

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](#).

Terraced Hills fault zone (Class A) No. 1606

Last Review Date: 1999-03-02

citation for this record: Sawyer, T.L., and Adams, K., compilers, 1999, Fault number 1606, Terraced Hills 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 02:29 PM.

Synopsis

This apparently short, left-stepping, dextral (right-oblique) slip zone is comprised mainly of intra-plateau faults that extend from the southern Smoke Creek Desert southeast across the Terraced Hills, the floor of northern Pyramid Lake Valley, and The Needle Rocks to the north shore of Pyramid Lake. Aligned hot springs on the floor of the lake suggest that the faults may continue to the south beneath Pyramid Lake, and as such, they may represent the northern continuation of the Pyramid Lake fault zone [1669]. Faults within the Terraced Hills are expressed as northwest-striking linear stream valleys and aligned saddles, and predominately displace Tertiary bedrock, but apparently also displace Holocene deposits. On the valley floor and at The Needle Rocks the faults are expressed as scarps on Pleistocene lake deposits, aligned thermal springs, and very high (>50 m) aligned tufa domes reflecting considerable paleodischarge of groundwater along the Terraced Hills faults. Regional geologic mapping and

	reconnaissance photogeologic mapping are the sources of data. Trench investigations and detailed studies of scarp morphology have not been conducted.
Name comments	Refers to faults mapped by Bonham (1969 #2999), Slemmons (1974, unpublished Lovelock 1? X 2? sheet), and Dohrenwend and others (1991 #285) in the Terraced Hills and The Needle Rocks at the north end of Pyramid Lake. dePolo (1998 #2845) referred to these faults as the Terrace Hills faults. These faults form a zone several kilometers wide, thus the term Terraced Hills fault zone is used herein. Fault ID: Refers to fault LL4 of dePolo (1998 #2845).
County(s) and State(s)	WASHOE COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. <i>Comments:</i> Fault locations are primarily based on 1:250,000-scale reconnaissance photogeologic mapping of Slemmons (1974, unpublished Lovelock 1? X 2? sheet) and Dohrenwend and others (1991 #285) and supplemented by 1:250,000-scale bedrock mapping of Bonham (1969 #2999). Mapping by Dohrenwend and Morning (1991 #281) is based on 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.
Geologic setting	These short left-stepping predominantly intermontane faults extend from southern Smoke Creek Desert across the Terraced Hills, the floor of northern Pyramid Lake Valley and The Needle Rocks to the north shore of Pyramid Lake (Weick, 1990 #3020), therefore, the south end of the zone is poorly defined. Aligned hot springs on the floor of the lake suggest that the faults continue beneath Pyramid Lake, and they may be represent the northern continuation of the Pyramid Lake fault zone [1668].
Length (km)	13 km.
Average strike	N22°W

Sense of movement	Right lateral <i>Comments:</i> Weick (1990 #3020) reported right-oblique slip for faults in the Terraced Hills.
Dip Direction	NE; SW
Paleoseismology studies	
Geomorphic expression	Faults at The Needle Rocks are expressed as scarps and lineaments on Pleistocene lake deposits, aligned thermal springs, and very high (> 50 m) aligned tufa domes. Faults crossing the Terraced Hills are expressed as prominent topographic lineaments formed by aligned stream valleys and saddles.
Age of faulted surficial deposits	Weick (1990 #3020) reported faults in the Terraced Hills clearly offset Holocene deposits, although most only involve Tertiary bedrock. Faults on the floor of Pyramid Lake Valley and at The Needle Rocks apparently are not wave modified and lie below the high shoreline of latest Pleistocene Lake Lahontan, suggesting that they also cut latest Quaternary deposits.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) <i>Comments:</i> Although timing of most recent event is not well constrained, a latest Quaternary time is suggested based on mapping by Weick (1990 #3020) and the presence of scarps and lineaments below the highstand of latest Pleistocene Lake Lahontan.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> A low slip rate is inferred from the generally low slip rates of other normal faults in the area and the modest height of escarpments on Tertiary bedrock. However, geodetic measurements permit moderate rates of dextral shear in the Pyramid Lake region (Thatcher and others, 1999 #3023).
Date and Compiler(s)	1999 Thomas L. Sawyer, Piedmont Geosciences, Inc.

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References

#2999 Bonham, H.F., 1969, Geology and mineral deposits of Washoe and Storey Counties, Nevada: Nevada Bureau of Mines and Geology Bulletin 70, 140 p., 1 pl., scale 1:250,000.

#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.

#281 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Vya 1° by 2° quadrangle, Nevada, Oregon, and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2174, 1 sheet, scale 1:250,000.

#285 Dohrenwend, J.C., McKittrick, M.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Lovelock 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2178, 1 sheet, scale 1:250,000.

#3023 Thatcher, W., Foulger, G.R., Julian, B.R., Svarc, J., Quity, E., and Bawden, G.W., 1999, Present day deformation across the Basin and Range Province, Western United States: Science, v. 283, no. 5408, p. 1714-1718.

#3020 Weick, R.J., 1990, Structural, tectonic and Quaternary study of the eastern Madeline Plains, California and southwestern Smoke Creek Desert, Nevada: Reno, University of Nevada, unpublished M.S. thesis, 160 p.

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