

The Sierra Earthquake Risk Reduction Technical Action Group (SiERRa-TAG)



Rich D. Koehler (UNR), Christie Rowe (UNR), & Ben Mason (UNR),

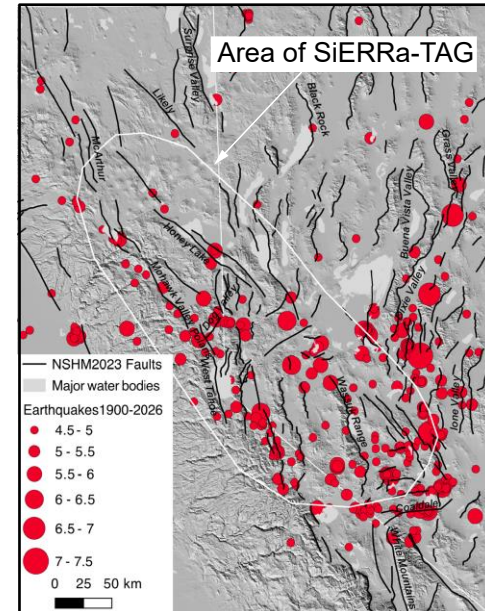
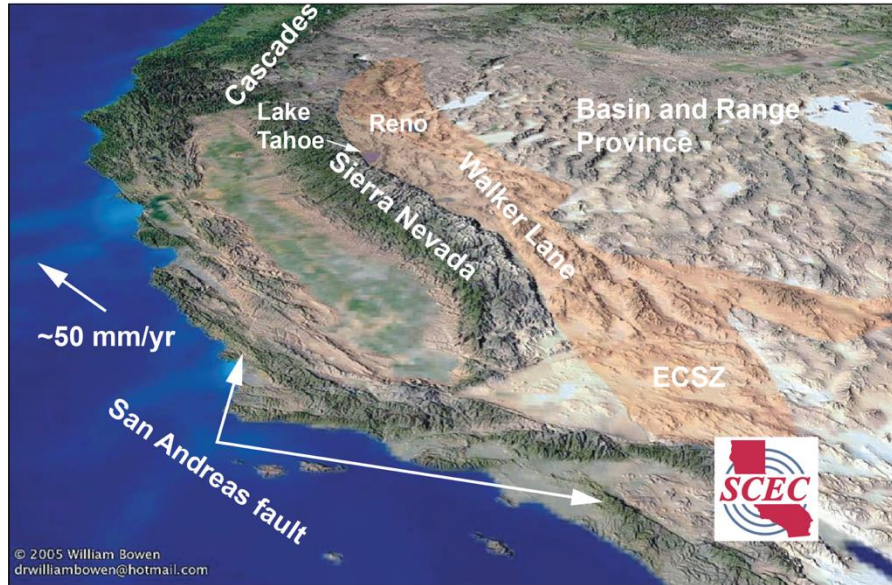
Contributors: UNR: S. Wesnousky, D. Trugman, B. Hammond, C. Kreemer, G. Kent, K. Bogolub, D. Marino, H. Martin, Y. Jiang, M. Zhang, R. Pretell, A. Ductram, E. Seylabi. DRI: K. Rodriguez. USBR: R. Williams. CGS: J. Zachariasen, T. Dawson, G. Seitz. NDWR: K. Conrad. UCD: M. Oskin. UCB: T. Taira, J. Marty, R. Allen. PG&E: C. Madugo, A. Kottke, I. Pierce, O. Kozaci. CDWR: D. Hoirup, C. Carlson, S. Dunbar, A. Tate. LCI: I. Wong. USGS: C. DuRoss, A. Hatem, S. Nicovich. CalTrans: A. Sojourner, D. Brittsan, J. Kaump

September 2, 2026

SCEC Annual Meeting, Palm Springs, California

SiERRa Earthquake Risk Reduction - TAG

- **Problem:** Seismic hazard poorly defined in the northern Walker Lane. Moderate earthquakes are common, but the potential for large damaging events is uncertain.
- Faulting and shaking hazards pose risks for growing population centers and important infrastructure (e.g. hydroelectric, gas and water transmission, dams, and transportation corridors).





SiERRa Earthquake Risk Reduction - TAG

- **Approach:** Establish a collaborative community including earthquake scientists and engineers from federal and state agencies, utilities, and water stakeholders. A 3-day workshop will serve to develop recommendations and priorities for research aimed at improving seismic hazard assessment.
- **Science-to-Practice Opportunities:** The main product will be a “scope of work” white paper addressing regional earthquake hazard data gaps. Focus areas include fault rupture parameters, site characterization, ground motion models, and credible earthquake scenarios.



SiERRA-TAG supports Earthquake System Science by:



Community Invitation: Workshop will occur October 20-22, 2026 at UNR Lake Tahoe Campus. Registration open for two more days. Remote participation will be available.

1. Establishing a team science framework for assessing the state of knowledge and critical data gaps in the northern Walker Lane across the CA/NV border
2. Connecting hazard science with infrastructure and engineering needs through transdisciplinary collaboration
3. Developing an actionable research agenda guided by a work plan to support improvements to community and national hazard models
4. Identifying priority multidisciplinary studies to improve seismic hazard characterization. Student involvement in these studies will contribute to workforce development
5. Strengthening regional earthquake-response coordination, protocols, and data collection standards, ultimately supporting resilience

View poster pdf on line

The Sierra Earthquake Risk Reduction Technical Action Group (SiERRA-TAG)

Rich D. Koehler, Christie Rowe, & Ben Mason,

Group B, Poster #174



The Sierra Earthquake Risk Reduction Technical Action Group (SiERRA-TAG)

Rich D. Koehler¹, Christie Rowe², and Ben Mason³

1 Nevada Bureau of Mines and Geology, UNR, rkoehler@unr.edu
2 Nevada Seismological Laboratory, UNR, rowec@unr.edu
3 Department of Geological Sciences and Engineering, UNR, hbmason@unr.edu

NEVADA SEISMOLOGICAL LABORATORY
UNIVERSITY OF NEVADA, RENO
Nevada Geosciences

2026 SCEC Annual Meeting, Group B poster #174

Abstract

Seismic hazard is poorly defined in the northern Walker Lane along the Nevada-California border zone. Risk is elevated around major dams and growing population centers, with changing water supply/demand and considerable fire risk, there is high potential impact from new research to support multi-hazard planning. The Sierra Earthquake Risk Reduction Technical Action Group (SiERRA-TAG) will establish a new collaborative community including utilities, federal and state agencies, local/municipal water stakeholders, earthquake scientists, and engineers, including professionals and graduate students. SiERRA-TAG will launch with a pre-workshop webinar to develop community priority targets and culminate with 3-day workshop at University of Nevada, Reno's Tahoe Campus in fall 2026. The purpose of the workshop will be to develop interdisciplinary baseline knowledge and research needs. The products of the workshop will be: A plan for a multi-disciplinary pilot study focusing on an area of critical earthquake risk (baths and co-located dams), a coordination strategy for cross-state border earthquake response in the northern Walker Lane, and an overall "scope of work" sub-project for addressing regional earthquake hazard data gaps. Gathering stakeholders to define these aims will support SiERRA-TAG in future years to advance additional high-risk priority site studies, including establishing magnitude and timing of pre-historic earthquakes on key faults, seismic site characterization at dams and delineation of liquefaction risk zones, developing ground motion models, and updating decades-old earthquake scenarios for high-risk events.

SiERRA-TAG Workshop Goals -

Goal 1

Assess the state of knowledge and critical data gaps.
Review current understanding of active faults, paleoseismic parameters, seismicity, geodesy, deformation, site conditions, ground motions, and infrastructure vulnerability, and identify uncertainties that most strongly affect regional earthquake-hazard estimates.

Goal 2

Identify priority multidisciplinary studies. Determine where coordinated geological, geophysical, geodesy, seismological, and engineering investigations can provide the greatest advances in characterizing seismic sources, ground motions, and earthquake impacts, including candidate sites for an initial multidisciplinary pilot study.

Goal 3

Connect hazard science with infrastructure and engineering needs. Bring together scientists, engineers, utilities, agencies, and local stakeholders to identify credible earthquake scenarios, relevant hazard products, and priority infrastructure systems for subsequent engineering and risk analyses.

Goal 4

Strengthen regional earthquake-response coordination. Develop relationships, communication pathways, response plans, and data collection protocols that can improve coordinated scientific response and cross-border response following future Walker Lane earthquakes.

Goal 5

Develop an actionable research agenda for SiERRA-TAG. Establish shared research priorities and a coordinated work plan that can guide future SiERRA-TAG activities, support improvements to community and national hazard models, and provide a foundation for future collaborative research projects.



workshop QR code

The Walker Lane



Figure 1. Physiographic map of the western U.S. showing San Andreas fault, Sierra Nevada, Walker Lane (shaded orange), and Basin and Range. Tectonic deformation within the Walker Lane is accommodated by normal and strike-slip faults (left- and right-lateral).

Seismic Hazards in the Walker Lane

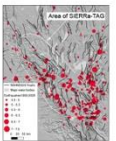


Figure 2. National Seismic Model 2023 fault sources with epicenters of earthquakes 1900-2026, scaled by magnitude.

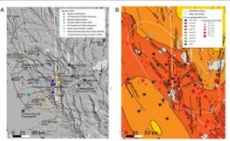


Figure 3. Dams and earthquake hazard in the northern Walker Lane are on-faulted. (A) Major dams by Agency or Utility. (B) USGS M2.5 Fault Sources and major earthquakes of the last 126 years, superimposed on the SiERRA 10% probability of exceeding M6.0 in 50 years (2023-2073). (Petersen et al., 2024; Hahnen et al., 2022) Ellipse is area of study for SiERRA-TAG in both panels.

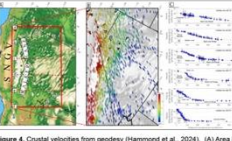


Figure 4. Coastal velocities from geodesy (Hammond et al., 2024). (A) Area in red box shows major covered in panel 3 and locations of velocity profiles at (B) Median spatial filtered velocity field. Vectors colored by magnitude of velocity relative to North America. (C) Velocity components perpendicular to profile locations in (A) showing northward decrease in northeast directed shear.

Join us in better characterizing the northern Walker Lane!

- The workshop will be held at the UNR Lake Tahoe Campus in Incline Village, NV on October 20-22, 2026.
- Workshop applications due by September 4th and participation is limited to 40 people. The workshop will be broadcast remotely to ensure greater participation. Applications and a preliminary agenda can be accessed here: <https://www.scec.org/events/2026-scec-sierra-workshop/>
- Day 1: Background information. Presentations on active faults, paleoseismic constraints, seismicity, geodesy, ground motion models, site characterization, basin effects, seismic source characterization, infrastructure risk, and data needs to improve seismic hazard assessment.
- Day 2: Field trip to the Truckee area. Paleoseismic sites along the Pitavere and Dog Valley faults and reservoir dams that have been seismically retrofitted (Stampeck and Boca dams).
- Day 3: Knowledge gaps to be coordinated research. Working Groups aimed at developing a research work plan, synthesizing recommendations, and defining earthquake scenario needs.



Figure 5. Lidar hillshade of the region of the Day 2 field trip showing the Pitavere and Dog Valley faults and reservoirs operated by the U.S. Bureau of Reclamation. Inset shows fault outcrop at Stampeck Reservoir dam.

Acknowledgements

This workshop is supported by the Statewide California Earthquake Center (Award #20085). SCEC is funded by NSF Cooperative Agreement EAR-2225276 and USGS Cooperative Agreement G24AC00072. We thank all of our federal, state and industry partners that contributed to discussions on planning the workshop including UNR, S. Wernicke, D. Tugman, B. Hammond, C. Kreemer, G. Kent, K. Bognolo, D. Martin, Y. Jiang, M. Zhang, R. Priel, D. Duxson, E. Searles, C. R. Rodriguez, USGS: R. Williams, C. J. Zschau, T. Dawson, G. Sato, K. Conrad, USGS: M. Oake, UCSB: T. Taira, J. Marty, R. Allen, PG&E: C. Malaga, A. Kottke, I. Pienko, O. Kozak, C. Wirth, D. Hesse, C. Carlson, S. Corbett, A. Tate, UCJ: J. Wong, USGS: C. Duffies, A. Hahnen, S. Nissen, C. Gaffney, A. Souper, D. Brittan, J. Kaup. Additionally we thank Ten Huynh and everyone at SCEC meetings, as well as Erin Simonson (UNR Lake Tahoe Campus) for assistance with logistical planning.



