Jump to Navigation

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.

Midas Trough fault zone (Class A) No. 1533

Last Review Date: 1999-01-22

citation for this record: **Adams, K., compiler, 1999, Fault number 1533, Midas Trough 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 02:50 PM.**

Synopsis	This distributed group of northeast-striking faults has range-bounding faults along south side of the Snowstorm Mountains, that extend from south flank of Jake Creek Mountain west-southwest to west of Jake Creek, faults bounding north front of volcanic mesas at the west end of Squaw Valley, and intrabasin fault between these upland areas that are generally subparallel to Evans Creek; these faults bound the western Midas Trough, a large-scale graben or tectonic trough and may be related to faults in fault zone 1532 to the southeast. Faults bounding the upland areas are locally expressed as southeast- and northwest-facing scarps on Pleistocene alluvium and as steep escarpments up to several hundred meters high. Although many of the faults have a large normal component evidenced by high topographic escarpments, some may have a sinistral component as well. Reconnaissance photogeologic and bedrock mapping of the faults are the sources of data. Trench investigations and detailed studies

	of scarp morphology have not been completed.
Name comments	Refers to faults mapped by Slemmons (1966, unpublished McDermitt 1? X 2? sheet), Stewart and Carlson (1976 #3013), Coats (1987 #2861), Dohrenwend and Moring (1991 #284), and Wallace (1990 #3015) in and along southeast side of the Snowstorm Mountains and along north side of volcanic mesas at west end of Squaw Valley. dePolo (1998 #2845) referred to the fault bounding south side of the Snowstorm Mountains as the Midas fault and the fault bounding the mesas as the Midas Tough [sic] faults; the Midas Trough name is descriptive and herein refers to the entire fault zone. **Fault ID:** Refers to faults MD10 (Midas fault) and MD11 (Midas Tough [sic] faults) of dePolo (1998 #2845).
County(s) and State(s)	HUMBOLDT COUNTY, NEVADA ELKO COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault locations are primarily based on 1:250,000-scale map of Dohrenwend and Moring (1991 #284) which was produced by 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. Additional faults were compiled from 1:250,000-scale map of Slemmons (1966, unpublished McDermitt 1? X 2? sheet) and 1:24,000-scale bedrock mapping of Wallace (1990 #3015). Slemmons (1966, unpublished McDermitt 1? X 2? sheet) mapped from analysis of 1:60,000-scale AMS photography transferred to mylar overlaid onto a 1:250,000-scale topographic map using proportional dividers. Fault locations were checked against 1:250,000-scale bedrock mapping of Coats (1987 #2861).
Geologic setting	This distributed group of northeast-striking faults has range-bounding faults along south side of the Snowstorm Mountains, that extend from south flank of Jake Creek Mountain west-southwest to west of Jake Creek, faults bounding north front of volcanic mesas at the west end of Squaw Valley, and intrabasin fault between these upland areas that are generally subparallel to

	Evans Creek (Slemmons, 1966, unpublished McDermitt 1? X 2? sheet; Dohrenwend and Moring, 1991 #284); these faults bound the western Midas Trough, a large-scale graben or tectonic trough and may be related to faults in fault zone 1532.
Length (km)	37 km.
Average strike	N56°E
Sense of movement	Normal *Comments:* Although many of the faults have a large normal component evidenced by high topographic escarpments (Slemmons, 1966, unpublished McDermitt 1? X 2? sheet; Dohrenwend and Moring, 1991 #284), Wallace (1990 #3015) mapped many faults as having a possible sinistral component, including a branch of the Midas fault that indicates about 350 m of left lateral offset of an apparently vertical 14.3 Ma feeder dike.
Dip Direction	NW; SE
Paleoseismology studies	
Geomorphic expression	Faults bounding the upland areas are locally expressed as southeast- and northwest-facing scarps on early to late Pleistocene alluvium and as steep escarpments up to several hundred meters high. The preferred maximum basal fault facet on south side of the Snowstorm Mountains is reported as 61 m (49-122 m) by dePolo (1998 #2845).
Age of faulted surficial deposits	latest Quaternary(?); early to middle Quaternary; Quaternary; Tertiary. Dohrenwend and Moring (1991 #284) mapped faults that displace latest Quaternary(?), early to middle Quaternary and undifferentiated Quaternary alluvium, and juxtapose undifferentiated Quaternary alluvium against bedrock.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* The timing of most recent event is not well constrained. The majority of scarps have very poorly constrained ages. The youngest scarps shown by Dohrenwend and Moring (1991 #284) may be latest Quaternary, but their lack of lateral continuity suggests that the most recent event may be

	considerably older. Due to the poorly constrained age information, the most conservative age category is assigned here.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* A low vertical slip rate is suggested by the general topographic expression of the basin and range topography. In addition a low lateral slip rate is suggested by the 350 m offset of a vertical 14.3 Ma dike across a branch of the Midas fault, although the timing of movement is not well constrained (Wallace, 1990 #3015). dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.158 mm/yr for the northwestern range-bounding fault and 0.01 mm/yr to the central trace 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. The late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) support a low slip rate. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	1999 Kenneth Adams, Piedmont Geosciences, Inc.
References	#2861 Coats, R.R., 1987, Geology of Elko County, Nevada: Nevada Bureau of Mines and Geology Bulletin 101, 112 p., 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. #284 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the McDermitt 1° by 2° quadrangle, Nevada, Oregon, and Idaho: U.S. Geological Survey Miscellaneous Field Studies Map MF-2177, 1 sheet, scale 1:250,000. #3013 Stewart, J.H., and Carlson, J.E., 1976, Geologic map of

	north-central Nevada: Nevada Bureau of Mines and Geology, Map 50, scale 1:250,000. #3015 Wallace, A.R., 1990, Geologic map of the Jake Creek Mountain quadrangle, Elko County, Nevada: U.S. Geological Survey Geologic quadrangle Map GQ-1672, scale 1:24,000.