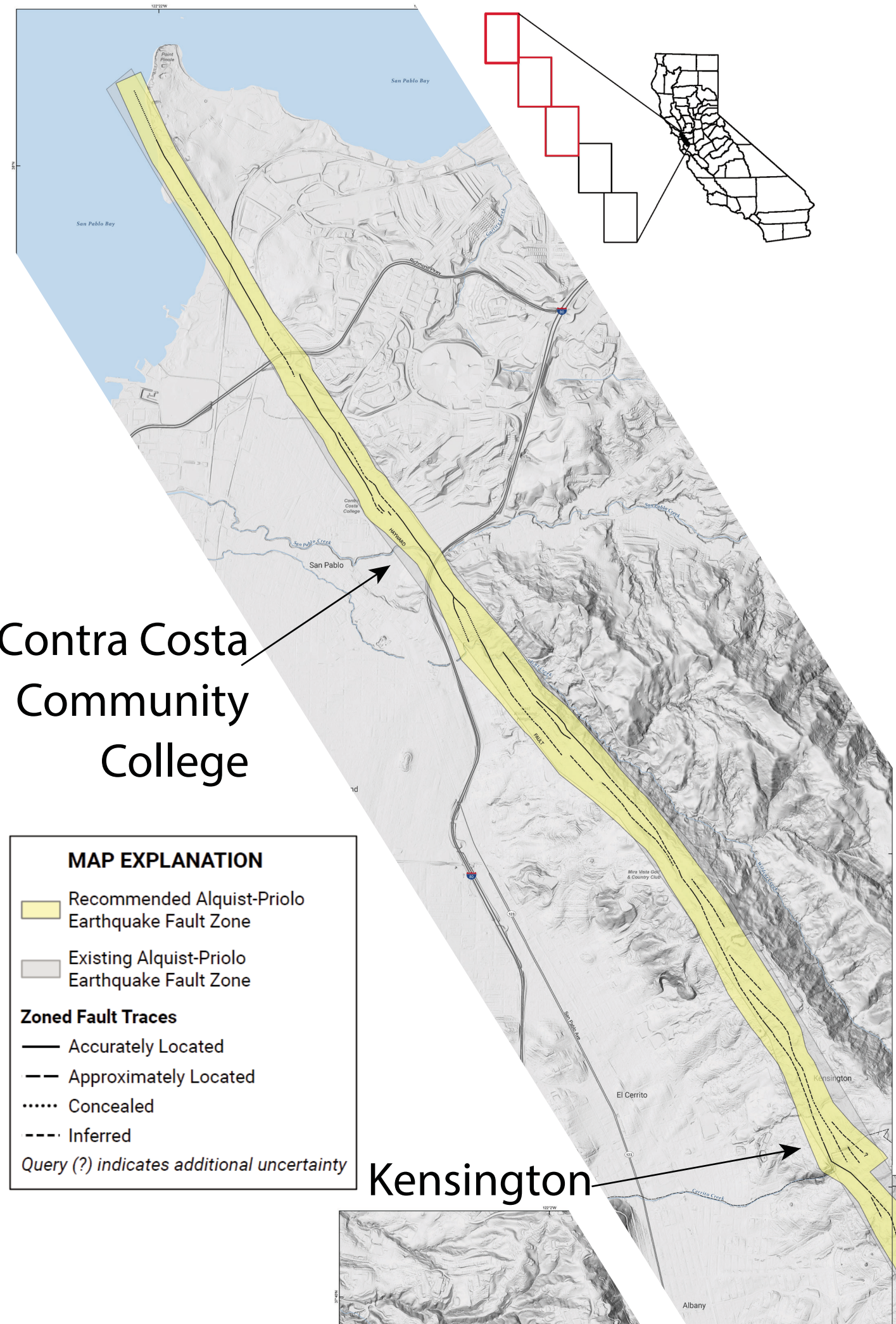


Newly Released Alquist-Priolo Earthquake Fault Zones for the Hayward and Concord Faults in the Eastern San Francisco Bay Area

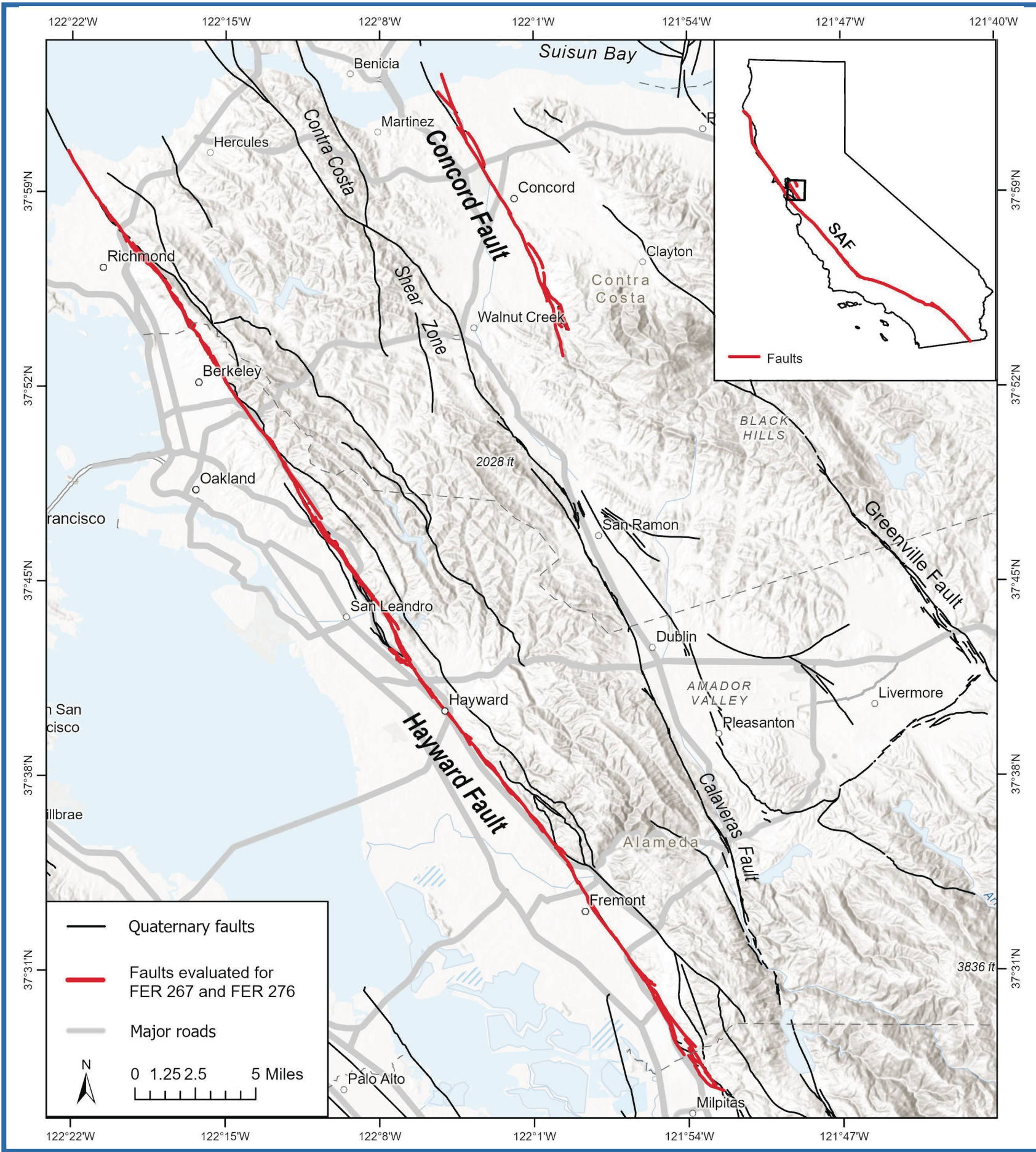
Danielle Madugo, Carla Rosa, and Judith Zachariasen
Fault Zoning Unit, Seismic Hazards Program, California Geological Survey



The Alquist-Priolo (AP) Fault Zoning Act (AP Act) directs the California Geological Survey (CGS) to map Holocene-active faults and define Zones of Required Investigation, or Alquist-Priolo Earthquake Fault Zones (AP Zones) around them. CGS produced dozens of maps after the enactment of the AP Act, creating zones around historical earthquake ruptures and recognized Holocene-active faults. Recent fault ruptures, new data - including lidar-derived topographic data, satellite data, and results from subsurface investigations - and modern mapping tools have further prompted reevaluations of existing AP Zones.

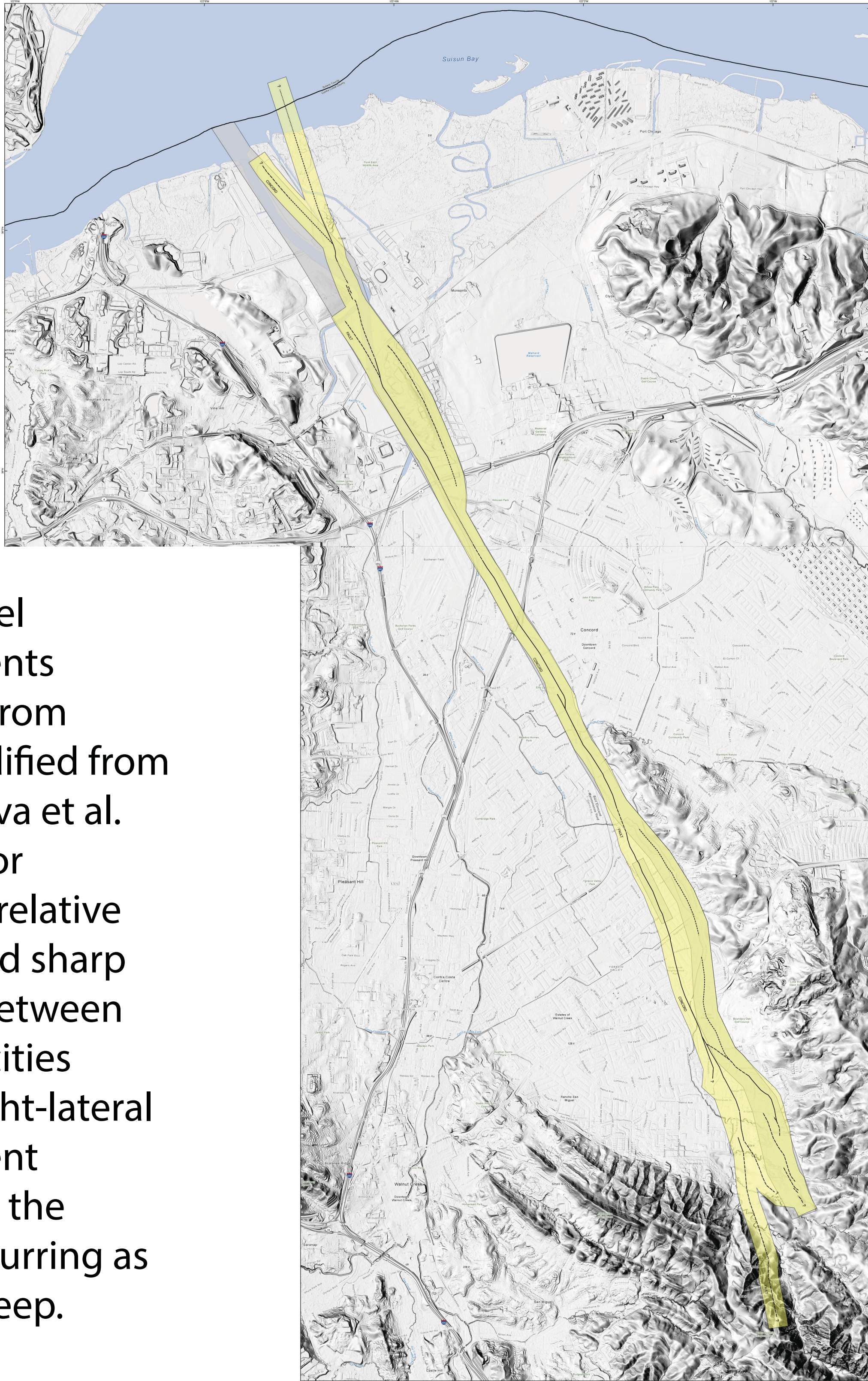
Hayward fault

The recent reevaluation of the Hayward fault (Rosa, 2026), utilized multiple data sources, including high-resolution topographic data (lidar), historical photographs and maps, tectonic creep evidence, and results from over 600 site-specific fault investigations to constrain the location of likely Holocene-active fault traces. As a result, the revised AP Zones are generally narrower and better located than the prior AP Zones, with the exception of areas with evidence to support multiple fault strands and complex areas of faulting.



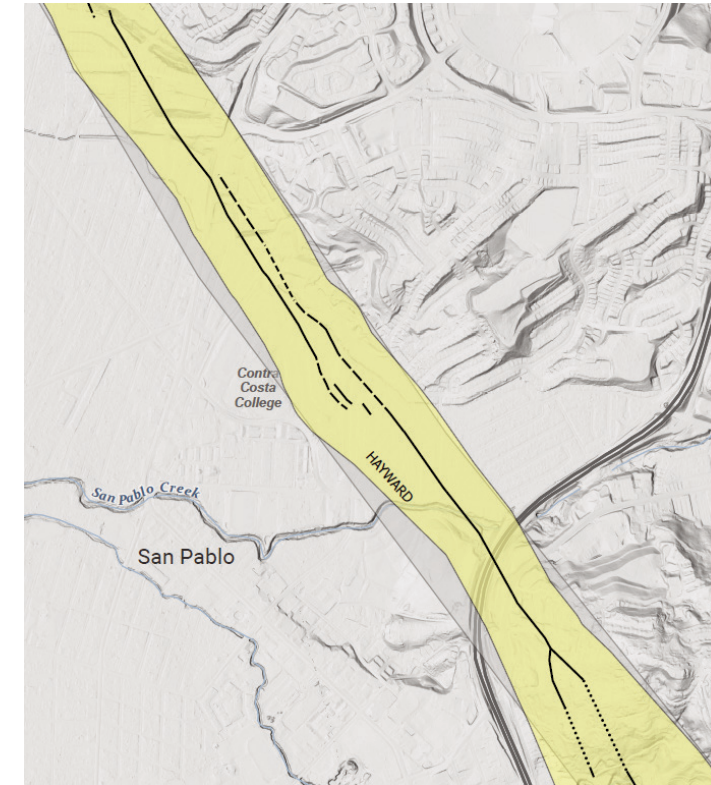
Concord fault

The recent discovery of a previously unrecognized creeping trace of the Concord fault (Elliott et al., 2025) detected in newly released UAVSAR interferograms (Eric Fielding, pers. comm., 2024) spurred a revision of the AP Zone for the Concord fault (Madugo, 2026). This reevaluation utilized lidar, historical aerial photographs, almost 200 site-specific studies, and the interferograms to constrain the location of Holocene-active fault traces. Whereas the previous AP Zone remains relatively unchanged where the fault was previously well located, the AP Zone incorporating the newly recognized creeping trace is wider than the previous zone by as much as 500m. The Holocene fault and AP Zone also extend farther southward, based on our mapping.

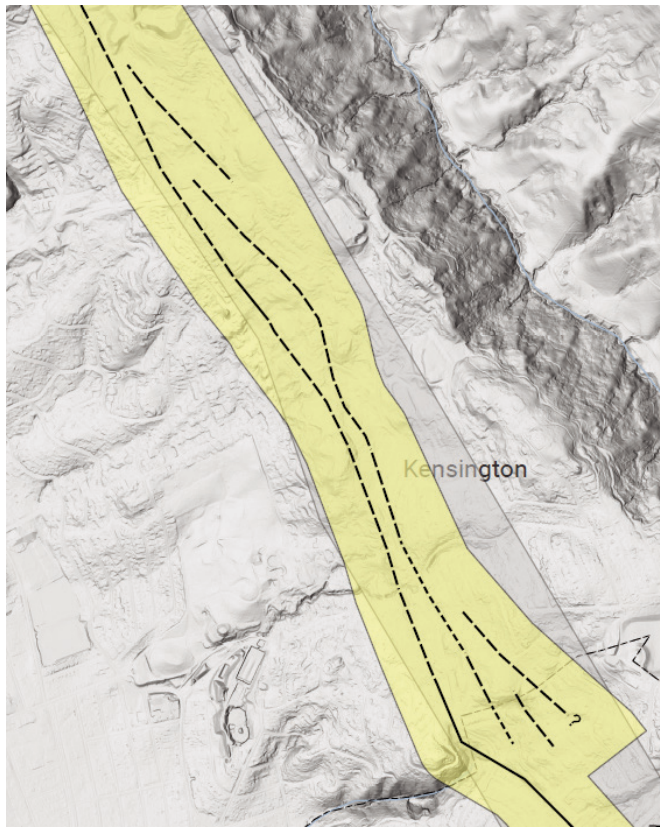


Notable Updates to AP Zones

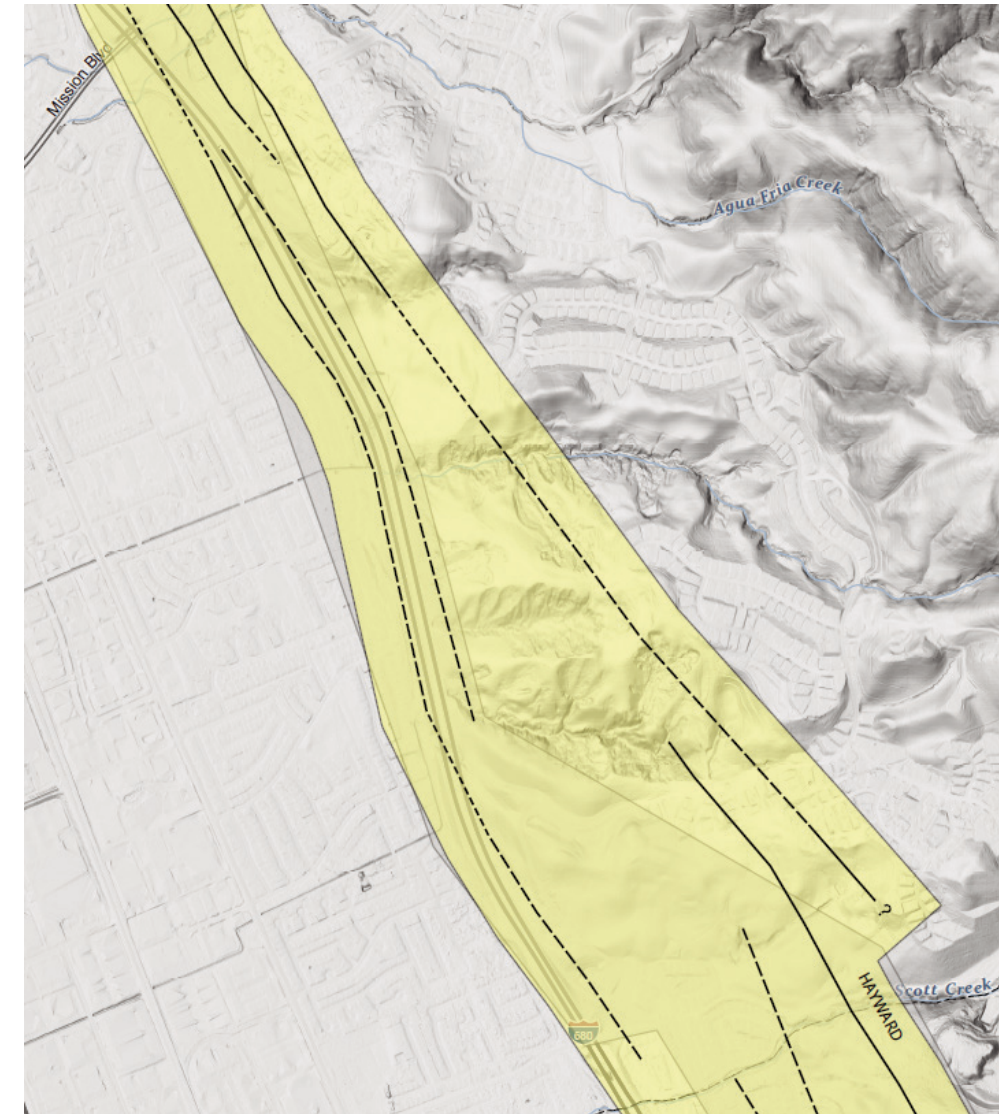
Contra Costa Community College



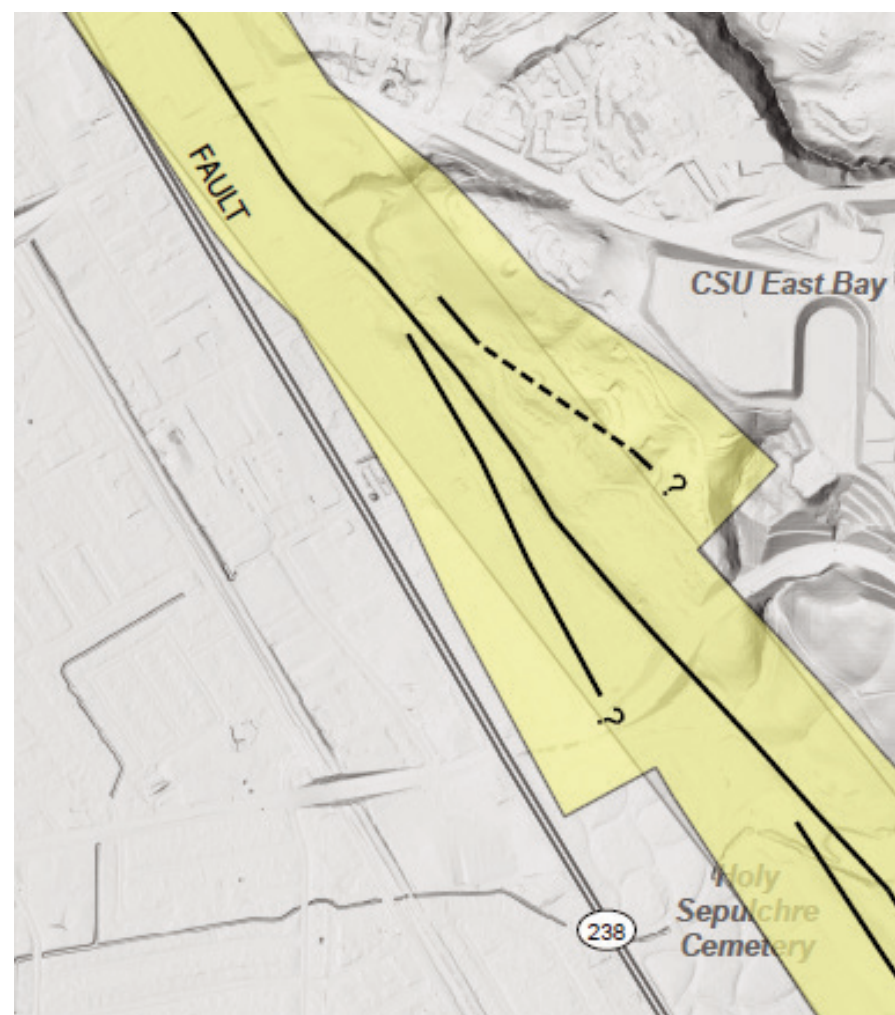
Kensington



Milpitas

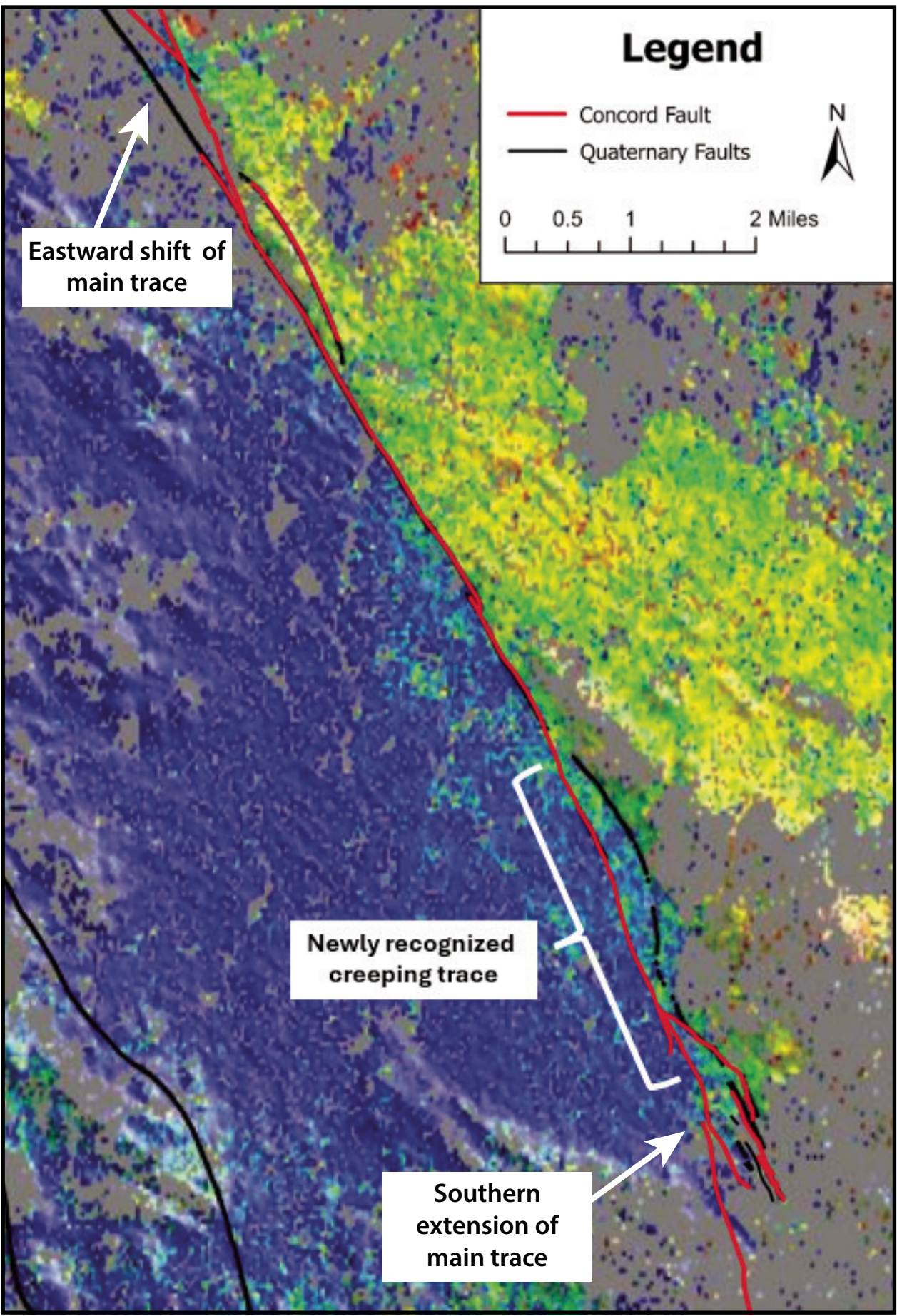


CSU East Bay



Milpitas

CSU East Bay



Fault parallel displacements measured from InSAR; modified from Tymofyeyeva et al. (2019). Color represents relative velocity, and sharp contrasts between those velocities indicate right-lateral displacement localized at the surface occurring as aseismic creep.

References

Elliott, A., Madugo, D., and Vermeer, J., 2025, A Newly Identified Creeping Strand of the Concord Fault, San Francisco Bay Area: Seismological Research Letters 96, p. 3837-3848, <https://doi.org/10.1785/0220240454>

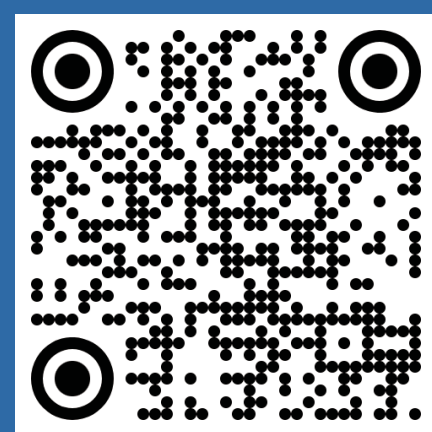
Madugo, 2026, Fault Evaluation Report 276: The Concord Fault in Contra Costa County, California; Preliminary Release dated May 21, 2026, 22 pages, 2 tables, 6 plates.

Rosa, 2026, Fault Evaluation Report 267: The Hayward Fault in Contra Costa, Alameda, and Santa Clara Counties, California; Preliminary Release dated May 21, 2026, 30 pages, 3 tables, 15 plates.

Tymofyeyeva, Ekaterina; Fattahi, Heresh; Bekaert, David; Agram, Piyush, 2019, "High resolution InSAR time series of transient creep on the Concord Fault, Eastern Bay Area", <https://hdl.handle.net/2014/51887>, 2019 SAGE/GAGE Workshop: Earth in 4D: Bridging the Timescales in Dynamic Earth Processes, Portland, Oregon, October 9-11, 2019, JPL Open Repository; CL19-6533.pdf

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Seismic Hazard Geological Investigation Upload Widget

