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.

Buffalo Mountain fault (Class A) No. 1139

Last Review Date: 2000-07-18

citation for this record: **Anderson, R.E., compiler, 2000, Fault number 1139, Buffalo Mountain 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 02:18 PM.**

Synopsis	The Buffalo Mountain fault is a northeast-striking range-front structure at the southeast base of Buffalo Mountain. Toward its northern end, it bifurcates and one strand of the fault bends sharply to the northwest. Compared with other major range-front faults in the region, it probably has a small to moderate total displacement based on scattered exposures of upper Paleozoic bedrock on the downthrown block, stratigraphically equivalent to strata in the upthrown block. The fault places Quaternary deposits against bedrock, but is marked mainly by a lineament along which no young fault scarps are preserved. However, reconnaissance photogeologic mapping, shows short parts of the fault are formed on surficial deposits or erosion surfaces of Pleistocene age. The generally irregular geomorphic expression of the range front suggests an estimated age of scarp formation of much greater than 12 ka. No detailed studies have been made and no recurrence times are reported.

Name comments	Name modified from Wallace (1979 #203) who referred to the fault as the Buffalo Mountain scarp and dePolo (1998 #2845) who referred to it as the Buffalo Mountain fault zone. The fault extends from the northeast corner of Buffalo Mountain southwest to within about 1 km of the Humboldt/Pershing County line. **Fault ID:** Referred to as fault WI5 by dePolo (1998 #2845).
County(s) and State(s)	HUMBOLDT COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Fault traces taken from the 1:125,000-scale map of young fault scarps by Wallace (1979 #203). That map was compiled mostly from a combination of photogeologic and field mapping on 1:60,000-scale aerial photographs.
Geologic setting	The Buffalo Mountain fault is a northeast-striking range-front structure at the southeast base of Buffalo Mountain. According to Wallace (1979 #203), the fault is discontinuous and splits near its northeast end with one splay bending sharply north and the other continuing northeast. The northeast extension is not shown on the 1:24,000-scale geologic map of the Valmy 7.5-minute quad (Theodore, 1991 #4319). Compared with other major range-front faults in the region, the Buffalo Mountain fault probably has a small to moderate total displacement as indicated by scattered exposures of upper Paleozoic bedrock on the downthrown block that are stratigraphically equivalent to strata in the upthrown block (Stewart and Carlson, 1978 #3413).
Length (km)	18 km.
Average strike	N46°E
Sense of movement	Normal *Comments:* No specific data available; sense inferred from location in extensional tectonic province. The fault is within the Shoshone extensional area of dePolo (1998 #2845), a tectonic subprovince characterized by NE- and NNE-striking normal

	faults.
Dip Direction	SE
Paleoseismology studies	
Geomorphic expression	Dohrenwend and Moring (1991 #282) mapped parts of the fault as major range-front structures characterized by an abrupt piedmont-hillslope transition, steep bedrock slopes, faceted spurs, and juxtaposition of Quaternary alluvium against bedrock. Wallace (1979 #203) mapped a short (2 km) scarp along the trace, but mainly showed the fault as a lineament along which no young fault scarps are preserved. At 1:24,000 scale, the southeast-facing escarpment of Buffalo Mountain appears highly irregular, suggesting either an irregular fault shape or steep bedrock slopes that are erosionally receded to differing distances from a relatively inactive fault. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 183 m (171–195 m).
Age of faulted surficial deposits	On the basis of reconnaissance photogeologic mapping, Dohrenwend and Moring (1991 #282) show short parts of the fault as formed on surficial deposits or erosion surfaces of middle to early Pleistocene (0.13–1.6 Ma) and late Pleistocene (10–130 ka) age.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Based on age of faulted deposits estimated by Dohrenwend and Moring (1991 #282) the generally irregular geomorphic expression of the range front supports most recent faulting, sometimes much older than 12 ka (Wallace (1979 #203). Conversely, a time of <130 ka is based on ages of faulted deposits estimated by Dohrenwend and Moring (1991 #282).
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 displacement rate of 0.335 mm/yr based on an empirical

	relationship between his preferred maximum basal facet height and vertical 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. In addition, Wallace's (1979 #203) estimate of the timing of the most recent faulting event occurring prior to 12 ka supports a relatively low slip rate. Thus, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	2000 R. Ernest Anderson, U.S. Geological Survey, Emeritus
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. #282 Dohrenwend, J.C., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Winnemucca 1° by 2° quadrangle, Nevada: U.S. Geological Survey Miscellaneous Field Studies Map MF-2175, 1 sheet, scale 1:250,000. #3413 Stewart, J.H., and Carlson, J.E., 1978, Geologic map of Nevada: U.S. Geological Survey, Special Geologic Map, 1, scale 1:500,000. #4319 Theodore, T.G., 1991, Preliminary geologic map of the Valmy quadrangle, Humboldt County, Nevada: U.S. Geological Survey Open-File Report 91-430. #203 Wallace, R.E., 1979, Map of young fault scarps related to earthquakes in north-central Nevada: U.S. Geological Survey Open-File Report 79-1554, 2 sheet, scale 1:125,000.

Search... Search

Home About Us Contacts Legal