2021 Northern California Earthquake Hazards Workshop
February 2-4, 2021
USGS, virtual from Menlo Park, California
Pacific Standard Time (UTC-8)

AGENDA

Day 1, Tuesday, February 2

9:15-10:00 a.m. **Welcoming Remarks**

Steve Hickman, Earthquake Science Center Director (USGS)
Keith Knudsen, Northern California Earthquake Hazards Coordinator (USGS)
Sarah Minson, Workshop Overview (USGS)
John Grindle, Workshop Format (Grin Events)

10:00-11:45 a.m. **Disparate Hazard and Risk**

Speakers [15 min each]:

Dave Applegate (USGS) *Community-focused science for disaster risk reduction.*
Laurie Johnson (Laurie Johnson Consulting | Research, and California Earthquake Authority) *Disparate patterns of displacement and long-term recovery challenges following a major earthquake in Northern California: Insights from the communities at risk analysis of the HayWired Scenario*
Ana-Marie Jones (Interpro, Inc.) *Unequal Risks and the Diversity Solution*
Alessandra Jerolleman (Jacksonville State University) *Towards a More Just Recovery: Reducing Disparities in Disaster Recovery Outcomes and Hazard Mitigation*

Discussion: 45 min
Moderators: **Mark Benthien** (SCEC, Earthquake Country Alliance), **Keith Knudsen** (USGS)

11:45 a.m.-1:00 p.m. **Break**

1:00-3:00 p.m. **Advances in Computation and Instrumentation**

Speakers [15 min each]:

Clara Yoon (USGS) *The potential of machine learning to modernize earthquake monitoring*
Greg Beroza (Stanford) *Deep Learning for Earthquake Science*
Noha Farghal (USGS) *The Potential of Fiber-optic Distributed Acoustic Sensing in Earthquake Early Warning*
Rufus Catchings (USGS) *The New USGS 3C Nodal Seismographs and Facilities*
Heather Savage (UCSC) *History of earthquakes along the creeping section of the San Andreas fault*
Kevin Milner (USC) *Operational Earthquake Forecasting with UCERF3-ETAS: Lessons Learned from the 2019 Ridgecrest Sequence and Implications for Future UCERFs*

Discussion: 30 min
Moderators: **Annemarie Baltay** (USGS), **Taka'aki Taira** (Berkeley)

3:00-3:15 p.m. **Break**

3:15 p.m.-4:00 p.m. **Lightning Talks: Everything You Want to Know About Current Earthquake Research in N. California!**
Janet Watt, Jenna C. Hill, Nora Nieminski, Rachel Abercrombie, Travis Alongi, Annemarie Baltay, Christie Rowe, Larry Collins, Jonathan Delph, Lori Dengler, Benchun Duan
Moderator: Sarah Minson (USGS) [1 slide and 3 min per speaker]

4:00-5:00 p.m. **Breakout Rooms: Random Roulette**

5:00 p.m. **Adjourn day 1**

Welcome to the U.S. Geological Survey.
We serve the Nation by providing reliable scientific information. The USGS strives to provide a diverse, inclusive, and respectful environment because it is essential to the integrity of our organization and our science. If anything fails to exemplify these ideals, please alert an organizer for immediate assistance.

Day 2, Wednesday, February 3

9:00-10:15 a.m. **Swarms of Swarms**

Speakers [15 min each]:

Andrea Llenos (USGS) *It's swarmy outside: Developing swarm earthquake forecasting methods*

Alicia Hotovec-Ellis (USGS) *Why do swarms happen? A brief review of what we know about swarm physics*

Doug Dreger (UC Berkeley) *Moment tensors, state of stress, finite-source scaling and pseudo fracture network from micro earthquakes at the Geysers, CA*

Discussion: 30 min

Moderators: **Ole Kaven** (USGS), **David Shelly** (USGS)

10:15-10:30 a.m. **Break**

10:30-12:00 p.m. **Frontiers of Northern California Earthquake Hazards Research**

Speakers [15 min each]:

Steve DeLong (USGS) *Research challenges from the coast to the Delta: Understanding hazard from partially creeping and "secondary" faults*

Kim Blisniuk (SJSU) *Holocene slip rates in the Santa Cruz Mountains reveal temporal and spatial consistency along the Northern San Andreas Fault, CA*

Chelsea Scott (ASU) *Aseismic Deformation Along the Central San Andreas and Calaveras Faults From Differencing Repeat Airborne Lidar*

Mike Oskin (UC Davis) *Geological slip rate and earthquake potential of the West Napa fault*

Discussion: 30 min

Moderators: **Tim Dawson** (CGS), **Steve Thompson** (LCI)

12:00 p.m.-1:00 p.m. **Break**

1:00 p.m.-2:30 p.m. **North Coast Tectonics**

Speakers [15 min each]:

Sam Johnson (USGS) *The Northern San Andreas Fault - A Coastal and Marine Perspective*

Lori Dengler (Humboldt State University) *The 1906 earthquake on California's North Coast*

Kathryn Materna (USGS) *Quantifying rates of interseismic deformation on faults near Humboldt Bay, Southern Cascadia*

Bob McPherson (Humboldt State University) *Where Broken Plates Meet: The MTJ*

Discussion: 30 min

Moderators: **Jay Patton** (CGS), **Carol Prentice** (USGS emeritus)

2:30 p.m.-3:45 p.m. **Lightning Talks: Everything You Want to Know About Current Earthquake Research in N. California!**
Austin Elliott, Manuel Florez, Alice Gabriel, Yann Gavillot, Chris Goldfinger, Jianhua Gong, Jared Gooley, Mike Greenfield, Alex Hatem, Suzanne Hecker, Don Hoirup, Samuel Bold, Tyler Ladinsky, also Tyler Ladinsky, Jay Patton, Irene Liou, John Louie
Moderator: Sarah Minson (USGS) [1 slide and 3 min per speaker]

3:45 p.m. - 4:45 p.m. **Breakout Rooms: Topical Questions**

Questions:

1. What do we need to reduce uncertainties in hazard estimates? Are there data sets or models that we are missing?
2. How can we better forecast how far ruptures could propagate?
3. How can we remediate issues of disparate hazard and risk?
4. What new methods or data or products need to be integrated into operations?
5. What Earth features do we need to study to understand the propagation of ground motions?
6. What should the foci of future event response be (not just earthquake response but also creep events, volcanic unrest, injection activity, etc.)? What kinds of ephemeral measurements do we need to be prepared to make?

4:45 p.m. **Adjourn day 2**

Day 3, Thursday, February 4

9:00 a.m.-10:15 a.m. **Sights on Site-Specific Shaking**

Speakers [15 min each]:

Domniki Asimaki (Caltech) *A sediment velocity model for the simulation of basin amplification effects in Southern California*

Sean Ahdi (USGS, UCLA) *Why We Are Still Using VS_{30} for Seismic Site Characterization*

Valerie Sahakian (University of Oregon) *Bay Area site effects from Kappa and Site Spectral Parameters*

Discussion: 30 min

Moderators: **Alex Grant** (USGS), **Grace Parker** (USGS)

10:15-10:30 a.m. **Break**

10:30-11:45 a.m. **Northern Maacama Seismicity and Creep**

Speakers [15 min each]:

Harvey Kelsey (Humboldt State University) *Northern Maacama fault: lidar-based fault trace geometry, active traces vs. seismicity, and summary of paleoseismic data*

Felix Waldhauser (Lamont-Doherty Earth Observatory) *Real-time precision seismology on the Maacama Fault*

Gareth Funning (UC Riverside) *Creep and fault complexity on the Maacama fault from InSAR and repeating earthquakes*

Discussion: 30 min

Moderators: **Stu Nishenko** (PG&E), **Robert Sickler** (USGS)

11:45 a.m.-1:00 p.m. **Break**

1:00-2:45 p.m. **Lightning Talks: Everything You Want to Know About Current Earthquake Research in N. California!**
Max Schneider, Susan Hough, Yihe Huang, David Jackson, Keene Karlsson, Ozgur "Oz" Kozaci, Cynthia Kroll, Valere Lambert, Victoria Langenheim, Danielle Lindsay, Donald Medwedeff, Josie Nevitt, Grace Parker, Tim Parker, Geoff Phelps, Collin Cronkite-Ratcliff, Cynthia Pridmore, Bryan Byrd, Jessie Saunders, David Schwartz, Gordon Seitz, Ramesh Singh, Luther Strayer, Jessica Thompson Jobe, Charles Trexler, Maureen Walton, Anne Wein, Doug Wilson, James Wollbrinck
Moderator: Sarah Minson (USGS) [1 slide and 3 min per speaker]

2:45 p.m. Concluding Remarks, Keith Knudsen

3:00 p.m.-4:00 p.m. **Breakout Rooms: Open Discussion**

4:00 p.m. **Adjourn**