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Quaternary Fault and Fold Database of the United States

As of January 12, 2017, the USGS maintains a limited number of metadata fields that characterize the Quaternary faults and folds of the United States. For the most up-to-date information, please refer to the interactive fault map.

West Walker River fault zone (Class A) No. 140

Last Review Date: 1995-10-01

citation for this record: **Sawyer, T.L., compiler, 1995, Fault number 140, West Walker River fault zone, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, https://earthquakes.usgs.gov/hazards/qfaults, accessed 12/14/2020 02:05 PM.**

Synopsis	Distributive zone of generally down-to-the-east normal faults. The faults offset Tioga (13-20 k.y.) glacial moraines and post-Tioga alluvium of probable Holocene age (Clark, 1967 #5634; Bryant, 1983 #5633). Clark and others (1984 #2876) calculated a latest Pleistocene dip-slip rate of 0.6 mm/yr (preferred). Although the fault zone has been mapped in detail (for example, Clark, 1967 #5634; 1972 #5635; 1975 #5636), to date no trenching studies have been conducted.
Name comments	Halsey (1953 #5637) was possibly the first to map this zone of faults that Bryant (1983 #5633) first referred to as the West Walker River fault zone. **Fault ID:** Refers to number 132 (West Walker River fault) of Jennings (1994 #2878).
County(s) and	

County(s) and State(s)	MONO COUNTY, CALIFORNIA
Physiographic province(s)	CASCADE-SIERRA MOUNTAINS
Reliability of location	Good Compiled at 1:62,500 scale. *Comments:* Location based on digital revisions to Jennings (1994 #2878) using original mapping by Clark (1967 #5634; 1972 #5635; 1975 #5636), at 1:62,500.
Geologic setting	High-angle, down-to-east zone of discontinuous (distributed) normal faults that border the eastern front of hills and, to the north, apparently control the course of the West Walker River (Bryant, 1983 #5633).
Length (km)	16 km.
Average strike	N18°E
Sense of movement	Normal *Comments:* Clark (1967 #5634; 1972 #5635).
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	The West Walker River fault zone forms steep (32?-35?) well defined fault scarps of moderate height (5-7 m) on glacial deposits, troughs or linear depressions, a possible subdue scarplet on meadow deposits, and vertically offset drainages (Bryant, 1983 #5633).
Age of faulted surficial deposits	Possibly "young" (Holocene) meadow deposits, latest Pleistocene (Tioga, 13-20 k.y.), and early Pleistocene (Sherwin, >076 Ma) glacial deposits (Clark, 1972 #5635; Bryant, 1983 #5633).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Timing of the most recent paleoevent is poorly constrained. Bryant (1983 #5633) inferred Holocene displacement

	on the basis of offset young (possibly Holocene) deposits in meadow near Sonora Junction.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Clark and others (1984 #2876) report a preferred dip-slip rate of 0.6 mm/yr and a range of 0.3-0.9 mm/yr. This slip rate is based on 7-12 m of dip-slip offset of the crest of a Tioga (13-20 k.y.) moraine near Sonora Junction and the Little Walker River.
Date and Compiler(s)	1995 Thomas L. Sawyer, Piedmont Geosciences, Inc.
References	#5633 Bryant, W.A., 1983, Faults in Antelope Valley, Slinkard Valley, and along the West Walker River, Mono County, California: California Division of Mines and Geology Fault Evaluation Report FER-154, microfiche copy in California Division of Mines and Geology Open-File Report 90-10, 14 p. #5634 Clark, M.M., 1967, Pleistocene glaciation of the drainage of the West Walker River, Sierra Nevada, California: Stanford, California, Stanford University, unpublished Ph.D. dissertation, 130 p. #5635 Clark, M.M., 1972, Deposits and extent of Pleistocene glaciers of the West Walker River drainage, Sierra Nevada, California: Sacramento, California, Unpublished map on file with California Division of Mines and Geology, scale 1:62,500. #5636 Clark, M.M., 1975, Faulted deformation of the drainage of the West Walker River, Sierra Nevada, California, *in* Cenozoic deformation along the Sierra Nevada province and Basin and Range province boundary: California Geology, v. 28, no. 5, p. 103-104, scale 1:62,500. #2876 Clark, M.M., Harms, K.H., Lienkaemper, J.J., Harwood, D.S., Lajoie, K.R., Matti, J.C., Perkins, J.A., Rymer, M.J., Sarna-Wojcicki, A.M., Sharp, R.V., Sims, J.D., Tinsley, J.C., III, and Ziony, J.I., 1984, Preliminary slip rate table and map of late Quaternary faults of California: U.S. Geological Survey Open-File Report 84-106, 12 p., 5 plates, scale 1:1,000,000.

	#5637 Halsey, J.H., 1953, Geology of parts of the Bridgeport, California and Wellington, Nevada quadrangles: Berkeley, University of California, unpublished Ph.D. dissertation, 301 p., scale 1:125,000. #2878 Jennings, C.W., 1994, Fault activity map of California and adjacent areas, with locations of recent volcanic eruptions: California Division of Mines and Geology Geologic Data Map 6, 92 p., 2 pls., scale 1:750,000. #4860 Petersen, M.D., Bryant, W.A., Cramer, C.H., Cao, T., Reichle, M.S., Frankel, A.D., Lienkaemper, J.J., McCrory, P.A., and Schwartz, D.P., 1996, Probabilistic seismic hazard assessment for the State of California: California Department of Conservation, Division of Mines and Geology Open-File Report 96-08 (also U.S. Geological Open-File Report 96-706), 33 p.