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# New Constraints on Deformation, Slip Rate, and Timing of the Most Recent Earthquake on the West Tahoe–Dollar Point Fault, Lake Tahoe Basin, California

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High-resolution seismic compressed high intensity Radar pulse (CHIRP) data and piston cores acquired in Fallen Leaf Lake (FLL) and Lake Tahoe provide new paleoseismic constraints on the West Tahoe–Dollar Point fault (WTDPF), the westernmost normal fault in the Lake Tahoe Basin, California. Paleoearthquake records along three sections of the WTDPF are investigated to determine the magnitude and recency of coseismic slip. CHIRP profiles image vertically offset and folded strata along the southern and central sections that record deformation associated with the most recent event (MRE) on the WTDPF. Three faults are imaged beneath FLL, and the maximum vertical offset observed across the primary trace of the WTDPF is ~3.7 m. Coregistered piston cores in FLL recovered sediment and organic material above and below the

MRE horizon. Radiocarbon dating of organic material constrained the age of the MRE to be between 3.6 and 4.9 k.y. B.P., with a preferred age of 4.1–4.5 k.y. B.P. In Lake Tahoe near Rubicon Point, approximately 2.0 m of vertical offset is observed across the WTDPF. Based on nearby core data, the timing of this offset occurred between ~3–10 k.y. B.P., which is consistent with the MRE age in FLL. Offset of Tioga-aged glacial deposits provides a long-term record of vertical deformation on the WTDPF since ~13–14 k.y. B.P., yielding a slip rate of 0.4–0.8 mm/yr. In summary, the slip rate and earthquake potential along the WTDPF is comparable to the nearby Genoa fault, making it the most active and potentially hazardous fault in the Lake Tahoe Basin.

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