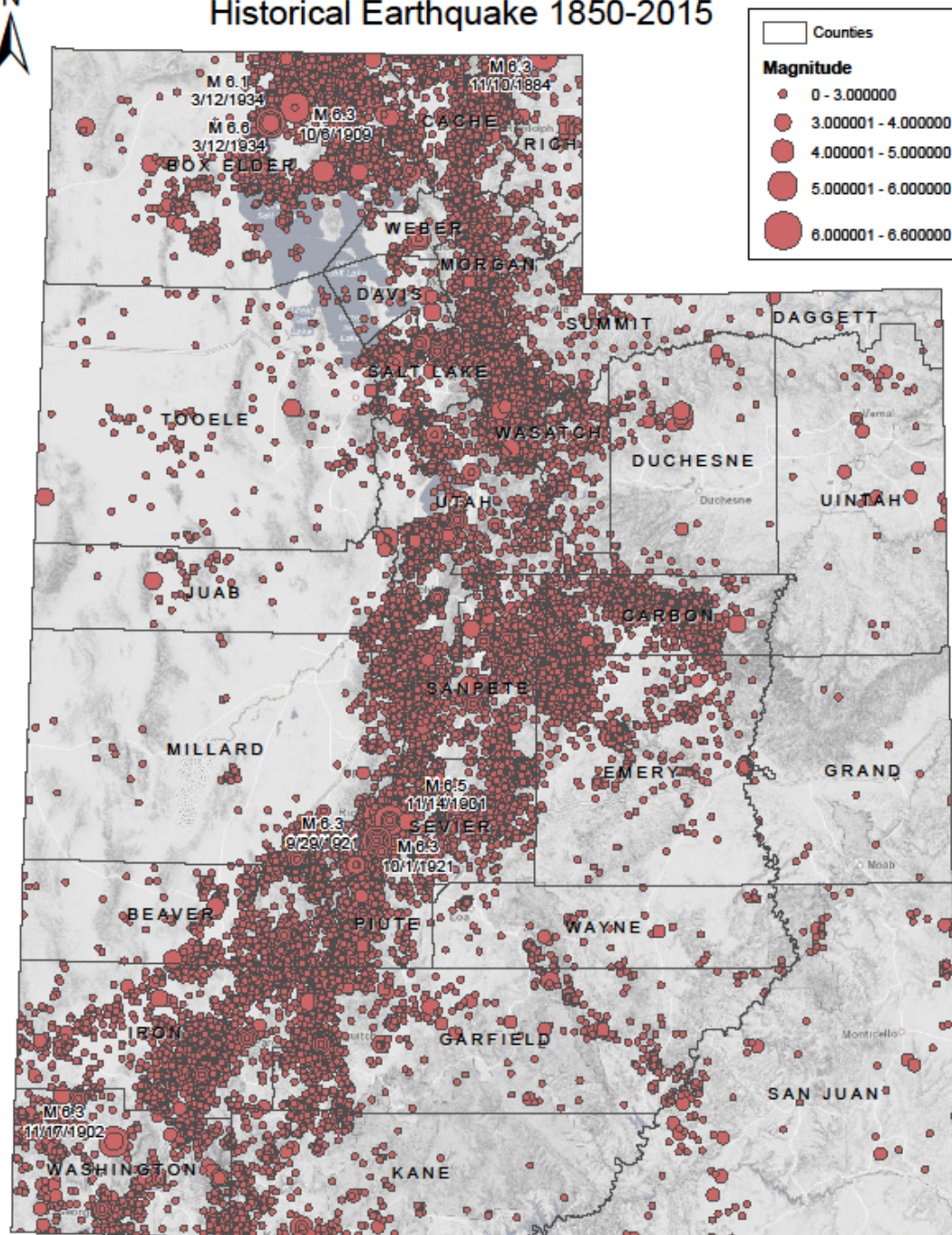
Bob Carey, Bureau Chief
Utah Division of Emergency Management



IT WAS ONLY A MINOR EARTHQUAKE, BUT
THE ETCH-A-SKETCH GALLERY WAS RUINED



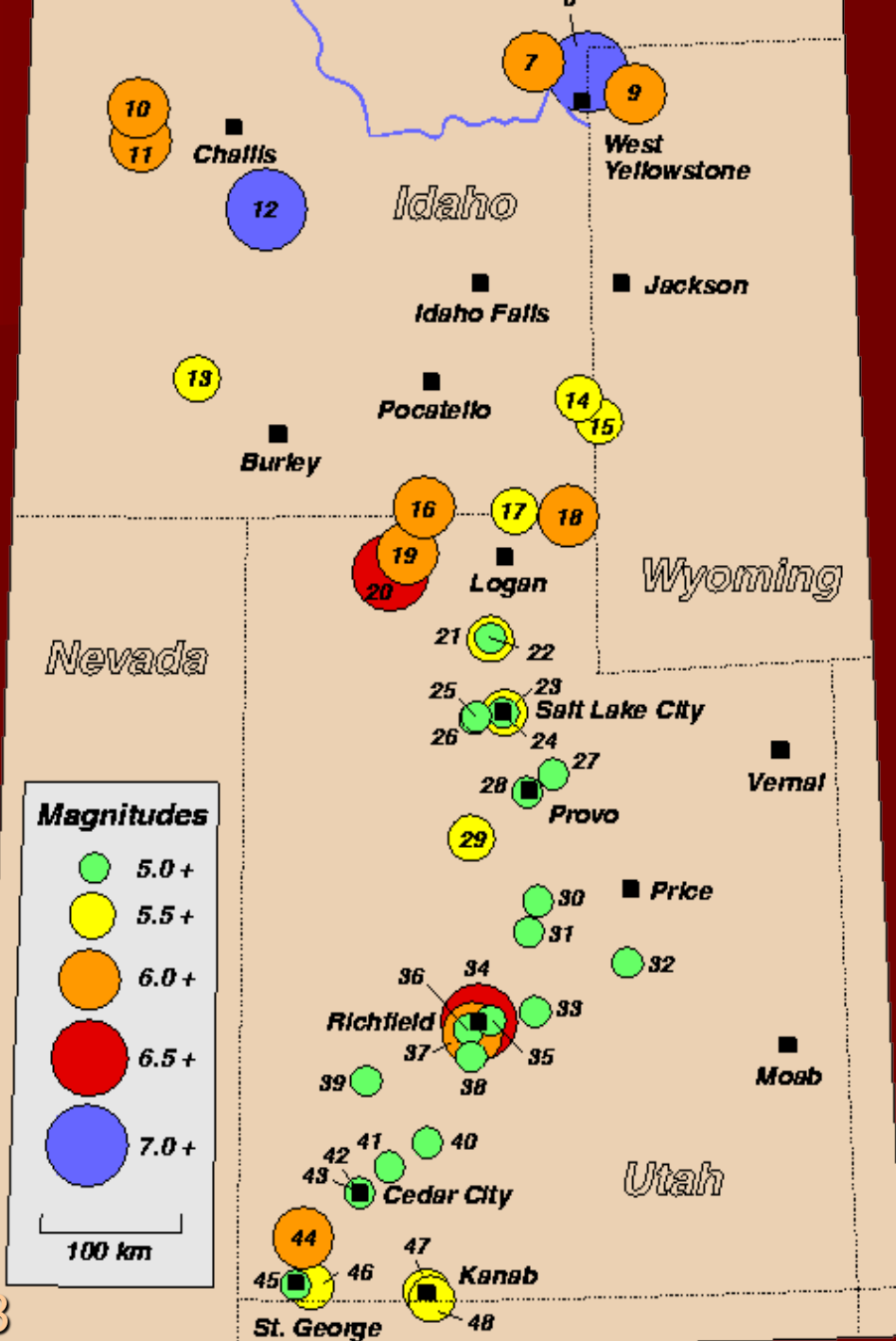
Historical Earthquake 1850-2015



Data Source: the University of Utah Seismograph Stations, the Utah Automated Geographic Reference Center

Intermountain Seismic Belt

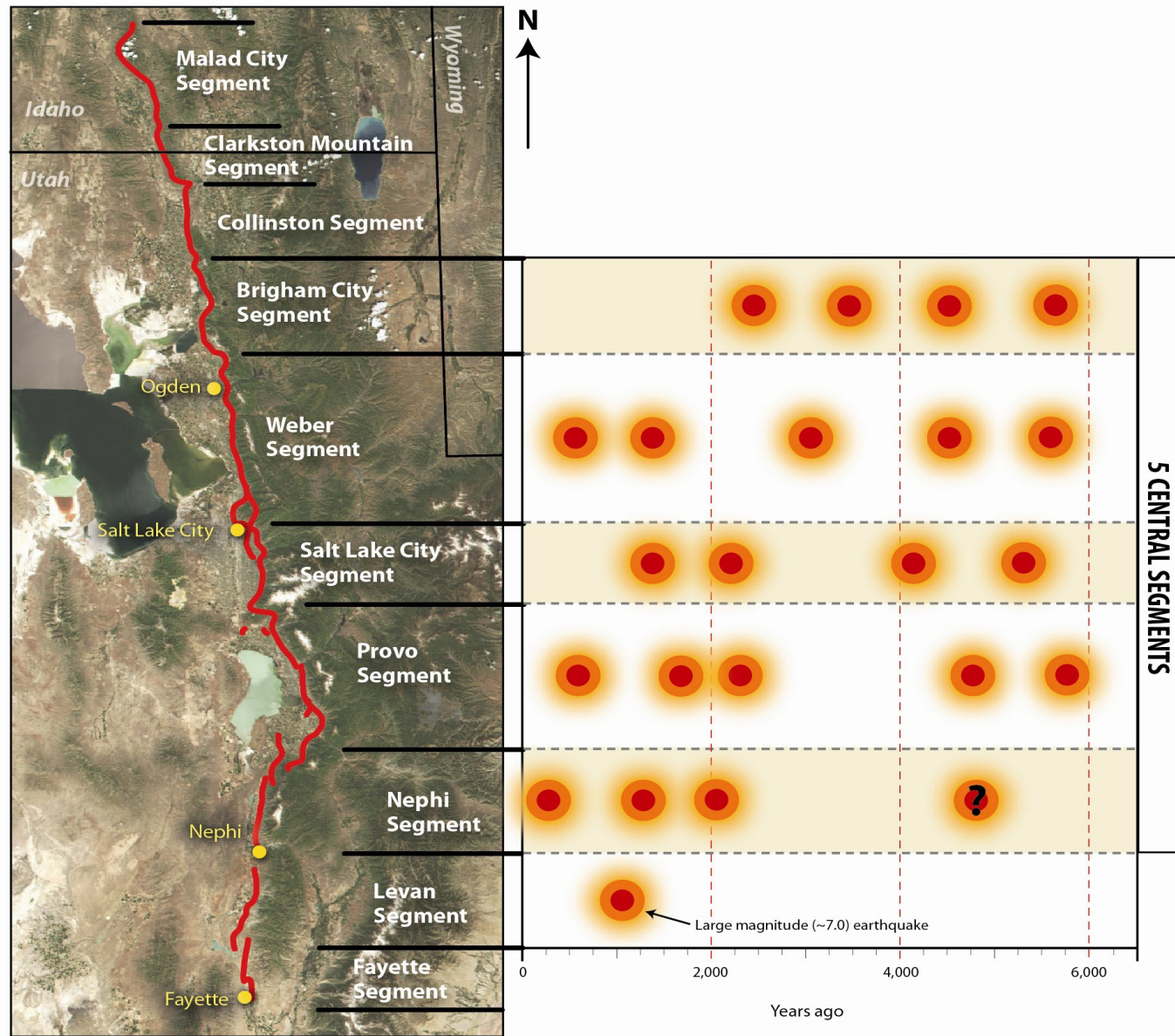
16. 1975 Pocatello, Idaho M6.0
17. 1962 Cache Valley, Utah M5.7
18. 1884 Bear River, Idaho M6.3
19. 1909 Hansel Valley, Utah M6.0
20. 1934 Hansel Valley, Utah M6.6
21. 1914 Ogden, Utah M5.5
22. 1894 Ogden, Utah M5.0
23. 1910 Salt Lake City, Utah M5.5
24. 1949 Salt Lake City, Utah M5.0
25. 1943 Magna, Utah M5.0
26. 1962 Magna, Utah M5.2
27. 1958 Wallsburg, Utah M5.0
28. 1915 Provo, Utah M5.0
29. 1900 Eureka, Utah M5.5
30. 1876 Moroni, Utah M5.0
31. 1961 Ephraim, Utah M5.0
32. 1988 San Rafael Swell, Utah M5.3
33. 1989 S. Wasatch Plateau, Utah M5.8



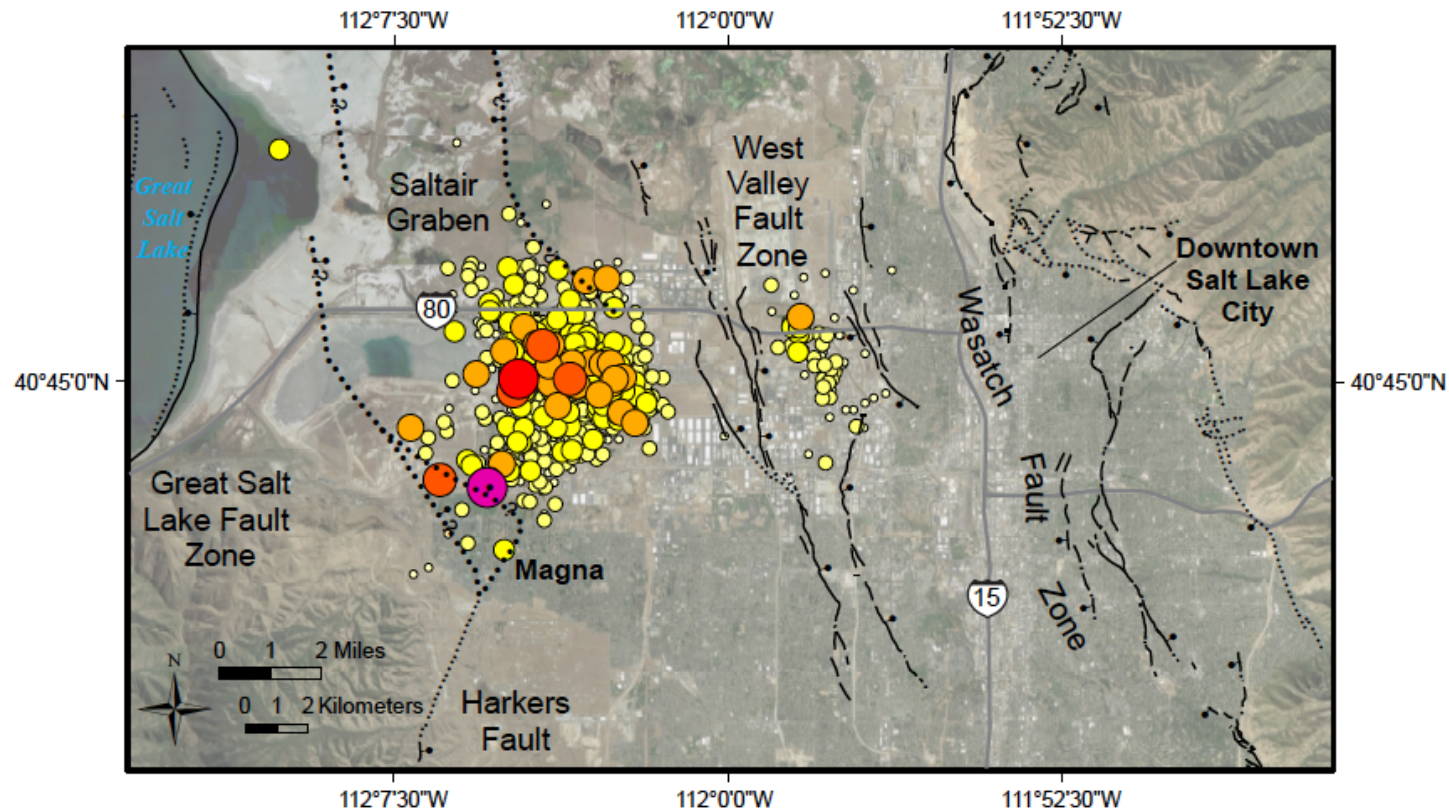
Hansel Valley – 1934 M 6.6



Wasatch Fault Zone



Generalized Map of Northern Salt Lake Valley Showing Normal Faults and Their Relation to the Magna M 5.7 Earthquake and Aftershocks of March 18–May 8, 2020



**Quaternary (<2.6 million years)
Active Faults**
(bar and ball on downthrown side of fault)

- Inferred
- Moderately Constrained
- Well Constrained

**Faults Inferred from Drill Hole,
Gravity, and/or Seismic Data**

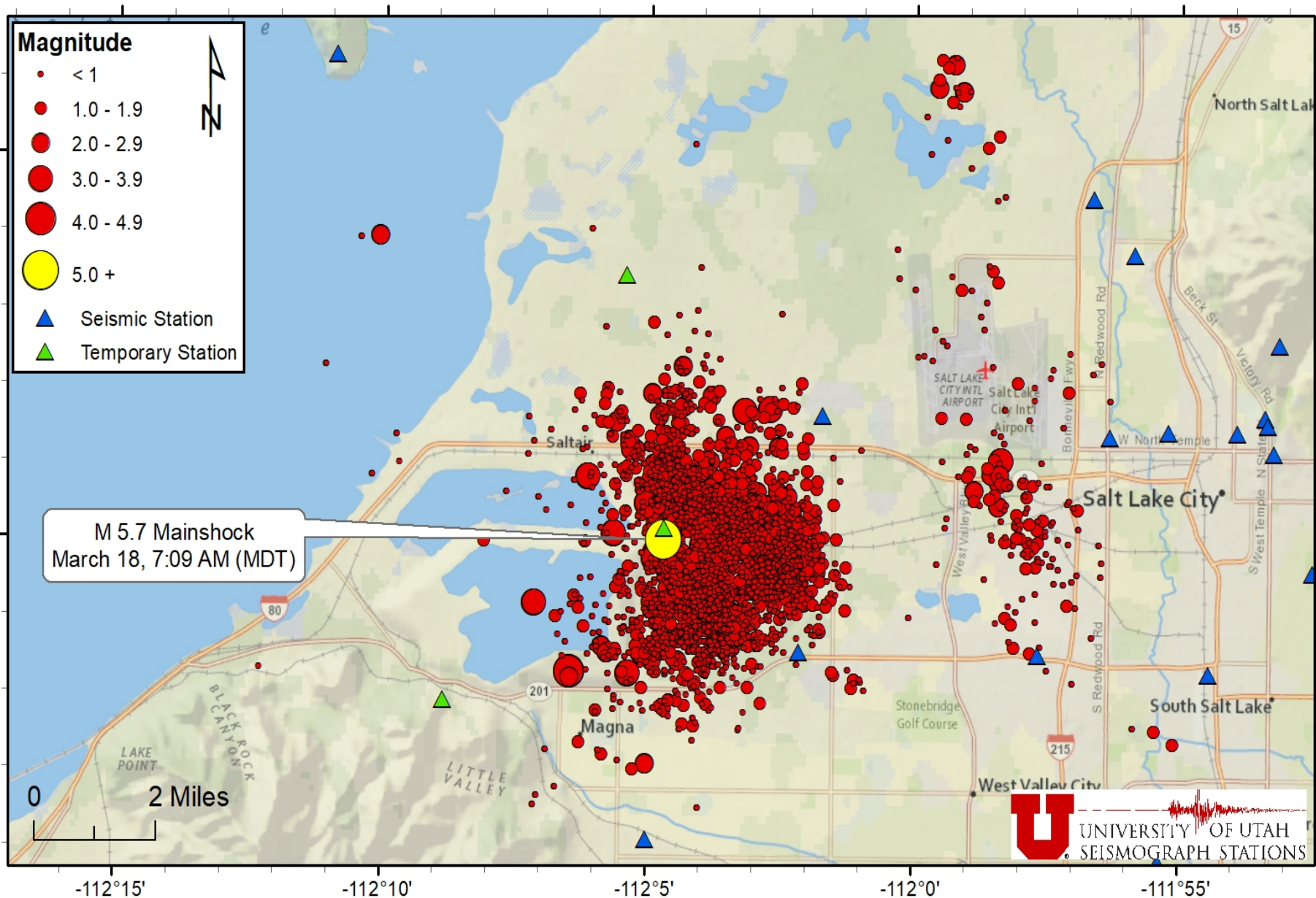
- Inferred (New)

**USGS/UUSS 2020 Magna Earthquake
Record (as of 5/8/2020)**
Magnitude

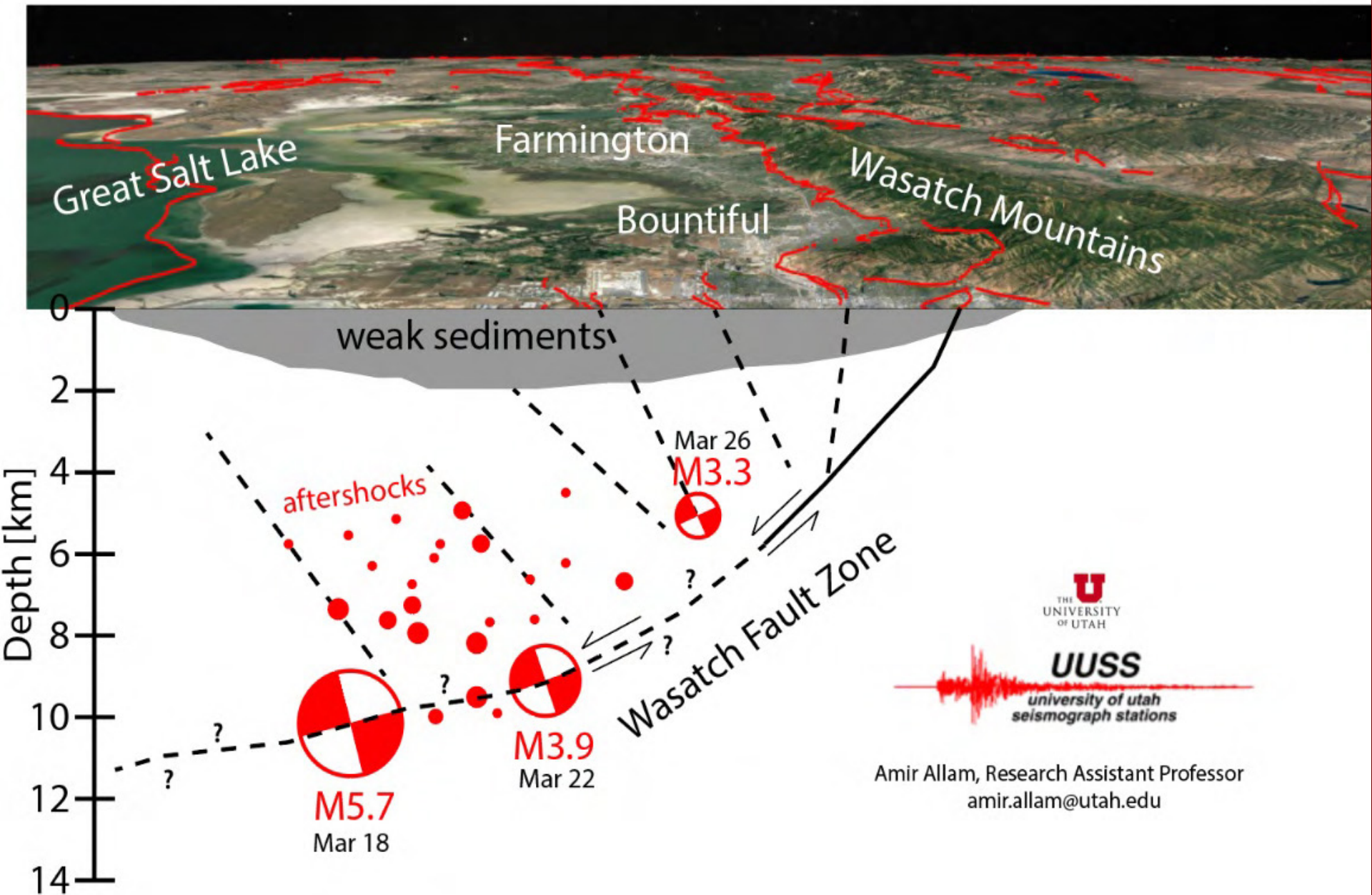
- 0–1.0
- 1.0–2.0
- 2.0–3.0
- 3.0–4.0
- 4.0–5.0
- 5.0–6.0
- 9/5/1962 Magna Earthquake (M 5.2)

Recent seismicity near Magna, Utah

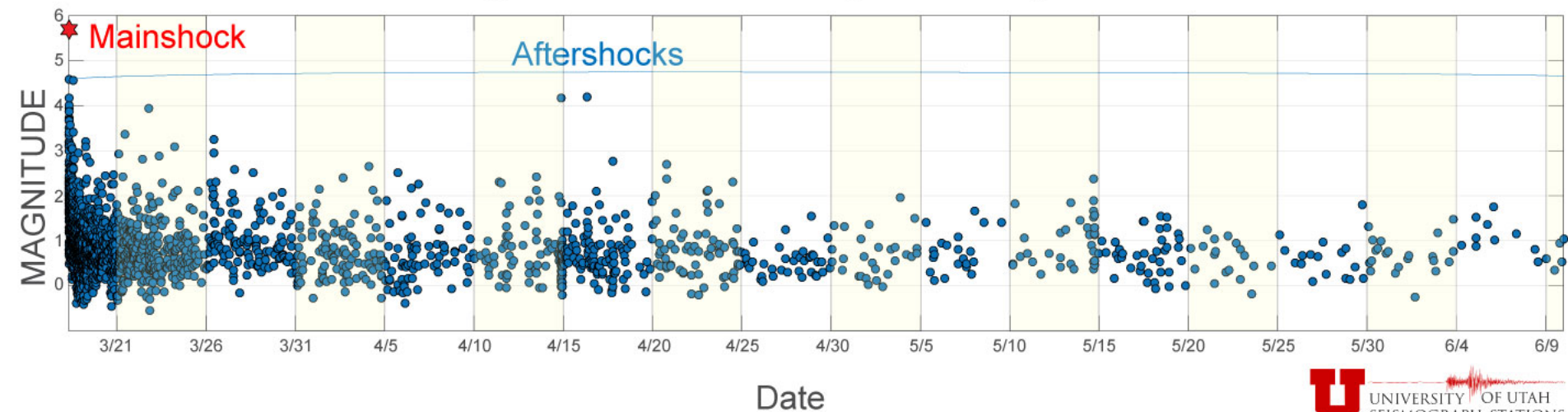
March 18 - September 18 (11AM MDT), 2020



Wasatch Fault Zone Schematic

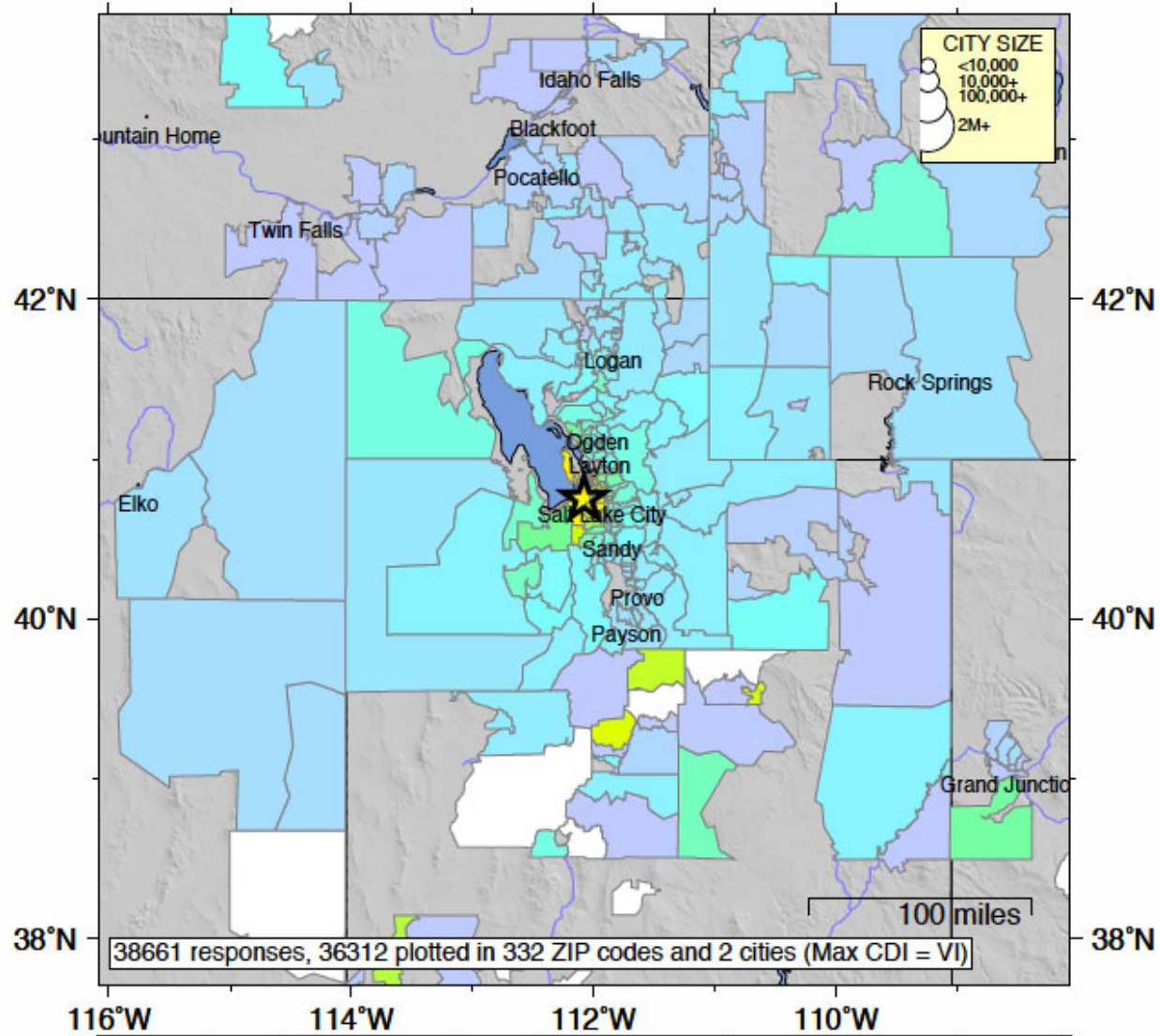


Magnitude vs Time Magna Earthquakes



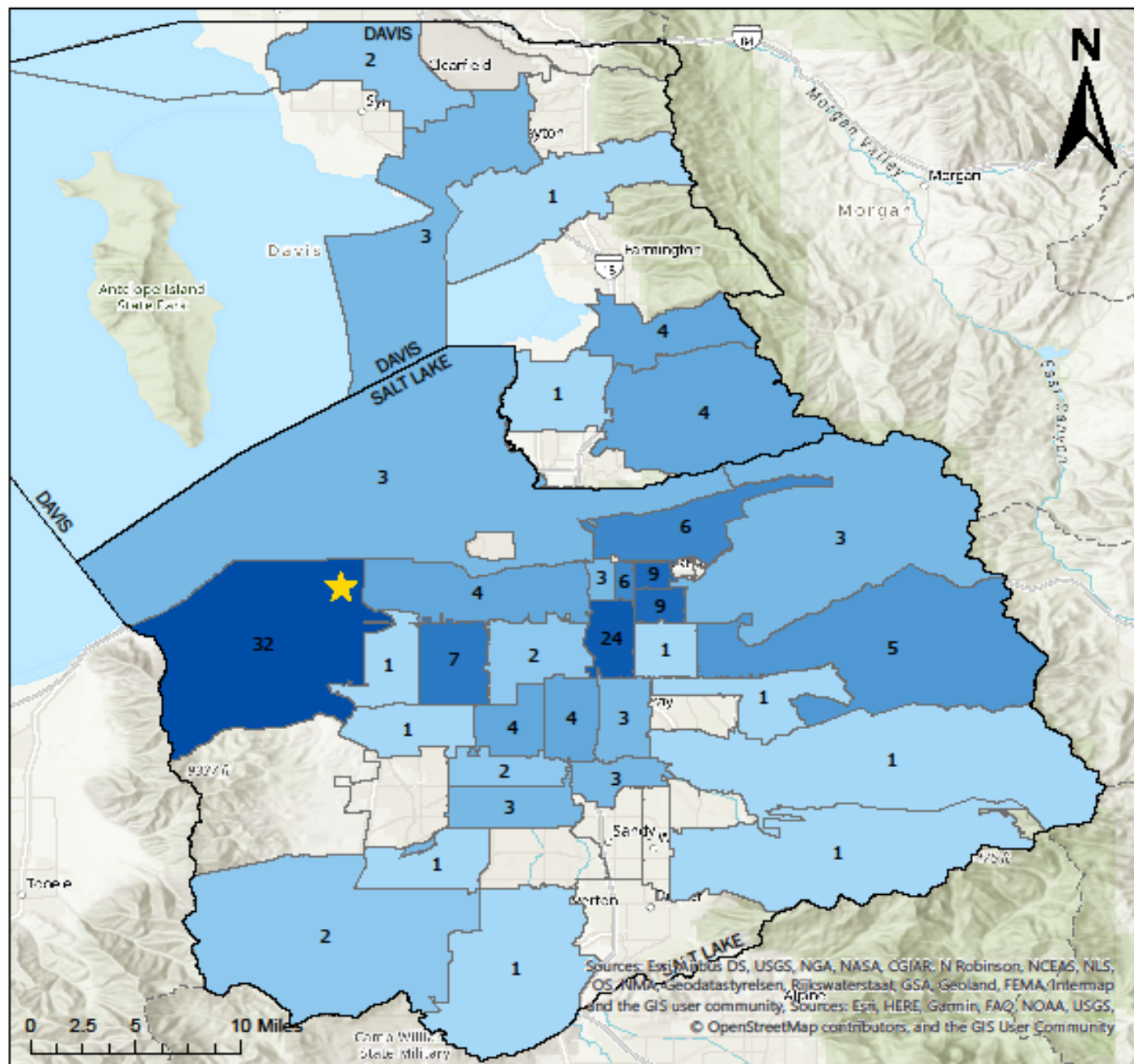
USGS Community Internet Intensity Map WASATCH FRONT URBAN CORRIDOR, UTAH

2020-03-18 13:09:31 UTC 40.751N 112.0783W M5.7 Depth: 11 km ID:uu60363602



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
INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Processed: Mon Jul 20 01:28:17 2020 vmdyfi1











2540 E. 1700 S. Chimney braced; no damage. Adjacent houses lack braces but are not



damaged. 3/22/2020 (below)







UGS Office



UGS Office



Challenges



Press Conference on 5.7 magnitude earthquake



Watch later



Share



MORE VIDEOS



Challenges

- Pandemic
- Hazardous Material Release
- Building Safety Evaluation
- Collecting Damage Data
- Understanding Eligible Costs
- Wind Event
- 5 FMAGs

Smaller Earthquakes

“With Ambition”

M5.8 Mineral Earthquake

PA/IA \$60.1M – DR-4042-VA

M5.7 Magna Earthquake

IA \$1.1M – DR-4548-UT

PA \$152.3M from 125 PWs – UDEM

SBA \$2.3M – UDEM

HAZUS Capitol Stock \$534.5M, Income \$77.9M

M6.0 Wells Earthquake

Est. \$10.6M – NBMG Pop.1600+

Questions



Special Thanks to the 2021 NEPM Co-Chairs



Jeff Briggs - Chair
Missouri



Janell Woodward – Chair-Elect
Nevada

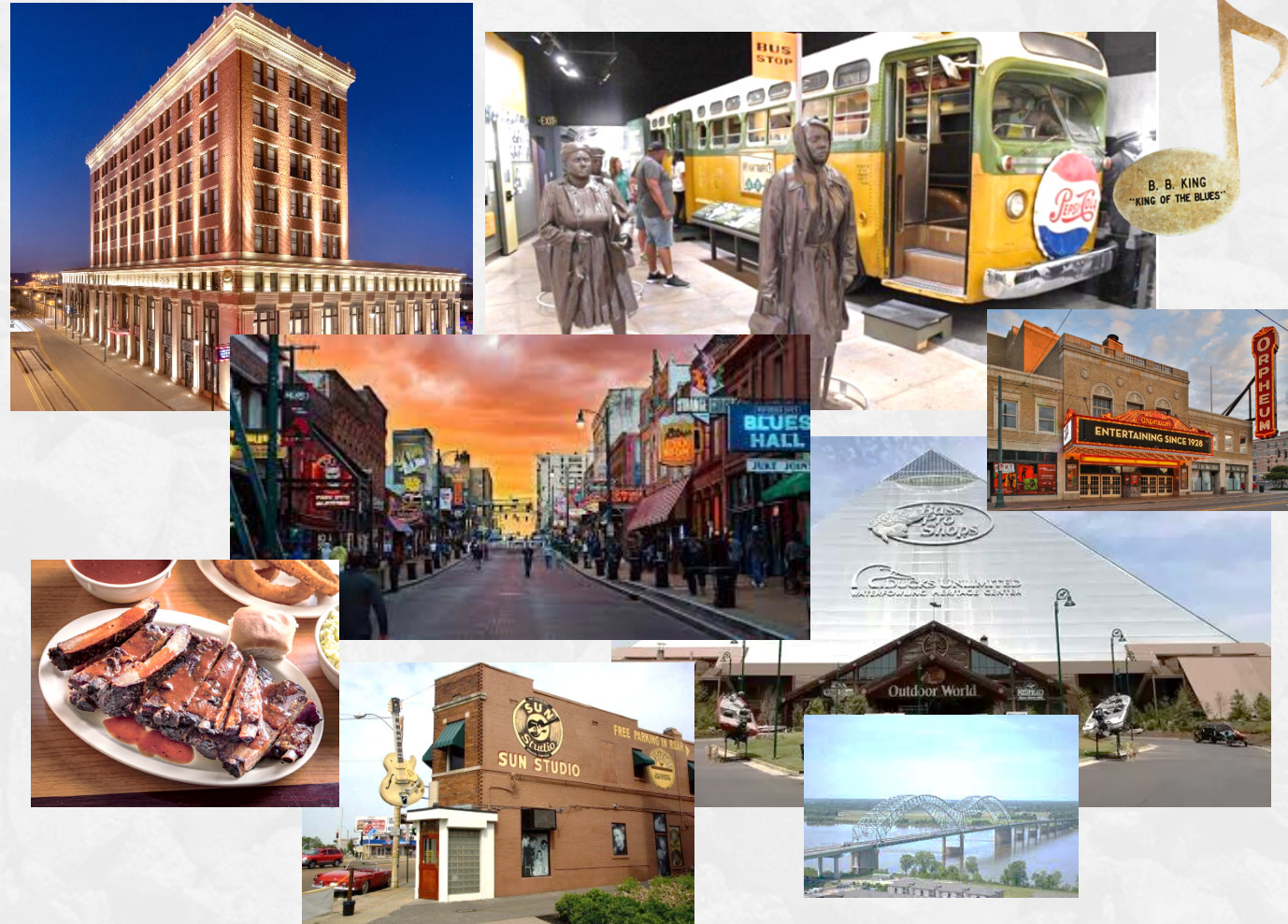
And to the NEPM Organizing Committee!

- Brian Blake, CUSEC
- Hilda Booth, AR
- Bob Carey, UT
- John Crofts, UT
- Maximilian Dixon, WA
- Jon Foster, FEMA
- Ed Fratto, NESEC
- Scott Gauvin, IL
- Kevin Kalbaugh, NC
- Pascal Schuback, CREW
- Amanda Siok, FEMA RX
- Adam Stewart, TN
- Matthew Wall, WSSPC
- Jim Wilkinson, CUSEC

*Special thanks to **Creative Engagement Solutions** for their technical and administrative support!*

Selection of 2021-22 NEPM Chair & Committee

- 2022 NEPM Meeting
- Memphis, TN
- March 29-31, 2022
 - Tues. – Thurs.



2021 NEPM Follow Up

- Meeting Notes & Roster
- Presentations
- Video Recording(s)
- Post-meeting survey





2021 NATIONAL EARTHQUAKE PROGRAM MANAGERS MEETING

--- OPEN DISCUSSION // END OF MEETING---