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.

Gerlach fault zone (Class A) No. 1612

Last Review Date: 1999-03-06

citation for this record: Sawyer, T.L., and Adams, K., compilers, 1999, Fault number 1612, Gerlach 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 short, nearly continuous zone is comprised of range-front faults that bound the southeast front of the Granite Range. These faults extend from near Granite Point northwest of Gerlach, northeast along the western side of the Black Rock Desert to the south end of Hualapai Flat. The southern part of the fault has recognized scarps on alluvium as young as latest Quaternary. Reconnaissance photogeologic mapping and regional geologic 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Name comments	Refers to faults mapped by Bonham (1969 #2999), Slemmons (1974, unpublished Lovelock 1?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), Johnson (1977 #2569), and Dohrenwend and others (1991 #285) along the southeast side of the Granite Range from near Granite Point northwest of Gerlach, northeastward to south end of Hualapa Flat. dePolo (1998 #2845) referred to these faults as the Gerlach fault

	zone, the name that is accepted herein. **Fault ID:** Refers to fault LL10 of dePolo (1998 #2845).
County(s) and State(s)	PERSHING COUNTY, NEVADA WASHOE 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 others (1991 #285), which 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. Fault locations were checked against 1:250,000-scale photogeologic map of Slemmons (1974, unpublished Lovelock 1? X 2? sheet) and 1:250,000-scale bedrock maps of Bonham (1969 #2999) and Johnson (1977 #2569).
Geologic setting	This short, nearly continuous zone is comprised of range-front faults that bound the southeast front of the Granite Range. These faults extend from near Granite Point northwest of Gerlach, northeast along the western side of the Black Rock Desert to the south end of Hualapai Flat (Bonham, 1969 #2999; Johnson, 1977 #2569; Dohrenwend and others, 1991 #285; and Slemmons, 1974, unpublished Lovelock 1? X 2? sheet).
Length (km)	16 km.
Average strike	N37°E
Sense of movement	Normal *Comments:* As shown by Dohrenwend and others (1991 #285) and inferred from topography.
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	Piedmont faults are expressed as east-facing scarps on latest Quaternary alluvial and lacustrine deposits and range-front faults

	are expressed as the abrupt front of the Granite Range along which Quaternary deposits are juxtaposed against bedrock (Dohrenwend and others, 1991 #285). dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 244 m (213-256 m).
Age of faulted surficial deposits	Dohrenwend and others (1991 #285) mapped faults that displace late Quaternary and undifferentiated Quaternary piedmont-slope deposits that be as young as Holocene south of Bowen Canyon.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Although timing of most recent event is not well constrained, a latest Quaternary time is suspected based on reconnaissance photogeologic mapping of Dohrenwend and others (1991 #285), which is permissive with the reconnaissance photogeologic mapping of Slemmons (1974, unpublished Lovelock 1? X 2? sheet) that supports a late Quaternary.
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.488 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. Even though, the late Quaternary characteristics of this fault (overall geomorphic expression, continuity of scarps, age of faulted deposits, etc.) indicate young movement, there exists no data to indicate recurrent movent in the latest Quaternary. Nevertheless, the 0.2-1.0 mm/yr slip-rate category has been assigned to this fault, pending determination of direct geologic slip rates.
Date and Compiler(s)	1999 Thomas L. Sawyer, Piedmont Geosciences, Inc. Kenneth Adams, Piedmont Geosciences, Inc.

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. #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. #2569 Johnson, M.G., 1977, Geology and mineral deposits of Pershing County, Nevada: Nevada Bureau of Mines and Geology Bulletin 89, 115 p., scale 1:250,000.