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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.

Western Roberts Mountains fault (Class A) No. 1183

Last Review Date: 2000-09-12

citation for this record: **Lidke, D.J., compiler, 2000, Fault number 1183, Western 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 northwest-striking fault is comprised of a northern, major range-front fault along the southwestern flank of the Roberts Mountains and a southern, relatively long scarp on piedmont-slope deposits of the Kobeh Valley. There is evidence for at least one faulting event that is no older than early Pleistocene in age, but the youngest faulting event is probably Holocene in age. The fault has not been studied in detail; however, little is actually known with certainty about its nature, character, and movement history. The principle sources of data consist of geologic mapping, photogeologic mapping supplemented by some field verification, reconnaissance photogeologic mapping, and reconnaissance geomorphic study of fault scarps and basal fault facets.

Name comments	Refers to fault mapped by Murphy and others (1978 #4368), Schell (1981 #2844), and Dohrenwend and others (1992 #283) that is present along, and southeast of, the southwestern flank of the Roberts Mountains. Schell (1981 #2844) referred to this fault as the Kobeh fault, and dePolo (1998 #2845) later referred to this fault as the Western Roberts Mountains fault. The fault extends along the southwestern flank of the Roberts Mountains, southeastward from directly west of Tonkin Summit to about Rutabaga Creek, and there continues to extend southeastward to about Roberts Creek in the Kobeh Valley. **Fault ID:** Refers to fault that was mapped and labeled 56 by Schell (1981 #2844) and later portrayed and labeled MI20 by dePolo (1998 #2845).
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 based on 1:250,000-scale maps of Schell (1981 #2844) and Dohrenwend and others (1992 #283). Mapping by Schell (1981 #2843; 1981 #2844) included field verification, but was based primarily on photogeologic analysis of 1:24,000-scale, color, aerial photography that was supplemented by analysis of some 1:60,000-scale, black-and-white, aerial photography: faults identified on the aerial photographs were transferred by inspection to 1:62,500-scale topographic maps that were photographically reduced to 1:250,000-scale for final compilation of the faults on 1:250,000-scale topographic maps. Mapping by Dohrenwend and others (1992 #283) was 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 northwest-striking fault follows the southwestern flank of the Roberts Mountains as a major range-front fault that appears to extend farther southeast as a prominent scarp on piedmont-slope deposits of the northern part of the Kobeh Valley (Murphy and others, 1978 #4368; Schell, 1981 #2844; Dohrenwend and others,

	1992 #283). Locally, southwest-facing scarps are present along the range-front part of the fault (Murphy and others, 1978 #4368). Northwest-striking Quaternary faults are not common in the Millett 1?x2? quadrangle. However, the northwest-striking, Western Roberts Mountains fault (and fault 1184) appears to coincide with the southeastern end of the Northern Nevada Rift, which is marked by a northwest-striking lineament that may represent an ancient rift system (Zoback and Thompson, 1978 #3059; Schell, 1981 #2843). Along the southwestern flank of the Roberts Mountains, the fault has down-to-the-southwest stratigraphic offset that juxtaposes Paleozoic bedrock against Quaternary piedmont-slope deposits (older Quaternary fan deposits of Murphy and others, 1978 #4368). Where the scarp crosses into the northern part of the Kobeh Valley, it is marked by a continuous, southwest-facing scarp on piedmont-slope deposits that Schell (1981 #2844) reported as Holocene. Stratigraphic relations across the range-front part of the fault as well as the southwest-facing direction of the scarps, imply mostly down-to-the-southwest offset along the fault that probably reflects some continued Quaternary uplift of the Roberts Mountains relative to the adjacent Kobeh Valley.
Length (km)	24 km.
Average strike	N30°W
Sense of movement	Normal *Comments:* Not specifically reported, however, the down-to-southwest range-front fault and the southwest-facing scarps consistently indicate down-to-the-southwest offsets, which in this extensional regime probably reflects principally normal, dip-slip movement along southwesterly dipping faults.
Dip Direction	SW *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	The northern part of the fault is expressed by a single, relatively continuous, northwest-striking, major range-front fault along the

	southwestern flank of the Roberts Mountains. The fault juxtaposes bedrock of the mountain range against piedmont-slope deposits and is marked by southwest-facing scarps (Murphy and others, 1978 #4368; Schell, 1981 #2844; Dohrenwend and others, 1992 #283). The southern part of the fault is expressed by a single, relatively continuous, southwest-facing scarp that is present on piedmont-slope deposits of the northern part of the Kobeh Valley. Schell (1981 #2844) reported a maximum scarp height of about 1 m along this scarp. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 98 m (85-122 m).
Age of faulted surficial deposits	Murphy and others (1978 #4368) mapped faulted, older, Quaternary fan deposits along the range-front part of the fault, but they did not constrain the age of these deposits any more tightly than as broadly Quaternary. Dohrenwend and others (1992 #283) also did not assign specific ages to faulted deposits along these faults, and their map indicates only that Quaternary deposits are juxtaposed against older bedrock and that scarps are present on Quaternary piedmont-slope deposits along this fault. Schell (1981 #2844) apparently was more confident of the age of the youngest faulted deposits, which he considered to be Holocene.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Mapping studies by Murphy and others (1978 #4368) and Dohrenwend and others (1992 #283) similarly indicate that one or more Quaternary faulting events has occurred along this fault. Schell (1981 #2844) reported a probable latest Quaternary (<15 ka) time for the most recent event, based on the Holocene age he assigned to some of the faulted deposits along the fault. The fault has not been studied in detail and estimates of Quaternary offset and slip rate along the fault have not been reported
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 0.199 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. 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 low. 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. #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. #2843 Schell, B.A., 1981, Faults and lineaments in the MX Sitting Region, Nevada and Utah, Volume I: Technical report to U.S. Department of [Defense] the Air Force, Norton Air Force Base, California, under Contract FO4704-80-C-0006, November 6, 1981, 77 p. #2844 Schell, B.A., 1981, Faults and lineaments in the MX Siting Region, Nevada and Utah, Volume II: Technical report to U.S. Department of [Defense] the Air Force, Norton Air Force Base, California, under Contract FO4704-80-C-0006, November 6, 1981, 29 p., 11 pls., scale 1:250,000. #3059 Zoback, M.L., and Thompson, G.A., 1978, Basin and Range rifting in northern Nevada—Clues from a mid-Miocene rift and its subsequent offsets: Geology, v. 6, no. 2, p. 111-116.