The Green Valley fault is not where it was mapped because landslides are more important here

Admitting Failure in the Development of a Holocene Earthquake Record for the Green Valley Fault Zone, from a new "Paleoseismic" Site at Siqueira Ranch, Napa County, California

But we do have some new info on the ~11 kA Clear Lake volcanic eruption Eldon Gath



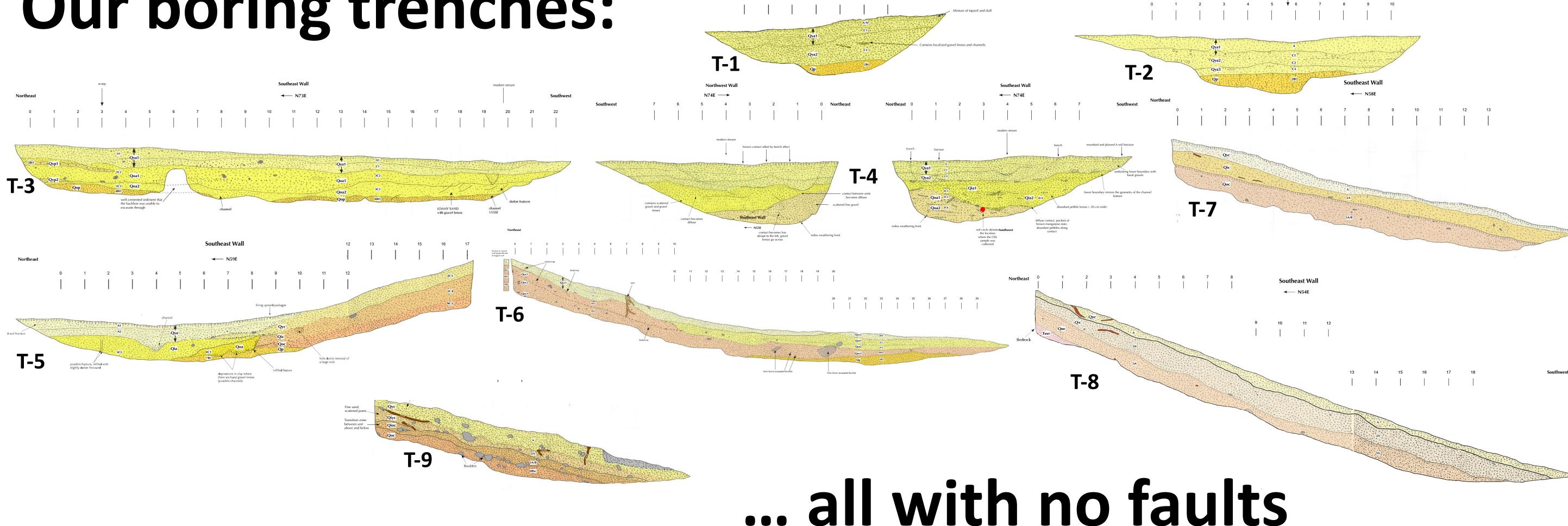
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The Green Valley fault (GVF) is part of the easternmost San Andreas fault system in Northern California. Despite the seismic hazard it poses to local communities and infrastructure, its earthquake history is poorly constrained. This paleoseismic study at the Siqueira Ranch site, which is located within the Howell Mountains approximately 9 km northeast of Napa, was designed to investigate the Holocene earthquake history of the GVF where it has been mapped as forming a step-over "sag pond" within a closed linear canyon (Cole Hollow). Ten trenches were excavated along the valley bottom and on the adjacent hillslopes where the fault was previously mapped. However, no faults or fault-related features were observed in any of the trenches despite their extending across the inferred "fault scarp" that transects the valley. This finding contradicts the Baldwin et al. (2002) conclusion that a Holocene fault trace transects the length of the valley floor. The main GVF trace must be located elsewhere, but mapping is complicated by massive landslides.

However, the development of the closed linear valley is interesting and demonstrates that landslides play a greater geomorphic role than many consider. We infer that the north-flowing stream that initially incised Cole Hollow was blocked by a landslide at its northern end, resulting in ponding of fine-grained sediment, the clay beds exposed in the trenches. However, the southern end of the stream was also diverted to the east by headward expansion of a large landslide, fully isolating Cole Hollow from its original headwaters during the early Holocene. The modern ephemeral stream that transects the valley floor in Cole Hollow is significantly underfit and valley bottom sedimentation is now dictated by fan development from the adjacent hillslopes, principally from the eastern slope. With no through-flowing stream to transport sediment northerly, these fans have expanded across the valley floor, creating localized and transient ponding conditions that mimic tectonic sag ponds. The damming occurred approximately 13.34±1.48 kA ago based on a quartz optically stimulated luminescence age obtained for fluvial deposits 2.0 m below the ground surface in Trench 4. The isolation of the valley preserved volcanic ash within the upper valley sediments that are likely related to the most recent (~11 kA) Clear Lake volcanic field eruptive event (Donnelly-Nolan et al., 1981) sourced approximately 80-100 km north of Cole Hollow.

Our boring trenches:



REFERENCES

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