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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.

Battle Mountain fault (Class A) No. 1142

Last Review Date: 2000-07-07

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Synopsis	The Battle Mountain fault consists of a main north-striking range-front fault at the western base of Battle Mountain, subsidiary north-striking piedmont faults west of the main fault, and a northeast-striking block-bounding fault in the north part of Battle Mountain. Throw on the fault may not be as great as many other range-bounding faults in the region, as suggested by the exposure of correlative bedrock east and west of the south part of the fault and across its northward projection. It may not be significantly larger than throw on the northeast-striking block-bounding fault. However, the fault west of the Buffalo Valley Mine could have the largest throw if it separates the structural basin beneath the northern Buffalo Valley from the Battle Mountain range block. The main range-bounding fault marks an abrupt topographic inflection between the steep west-facing bedrock escarpment of Battle Mountain and the erosionally dissected downfaulted fan complex marginal to Buffalo Valley. The north part of the western

	fault is marked by a low west-facing scarp on the piedmont slope, but the southern fifth of that fault, in the vicinity of Buffalo Valley Mine, is marked by a dissected topographic step about 40 m high. There are no reports detailing the geomorphic expression of the scarps, but they are estimated to have formed on late Pleistocene surficial deposits or erosion surfaces >12 ka ago.
Name comments	Name from dePolo (1998 #2845), who used the name Battle Mountain fault for the north-striking fault at the western base of Battle Mountain. That fault extends from about 5.7 km south of the Humboldt County line southward to about 4 km south of Timber Creek. Fault includes a northeast-striking fault on the northern face of Battle Mountain, a block-bounding fault west of Buffalo Valley Mine, and a group of west-facing discontinuous scarps on the western piedmont of Battle Mountain. **Fault ID:** Referred to as fault WI10 by dePolo (1998 #2845).
County(s) and State(s)	HUMBOLDT COUNTY, NEVADA LANDER 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	Geologic maps at a scale at 1:24,000-scale by Doebrich (1992 #4313) and Theodore (1991 #4318) show Quaternary faults, but a lack of subdivision of the Quaternary units hinders constraining fault timing. Theodore's map only shows about 1 km of the fault as a Quaternary structure in the southwest part of the North Peak quadrangle. On the basis of reconnaissance photogeology by Dohrenwend and Moring (1991 #282), the Battle Mountain fault is expressed as a main north-striking range-front fault at the western base of Battle Mountain, a subsidiary north-striking fault on the piedmont west of the main fault, and a northeast-striking block-bounding fault on the north face of Battle Mountain. Throw on the main range-bounding fault may not be as great as many other range-bounding faults in the region, as suggested by the

	exposure of correlative bedrock east and west of the south part of the fault and across its northward projection (Theodore, 1991 #4318; Doebrich, 1992 #4313). It may not be significantly larger than throw on the northeast-striking block-bounding fault. However, the fault west of the Buffalo Valley Mine could have the largest throw if it separates the structural basin beneath the northern Buffalo Valley from the Battle Mountain range block. The relationship between the faults in northern Buffalo Valley and the range-front fault is not known.
Length (km)	26 km.
Average strike	N17°E
Sense of movement	Normal *Comments:* No specific slip-sense data are reported; normal sense inferred from location and fault orientation in an extensional tectonic province (dePolo, 1998 #2845).
Dip	62–52° W. *Comments:* Doebrich (1992 #4313) showed the western of the two north-striking faults as having a dip of 62–52° W.; the main fault may have a similar dip.
Paleoseismology studies	
Geomorphic expression	Battle Mountain is a relatively isolated topographic edifice surrounded by Humboldt River Valley on the northeast, Buffalo Valley on the southwest, and the Reese River Valley on the southeast. The main range-bounding fault marks an abrupt topographic inflection between the steep west-facing bedrock escarpment of Battle Mountain and the erosionally dissected downfaulted fan complex marginal to Buffalo Valley. dePolo (1998 #2845) reported a maximum preferred basal facet height of 146 m (122-171 m) for the Battle Mountain range-front fault. There are no reports detailing the geomorphic expression of the fault scarps or of the west-facing scarps in northern Buffalo Valley.
Age of faulted surficial deposits	Late Pleistocene (10–130 ka) deposits appear to be faulted as determined from photogeologic reconnaissance mapping of the piedmont fault by Dohrenwend and Moring (1991). The main

	range-front fault is known only to displace Quaternary deposits and the scarps in northern Buffalo Valley are formed on surficial deposits or erosion surfaces estimated to be middle to early Pleistocene (0.13–1.6 Ma) and (or) late Pleistocene (10–130 ka).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Based on estimate by Dohrenwend and Moring (1991 #282) scarps on the piedmont fault are formed on late Pleistocene surficial deposits or erosion surfaces. Also, Wallace (1979 #203) estimated that those scarps formed >12 ka.
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 0.267 mm/yr for the Battle Mountain fault (his fault WI10) 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 slightly lesser magnitude. Accordingly, 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. #4313 Doebrich, J.L., 1992, Preliminary geologic map of the Antler Peak 7.5 minute quadrangle, Lander County, Nevada: U.S. Geological Survey Open-File Report 92-398. #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. #4318 Theodore, T.G., 1991, Preliminary geologic map of the North Peak quadrangle, Humboldt and Lander Counties, Nevada: U.S. Geological Survey Open-File Report 91-429. #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.