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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.

Eastern Monitor Range fault zone (Class A) No. 1349

Last Review Date: 2011-12-28

citation for this record: **Sawyer, T.L., Lidke, D.J., and Haller, K.M., compilers, 2011, Fault number 1349, Eastern 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-east normal faults bounds the east front of north-northeast trending Monitor Range horst block and has several splay and piedmont faults in Little Fish Lake Valley and south of Monitor Range. Reconnaissance photogeologic mapping of tectonic geomorphic features, limited analysis of scarp morphology, and bedrock maps are the sources of data.
Name comments	Includes faults mapped by Schell (1981 #2844), Lowell (1965 #2934), Keith (1987 #2933), and mapped with greater continuity by Dohrenwend and others (1992 #283; 1996 #2846). dePolo (1998 #2845) named the entire fault zone the Eastern Monitor Range fault system. The fault zone extends from U.S. 6 near Yellow Cone, northward along the western side of Stone Cabin Valley and along front of Monitor Range into northernmost Little

	Fish Lake Valley. **Fault ID:** Includes fault 132 and 134 on Plate A7 in Schell (1981 #2844) and faults T12A and T12B 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 of Dohrenwend and others (1996 #2846). Mapping by Schell (1981 #2843; 1981 #2844) based on photogeologic analysis of primarily 1:24,000-scale color aerial photography supplemented with 1:60,000-scale black-and-white aerial photography, transferred by inspection to 1:62,500-scale topographic maps and photographically reduced and directly transferred to 1:250,000-scale topographic maps, and subsequent field verification. Mapping by Dohrenwend and others (1996 #2846) based on photogeologic analysis of 1:58,000-nominal-scale color-infrared photography transferred directly to 1:100,000-scale topographic quadrangle maps enlarged to scale of the photographs.
Geologic setting	This long zone of down-to-the-east normal faults bounds the east front of north-northeast trending Monitor Range and has several splay and piedmont faults in Little Fish Lake Valley and south of Monitor Range.
Length (km)	106 km.
Average strike	N12°E
Sense of movement	Normal *Comments:* (Schell, 1981 #2844; Keith, 1987 #2933; Dohrenwend and others, 1996 #2846)
Dip Direction	E
Paleoseismology studies	

Geomorphic expression	This major range front fault juxtaposes Quaternary alluvium against bedrock and has east and west facing scarps preserved on the piedmont slope along the west side of Little Fish Lake Valley (Dohrenwend and others, 1992 #283; 1996 #2846) and has scarps preserved on piedmont slope in northern West Stone Cabin Valley (Schell, 1981 #2844; Keith, 1987 #2933; Dohrenwend and others, 1996 #2846). Schell (1981 #2844) reported scarps on late Pleistocene alluvium up to 8 m high with slope angles of 27.5° or less (location uncertain). dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 110 m (85–134 m) along the northern part of the fault and 73 m (49–98 m) along the southern part. Koehler and Wesnousky (2011 #7175) reported scarps on old alluvial faults neat Tulle Creek that are 7 to more than 10 m high. Intermediate age surfaces are offset about 2 m near Tulle and Dobin Creek; inset younger surfaces are not offset (Koehler and Wesnousky, 2011 #7571).
Age of faulted surficial deposits	Late Pleistocene and Pleistocene. Dohrenwend and others (1996 #2846) mapped several north-northeast- to north-trending scarps on Quaternary alluvium in Little Fish Lake Valley. Lowell (1965 #2934) also mapped faulted Quaternary alluvium north of Clear Creek Canyon.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Although the timing of the most recent event is not well constrained, reconnaissance photogeologic mapping of scarps by Dohrenwend and others (1996 #2846) and Koehler and Wesnousky (2011 #7571) suggests late Pleistocene.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.214 mm/yr for the northern part of the fault and 0.171 for the southern part of the fault 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 low. 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. #2933 Keith, W.J., 1987, Preliminary geologic map of the McCann 15-minute quadrangle, Nye County, Nevada: U.S. Geological Survey Open-File Report 87-425, scale 1:62,500. #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.

	#2934 Lowell, J.D., 1965, Lower and middle Ordovician stratigraphy in the Hot Creek and Monitor Ranges, Central Nevada: Geological Society of American Bulletin, v. 76, p. 259-266. #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.