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.

unnamed faults in the Pine Mountains (Class A) No. 1289

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citation for this record: **Sawyer, T.L., and Adams, K., compilers, 1999, Fault number 1289, unnamed faults in the Pine Mountains, 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 02:15 PM.**

Synopsis	This distributed group of possibly related faults includes range-front faults bounding the west front of the Pine Nut Mountains from near Sunrise Pass south to south end of Pine Nut Valley and those bounding the east front of Gold Hill near Holbrook Junction, scattered intermontane faults from southeast of McTarnahan Hill south to southeast of Double Springs Flat, and piedmont faults locally on western piedmont slope of the range. The Pine Nut Mountains, at Mount Como, is an west-tilted fault block. Reconnaissance photogeologic mapping and bedrock mapping of the faults are the sources of data. Trench investigations and detailed studies of scarp morphology have not been completed.
Name	Refers to a group of faults in the Pine Nut Mountains mapped by

comments	Moore (1961 #2879), John and others (1981 #2884), Dohrenwend (1981 #2882; 1982 #2481; 1982 #2870), Bell (1981 #2875; 1984 #105; 1984 #107), Stewart and others (1982 #2873), Stewart and Dohrenwend (1984 #2886), and Hayes (1985 #2508); includes Pine Nut Valley fault zone of dePolo (1998 #2845). Faults extend from northern Antelope Valley near Holbrook Junction north through the Pine Nut Mountains to near Sunrise Pass and McTarnahan Hill on the northeast and northwest, respectively. **Fault ID:** Refers to fault numbers WL6A and WL6B (Pine Nut Valley fault zone) of dePolo (1998 #2845).
County(s) and State(s)	CARSON CITY COUNTY, NEVADA LYON COUNTY, NEVADA DOUGLAS COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE CASCADE-SIERRA MOUNTAINS
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault locations south of 39? N. latitude are chiefly based on 1:62,500-scale maps of Dohrenwend (1981 #2884) and Stewart and Dohrenwend (1984 #2886). These locations were compared to 1:250,000-scale map of Dohrenwend (1982 #2870), which was produced by photogeologic analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic quadrangle maps enlarged to scale of the photographs. Fault locations north of 39? N. latitude are chiefly based on 1:250,000-scale map of Bell (1981 #2875; 1984 #105; 1984 #107); mapping is from photogeologic analysis of 1:40,000-scale low sun-angle aerial photography, supplemented with 1:12,000-scale aerial photography of selected areas, several low-altitude aerial reconnaissance flights, and field reconnaissance of major structural and stratigraphic relationships.
Geologic setting	This distributed group of possibly related faults has range-front faults bounding west front of the Pine Nut Mountains from near Sunrise Pass south to south end of Pine Nut Valley and bounding east front of Gold Hill near Holbrook Junction, scattered intermontane faults from southeast of McTarnahan Hill south to southeast of Double Springs Flat, and piedmont faults locally on western piedmont slope of the range (Moore, 1961 #2879; Stewart, 1978 #2866; Bell, 1981 #2875; Dohrenwend, 1981 #2882; John and others, 1981 #2884; Dohrenwend, 1982 #2481;

	Dohrenwend, 1982 #2870; Stewart and others, 1982 #2873; Bell, 1984 #105; Stewart and Dohrenwend, 1984 #2886; Hayes, 1985 #2508); the Pine Nut Mountains at Mount Como is an west-tilted fault block (Stewart and Carlson, 1978 #3413).
Length (km)	42 km.
Average strike	N15°W
Sense of movement	Normal *Comments:* (Moore, 1961 #2879; Dohrenwend, 1982 #2870; Stewart and Dohrenwend, 1984 #2886)
Dip Direction	W; E
Paleoseismology studies	
Geomorphic expression	Although many of faults only offset bedrock, locally faults displace Quaternary alluvium, juxtapose Quaternary deposits against bedrock at front of Pine Nut Mountains, or involve Quaternary-Tertiary erosional surfaces, providing evidence of Quaternary movement (Moore, 1961 #2879; Bell, 1981 #2875; Dohrenwend, 1981 #2882; John and others, 1981 #2884; 1982 #2481; 1982 #2870; Stewart and others, 1982 #2873; 1984 #105; Stewart and Dohrenwend, 1984 #2886; Hayes, 1985 #2508). The range-front faults are expressed as linear front of the Pine Nut Mountains, which exceeds 500 m in topographic relief. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 183 m (158-207 m). Intermontane faults are expressed as a series of aligned saddles, linear drainage valleys, and bedrock escarpments that locally delineate horst and graben (Moore, 1961 #2879; Stewart, 1978 #2866; Bell, 1981 #2875; Dohrenwend, 1981 #2882; John and others, 1981 #2884; Dohrenwend, 1982 #2481; Dohrenwend, 1982 #2870; Stewart and others, 1982 #2873; Bell, 1984 #105; Stewart and Dohrenwend, 1984 #2886; Hayes, 1985 #2508).
Age of faulted surficial deposits	Quaternary; Tertiary. Although Dohrenwend and others (1996 #2846) reported that the faults only displace late Tertiary volcanic rock and/or Quaternary deposits, Dohrenwend (1981 #2882; 1982 #2870), John and others (1981 #2884), and Stewart and Dohrenwend (1984 #2886) mapped some faults that displace late Quaternary alluvium.

Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* The timing of most recent event is not well constrained and the map sources differ greatly. However, Quaternary time is suggested by Dohrenwend (1981 #2882; 1982 #2870), Stewart and Dohrenwend (1984 #2886), and John and others (1981 #2884), which is generally consistent with the "undifferentiated Quaternary" time suggested by the mapping of Bell (1984 #105).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.335 mm/yr based on an empirical relationship between his preferred maximum basal facet height and vertical slip rate. The size of the facets (tens to hundreds of meters, as measured from topographic maps) indicates they are the result of many seismic cycles, and thus the derived slip rate reflects a long-term average. However, the late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) suggest the slip rate during this period is of a lesser magnitude. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	1999 Thomas L. Sawyer, Piedmont Geosciences, Inc. Kenneth Adams, Piedmont Geosciences, Inc.
References	#2875 Bell, J.W., 1981, Quaternary fault map of the Reno 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Open-File Report 81-982, 62 p., http://pubs.er.usgs.gov/publication/ofr81982. #105 Bell, J.W., 1984, Quaternary fault map of Nevada—Reno sheet: Nevada Bureau of Mines and Geology Map 79, 1 sheet, scale 1:250,000. #107 Bell, J.W., 1984, Guidebook for selected Nevada earthquake areas (field trip 18), *in* Lintz, J., Jr., ed., Western geological

excursions: Reno, Nevada, University of Nevada, Mackay School of Mines, 1984 Annual Meetings of the Geological Society of America, Guidebook, v. 4, p. 387-472.

#2845 dePolo, C.M., 1998, A reconnaissance technique for estimating the slip rate of normal-slip faults in the Great Basin, and application to faults in Nevada, U.S.A.: Reno, University of Nevada, unpublished Ph.D. dissertation, 199 p.

#2882 Dohrenwend, J.C., 1981, Reconnaissance surficial geologic map of the Mt. Siegal quadrangle, Nevada-California: U.S. Geological Survey Open-File Report 81-1156, scale 1:62,500.

#2481 Dohrenwend, J.C., 1982, Map showing late Cenozoic faults in the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-D, 1 sheet, scale 1:250,000.

#2870 Dohrenwend, J.C., 1982, Surficial geologic map of the Walker Lake 1° by 2° quadrangle, Nevada-California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-C, 1 sheet, scale 1:250,000.

#2846 Dohrenwend, J.C., Schell, B.A., Menges, C.M., Moring, B.C., and McKittrick, M.A., 1996, Reconnaissance photogeologic map of young (Quaternary and late Tertiary) faults in Nevada, *in* Singer, D.A., ed., Analysis of Nevada's metal-bearing mineral resources: Nevada Bureau of Mines and Geology Open-File Report 96-2, 1 pl., scale 1:1,000,000.

#2508 Hayes, G.F., 1985, Late Quaternary deformation and seismic risk in the southern Sierra Nevada Great Basin boundary zone near the Sweetwater Mountains, California and Nevada: Reno, University of Nevada, unpublished M.S. thesis, 135 p.

#2884 John, D.A., Giusso, J., Moore, W.J., Armin, R.A., and Dohrenwend, J.C., 1981, Reconnaissance geologic map of the Topaz Lake 15 minute quadrangle, California and Nevada: U.S. Geological Survey Open-File Report 81-273, scale 1:62,500.

#2879 Moore, J.G., 1961, Preliminary geologic map of Lyon, Douglas, Ormsby and part of Washoe Counties, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-80, scale 1:200,000.

#2866 Stewart, J.H., 1978, Basin-range structure in western North America—A review, *in* Smith, R.B., and Eaton, G.P., eds., Cenozoic tectonics and regional geophysics of the western cordillera: Geological Society of America Memoir 152, p. 1-31, scale 1:2,500,000.

#3413 Stewart, J.H., and Carlson, J.E., 1978, Geologic map of Nevada: U.S. Geological Survey, Special Geologic Map, 1, scale 1:500,000.

#2886 Stewart, J.H., and Dohrenwend, J.C., 1984, Geologic map of the Wellington quadrangle, Nevada: U.S. Geological Survey Open-File Report 84-211, scale 1:62,500.

#2873 Stewart, J.H., Carlson, J.E., and Johannesen, D.C., 1982, Geologic map of the Walker Lake 1° by 2° quadrangle, California and Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1382-A, scale 1:250,000.