



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

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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 cement new research relationships. The products of the workshop will be: A plan for a multi-disciplinary pilot study focusing on an area of critical earthquake risk (faults and co-located dams), a coordination strategy for cross-state border earthquake response in the northern Walker Lane, and an overall "scope of work" whitepaper 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.

The Walker Lane

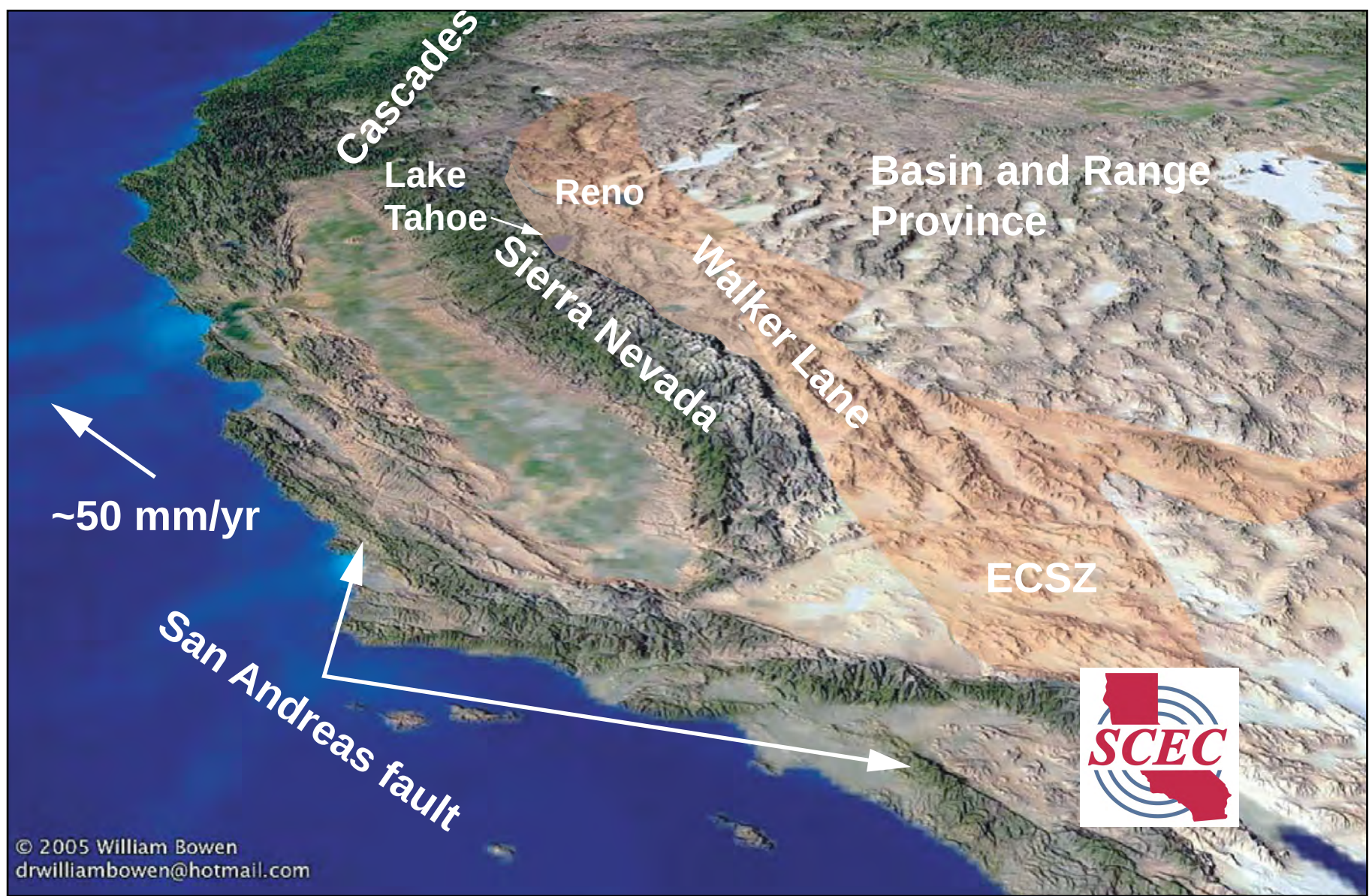


Figure 1. Physiographic map of the western U.S. showing San Andreas fault, Sierra Nevada, Walker Lane (shaded orange), and Basin and Range. Tectonic deformation within the Walker Lane is accommodated by normal and strike-slip faults (left- and right-lateral).

Seismic Hazards in the Walker Lane

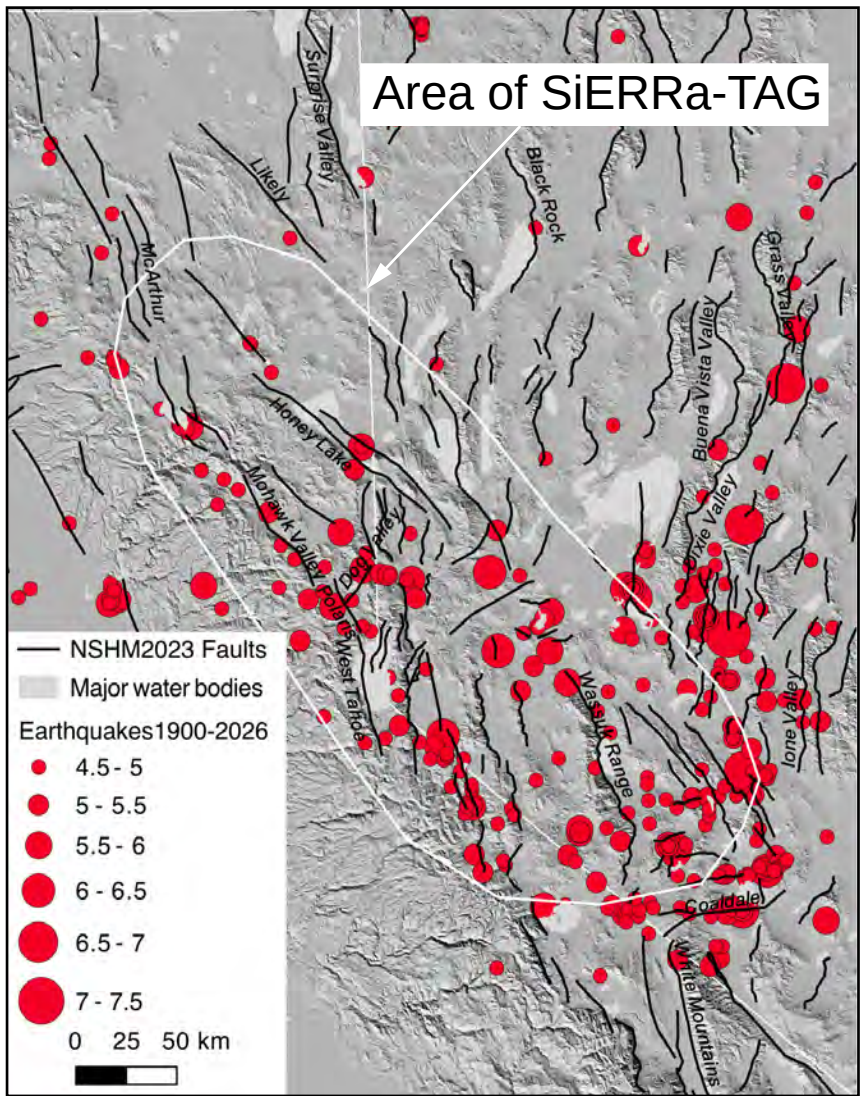


Figure 2. National Seismic Hazard Model 2023 fault sources with epicenters of earthquakes 1900-2026, scaled by magnitude.

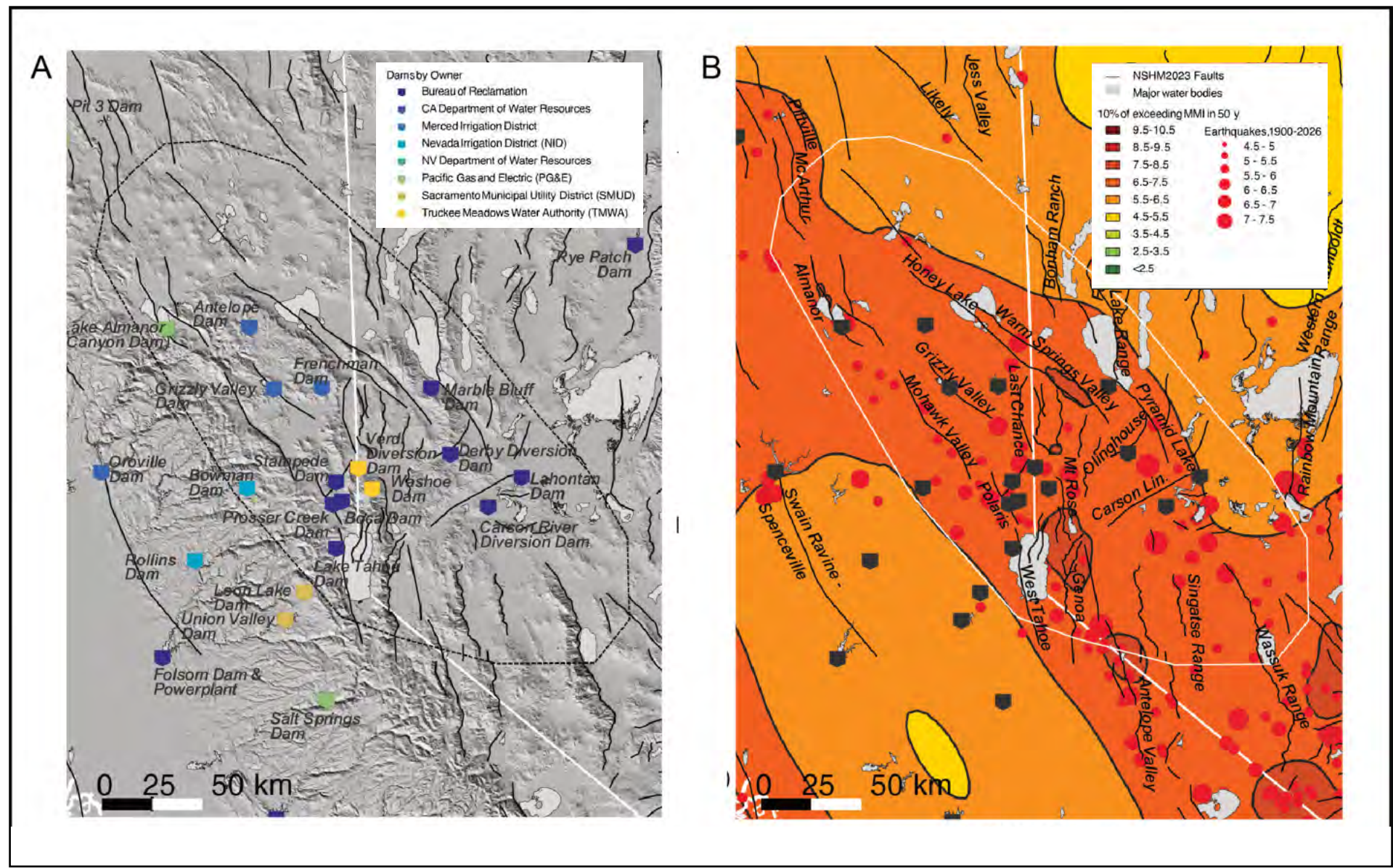


Figure 3. Dams and earthquake hazard in the northern Walker Lane are co-located. (A) Major dams by Agency or Utility. (B) NSHM23 Fault Sources and major earthquakes of the last 126 years, superimposed on the NSHM 10% probability of exceeding MMI in 50 years (2023-2073) (Pertersen et al., 2024; Hatem et al., 2022). Ellipse is area of study for SiERRa-TAG in both panels.

SiERRa-TAG Workshop Goals -

This workshop will bring together earthquake scientists and engineers with utilities, federal, and state agencies, and local stakeholders to address interconnected challenges associated with seismic hazards in the northern Walker Lane. The ultimate goal is to provide a framework for developing multidisciplinary research that can improve earthquake hazard and risk assessment for the region, including scenarios and earthquake response protocols.

Goal 1

Assess the state of knowledge and critical data gaps. Review current understanding of active faults, paleoseismic parameters, seismicity, geodetic 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, geodetic, 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 priorities that can improve coordinated scientific reconnaissance 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 proposals.

workshop QR code



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 Polaris and Dog Valley faults and reservoir dams that have been seismically retrofitted (Stampede and Boca dams).
- Day 3: Knowledge gaps to coordinated research. Working Groups aimed at developing a research work plan, synthesizing recommendations, and defining earthquake scenario needs.

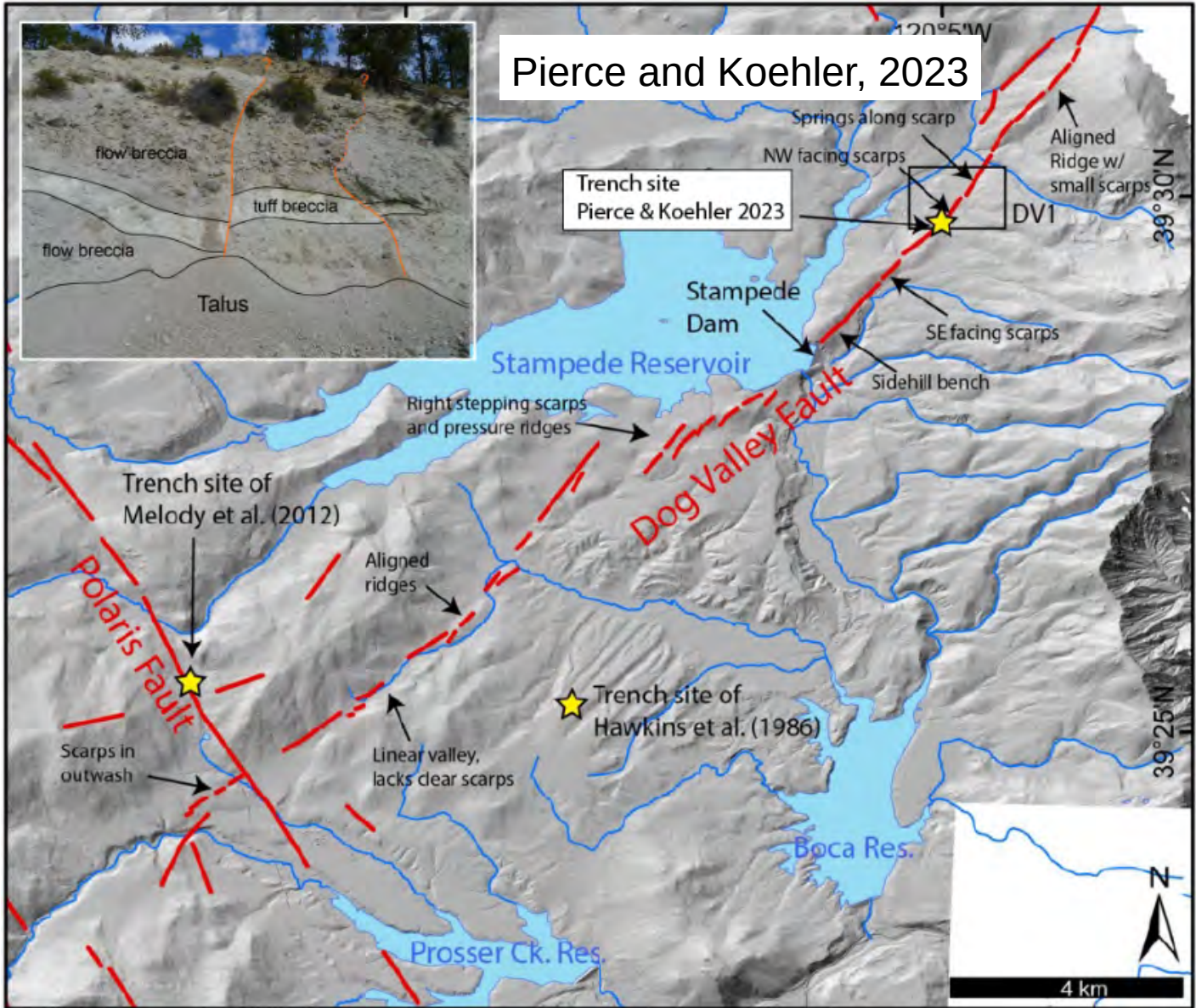


Figure 5. Lidar hillshade of the region of the Day 2 field trip showing the Polaris and Dog Valley faults and reservoirs operated by the U.S. Bureau of Reclamation. Inset shows fault outcrop at Stampede Reservoir dam.



Acknowledgements

This workshop is supported by the Statewide California Earthquake Center (Award #26085). SCEC is funded by NSF Cooperative Agreement EAR-2225216 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. 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. Kaup. Additionally we thank Tran Huynh and everyone at SCEC meetings, as well as Erin Simonton (UNR Lake Tahoe Campus) for assistance with logistical planning.