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.

Western Monitor Range fault zone (Class A) No. 1346

Last Review Date: 2011-12-28

citation for this record: **Sawyer, T.L., Lidke, D.J., and Haller, K.M., compilers, 2011, Fault number 1346, Western Monitor Range 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 02:14 PM.**

Synopsis	This long zone of down-to-the-west normal faults bounds the west front of north-northeast-trending Monitor Range and has piedmont faults splaying into Monitor Valley and subparallel bedrock faults within the range; even though these intermontane faults only displace bedrock, they are suspected of Quaternary movement. The southern end of the fault zone appears to connect with the Toquima Range fault zone [1344] along the eastern edge of a narrow bedrock divide between Monitor and Ralston Valleys. The northern end of the fault zone appears to merge with the Northern Monitor Valley fault [1202] along the northern part of the west flank of the Monitor Range. Short scarps along piedmont faults provide evidence for young movement along the fault zone. The principal sources of data consist of photogeologic mapping.

Name comments	Includes the Barley Creek and Morgan Creek faults mapped and named by Schell (1981 #2844), and faults mapped with greater continuity by Dohrenwend and others (1992 #283; 1996 #2846). dePolo (1998 #2845) referred to most of the fault zone depicted here as the Western Monitor Range fault system. The fault zone extends from southernmost Monitor Valley, northeast and northward along the west front of the Monitor Range, to about White Sage Springs. **Fault ID:** Includes faults 74 and 80 on Plate A7 in Schell (1981 #2844) and fault T11 of dePolo (1998 #2845).
County(s) and State(s)	NYE 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; 1996 #2846). 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; 1996 #2846) is 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 long zone of down-to-the-west normal faults bounds the west front of north-northeast-trending Monitor Range and has piedmont faults splaying into Monitor Valley and subparallel bedrock faults within the range.
Length (km)	71 km.
Average strike	N23°E

Sense of movement	Normal *Comments:* (Schell, 1981 #2844; Dohrenwend and others, 1996 #2846)
Dip Direction	W
Paleoseismology studies	
Geomorphic expression	Range front fault that juxtaposes Quaternary alluvium against bedrock, marked by discontinuous scarps and lineaments to the north (Schell, 1981 #2844; Dohrenwend and others, 1992 #283; 1996 #2846). Koehler and Wesnousky (2011 #7175) profiled two degraded single-event fault scarps that are 0.85 m high. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 110 m (85–134 m).
Age of faulted surficial deposits	Dohrenwend and others (1992 #283; 1996 #2846) assigned late Pleistocene or Pleistocene to faulted deposits. Schell (1981 #2844) reported an age range 15-700 ka for the youngest faulted fan deposits and suggested that these deposits probably are no older than 200 ka.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* The timing of the most recent prehistoric faulting event is not tightly constrained. Reconnaissance photogeologic mapping by Dohrenwend and others (1992 #283; 1996 #2846) and photogeologic mapping and some field verification by Schell (1981 #2844) indicates that the most recent prehistoric faulting event is late Pleistocene. Diffusion modeling of two low (0.85-m-high) fault scarps on alluvium near USFS Road 004 suggest the most recent coseismic surface rupture occurred about 44 ka (Koehler and Wesnousky, 2011 #7175).
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 0.214 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. Total amount of vertical displacement in the late Quaternary may be 1.7 m (Koehler and Wesnousky, 2011 #7175). Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	2011 Thomas L. Sawyer, Piedmont Geosciences, Inc. David J. Lidke, U.S. Geological Survey Kathleen M. Haller, 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. #2846 Dohrenwend, J.C., Schell, B.A., Menges, C.M., Moring, B.C., and McKittrick, M.A., 1996, Reconnaissance photogeologic map of young (Quaternary and late Tertiary) faults in Nevada, *in* Singer, D.A., ed., Analysis of Nevada's metal-bearing mineral resources: Nevada Bureau of Mines and Geology Open-File Report 96-2, 1 pl., scale 1:1,000,000. #7175 Koehler, R.D., and Wesnousky, S.G., 2011, Late Pleistocene regional extension rate derived from earthquake geology of late Quaternary faults across the Great Basin, Nevada, between 38.5 degrees N and 40 degrees N latitude: Geological Society of America Bulletin, v. 123, no. 3-4, p. 631–650, doi:10.1130/B30111.1. #7773 Koehler, R.D., III, 2009, Late Pleistocene regional extension rate derived from earthquake geology of late

	Quaternary faults across Great Basin, Nevada between 38.5° and 40° N. latitude: Reno, University of Nevada, unpublished Ph.D. dissertation, 119 p. #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.