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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.

Montezuma Range fault (Class A) No. 1102

Last Review Date: 1998-01-25

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Synopsis	The Montezuma Range fault is a northeast-striking range-bounding fault at the northwest base of the Montezuma Range in the western Basin and Range. Two main slightly overlapping traces are recognized, and they are marked by weak to prominent lineaments or scarps on Quaternary deposits. Little or no information is available on displacement, slip rate, or recurrence interval. The youngest Quaternary deposits displaced by the fault are estimated to be middle to late Pleistocene in age.
Name comments	Name first applied by Schell (1981 #2843) and used by Piety (1995 #915). dePolo (1995 #915) later referred to the fault as the Montezuma Range fault zone. Fault-related features of the Montezuma Range fault have been mapped by Schell (1981 #2843), Dohrenwend and others (1992 #289), and Reheis and Noller (1991 #1195), and they are also shown on a compilation of Quaternary faults by Piety (1995 #915). The northeast-striking

	Montezuma Range fault extends from about Lida Wash, northeastward along the northwestern flank of the Montezuma Range, to about 3 km northeast of Flattop Mountain. **Fault ID:** Shown as fault 11 by Schell (1981 #2843), referred to as MR by Piety (1995 #915), and portrayed as two parts (G6A and G6B) by dePolo (1995 #915).
County(s) and State(s)	ESMERALDA COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location is from Reheis and Noller (1991 #1195) who compiled the fault on a 1:100,000-scale topographic map from photogeologic study of aerial photos at scales ranging from 1:24,000 to 1:80,000.
Geologic setting	The Montezuma Range fault strikes northeast and forms the northwest structural boundary of the Montezuma Range (Dohrenwend and others, 1992 #289) in the western Basin and Range. It is located in the Goldfield section of the Walker Lane belt of Stewart (1988 #1654), an area characterized by a general lack of major through-going northwest-striking strike-slip faults and a scarcity of major Basin and Range faults. The fault is not shown on the geologic map of Esmeralda County, which shows Tertiary strata mapped unbroken across the fault trace (Albers and Stewart, 1972 #3863), suggesting that the total displacement is not large. As mapped photogeologically by Reheis and Noller (1991 #1195), the Montezuma Range fault consists of two main traces with a 3-km-long zone of overlap about midway between Montezuma Peak and Railroad Pass. It splays at its southwest end with one trace extending obliquely across the range to Railroad Pass and the other following the base of the range. It is the eastern fault of a group of northeast-striking, generally down-to-the northwest, faults that extend 25 km westward across Clayton Valley. These faults are similar to several northeast-striking faults that bound ranges and ridges in the area of west central Nevada and adjacent California. They could be conjugate left-slip shears to the northwest-striking right-slip Fish Lake Valley fault zone [49] or normal faults perpendicular to the regional northwest-

	southeast extension direction (Reheis and Noller, 1989 #1610; 1991 #1195). All probably have a normal component of displacement, and there is generally little direct evidence to support left-lateral displacement (Reheis and Noller, 1989 #1610; 1991 #1195).
Length (km)	28 km.
Average strike	N29°E
Sense of movement	Normal
Dip Direction	NW *Comments:* Reheis and Noller (1989 #1610) characterized the Montezuma Range fault as a dip-slip fault that is down to the north, suggesting mostly a normal sense of movement.
Paleoseismology studies	
Geomorphic expression	Dohrenwend and others (1992 #289) portrayed the Montezuma Range fault as a major range-bounding fault that borders a tectonically active range front. Reheis and Noller (1991 #1195) portrayed the traces as weak to prominent lineaments or scarps in Quaternary deposits or as topographic lineaments bounding a linear range front. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 85 m (73-98 m).
Age of faulted surficial deposits	Middle to late Pleistocene. Schell (1981 #2843) estimated that the youngest deposits displaced by the north part of the Montezuma Range fault are 15-200 ka.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Based on estimates by Schell (1981 #2843), the youngest unit displaced by the fault is 15-200 ka and the oldest unit not displaced by the fault is < 15 ka.
Recurrence interval	
Slip-rate	Less than 0.2 mm/yr

category	*Comments:* No detailed data exists to determine slip rates for this fault. dePolo (1998 #2845) assigned a reconnaissance vertical slip rate of 0.184 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.) also support a low slip rate. Accordingly, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	1998 R. Ernest Anderson, U.S. Geological Survey, Emeritus
References	#3863 Albers, J.P., and Stewart, J.H., 1972, Geology and mineral deposits of Esmeralda County, Nevada: Nevada Bureau of Mines and Geology Bulletin 78, 88 p. #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. #289 Dohrenwend, J.C., Schell, B.A., McKittrick, M.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Goldfield 1° by 2° quadrangle, Nevada and California: U.S. Geological Survey Miscellaneous Field Studies Map MF-2183, 1 sheet, scale 1:250,000. #915 Piety, L.A., 1995, Compilation of known and suspected Quaternary faults within 100 km of Yucca Mountain, Nevada and California: U.S. Geological Survey Open-File Report 94-112, 404 p., 2 pls., scale 1:250,000. #1610 Reheis, M.C., and Noller, J.S., 1989, New perspectives on Quaternary faulting in the southern Walker Lane, Nevada and California, *in* Ellis, M.A., ed., Late Cenozoic evolution of the southern Great Basin: Nevada Bureau of Mines and Geology Open-File Report 89-1, p. 57-61. #1195 Reheis, M.C., and Noller, J.S., 1991, Aerial photographic interpretation of lineaments and faults in late Cenozoic deposits in the eastern part of the Benton Range 1:100,000 quadrangle and

	the Goldfield, Last Chance Range, Beatty, and Death Valley Junction 1:100,000 quadrangles, Nevada and California: U.S. Geological Survey Open-File Report 90-41, 9 p., 4 sheets, scale 1:100,000. #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. #1654 Stewart, J.H., 1988, Tectonics of the Walker Lane belt, western Great Basin—Mesozoic and Cenozoic deformation in a zone of shear, *in* Ernst, W.G., ed., Metamorphism and crustal evolution of the western United States, Ruby Volume VII: Englewood Cliffs, New Jersey, Prentice Hall, p. 683-713.

Questions or comments?