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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.

Northern Roberts Mountains fault (Class A) No. 1181

Last Review Date: 2000-09-11

citation for this record: **Lidke, D.J., compiler, 2000, Fault number 1181, Northern Roberts Mountains fault, 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 02:17 PM.**

Synopsis	This major range-front fault trends northeast along the entire northern flank of the Roberts Mountains. It places Paleozoic rocks of the Roberts Mountains against Quaternary piedmont-slope deposits along the adjacent eastern side of the Denay Valley and is locally marked by northwest-facing scarps. There is evidence along the fault zone for at least one faulting event that is no older than early Pleistocene, and perhaps is as young as late Pleistocene in age. The fault has not been studied in detail and little is actually known with certainty about its nature, character, and movement history. The principle sources of data consist of geologic mapping, reconnaissance photogeologic mapping, and a reconnaissance geomorphic study of fault scarps and basal fault facets.

Name comments	Refers to faults mapped by Lehner and others (1961 #4363), Murphy and others (1978 #4368), McKee, (1986 #4367), and Dohrenwend and others (1992 #283) along the northern range-front of the Roberts Mountains. dePolo (1998 #2845) referred to this fault as the Northern Roberts Mountains fault and that name is used herein. Fault extends along the northern flank of the Roberts Mountains, southwest from northeast of Rabbit Spring to east of Tonkin Summit. **Fault ID:** Refers to fault that dePolo (1998 #2845) portrayed and labeled as MI19.
County(s) and State(s)	EUREKA COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Location is from 1:250,000-scale map of Dohrenwend and others (1992 #283), which shows mapping based on photogeologic analysis of 1:58,000-nominal-scale, color-infrared photography transferred directly to 1:100,000-scale topographic maps enlarged to the scale of the photographs; these maps were then reduced and compiled at 1:250,000-scale.
Geologic setting	This continuous, down-to-the-northwest, range-front fault places Paleozoic bedrock of the Roberts Mountains against Quaternary deposits along the northern flank of the Roberts Mountains; locally the fault is marked by northwest-facing scarps (Lehner and others, 1961 #4363; Murphy and others, 1978 #4368; McKee, 1986 #4367; Dohrenwend and others, 1992 #283). The apparent down-to-the-northwest offset shown by the range-front fault and northwest-facing associated scarps consistently indicate principally down-to-the-northwest offset along the fault, which probably reflects continued Quaternary uplift of the Roberts Mountains relative to the adjacent Denay Valley. There is obvious Quaternary movement along the fault; however, it has not been studied in detail and estimates of offset along the fault have not been reported. Dohrenwend and others (1992 #283) classified the fault as a major range-front fault.
Length (km)	22 km.

Average strike	N46°E
Sense of movement	Normal *Comments:* Not specifically reported, however, the down-to-northwest range-front fault and associated northwest-facing scarps consistently indicate down-to-the-northwest offset, which in this extensional regime probably reflects principally normal, dip-slip movement along northwesterly dipping faults.
Dip Direction	NW *Comments:* Not reported, but probably steep, based on dip measurements of other Quaternary faults in localities nearby and elsewhere in the Basin and Range Province.
Paleoseismology studies	
Geomorphic expression	Fault is expressed principally as a single, continuous, northeast-striking, range-front fault along the northern flank of the Roberts Mountains (Dohrenwend and others, 1992 #283). The northeastern end of the fault is marked by northwest-facing scarps on fan deposits (Dohrenwend and others, 1992 #283) and the southeastern end is marked by a few north-trending scarps that appear to splay southward from the range-front fault (Murphy and others, 1978 #4368; McKee, 1986 #4367). dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 171 m (146-195 m).
Age of faulted surficial deposits	Murphy and others (1978 #4368) and McKee (1986 #4367) both mapped faulted fan deposits along the fault and they assigned an undifferentiated Holocene or Pleistocene age to these faulted deposits. Dohrenwend and others (1992 #283) assigned a broad Pleistocene age to some of the faulted deposits, but assigned a questionable late Pleistocene age to some of the faulted deposits.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* The timing of the most recent prehistoric faulting event is not well constrained. Mapping studies by Murphy and others (1978 #4368), McKee (1986 #4367), and Dohrenwend and others (1992 #283) similarly indicate that one or more Quaternary

	faulting events has occurred along this fault. Mapped relations shown by Murphy and others (1978 #4368) and McKee (1986 #4367) suggest that the most recent faulting event probably is no older than middle Quaternary (<750 ka) in age, based on deformation of relatively young fan deposits, which are significantly younger than the oldest Pleistocene fan deposits they mapped. The most recent event might even be as young as late Quaternary (<130 ka) in age, based on the questionable late Pleistocene ages that Dohrenwend and others (1992 #283) assigned with indicated uncertainty to some of the faulted deposits.
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 0.312 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)	2000 David J. Lidke, U.S. Geological Survey
References	#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. #283 Dohrenwend, J.C., Schell, B.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Millett 1° by 2° quadrangle, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-2176, 1 sheet, scale 1:250,000. #4363 Lehner, R.E., Tagg, K.M., Bell, M.M., and Roberts, R.J.,

	1961, Preliminary geologic map of Eureka County, Nevada: U.S. Geological Survey Mineral Investigations Field Studies Map MF-178, 1 sheet, scale 1:250,000. #4367 McKee, E.H., 1986, Geologic map of the Roberts Wilderness Study Area, Eureka County, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-1844, 1 sheet, scale 1:48,000. #4368 Murphy, M.A., McKee, E.H., Winterer, E.L., Matti, J.C., and Dunham, J.B., 1978, Preliminary geologic map of the Roberts Creek Mountain quadrangle, Nevada: U.S. Geological Survey Open-File Report 78-376, 1 sheet, scale 1:31,250.