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.

Diamond Mountains fault zone (Class A) No. 1212

Last Review Date: 2000-10-01

citation for this record: **Redsteer, M.H., and Machette, M.N., compilers, 2000, Fault number 1212, Diamond Mountains 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 02:17 PM.**

Synopsis	This long fault zone extends nearly 80 km from north to south. The northern part of the fault is defined by a linear, north-south trending series of relatively continuous scarps and expressed by high cliffs along the eastern range front of the Diamond Mountains; the southern part of the fault, from Newark Mountain to the Alhambra Hills along the western side of Little Smokey Valley, is broader, defined by semi-parallel scarps that trend southwest on the valley floor, some of which are east of the range front.
Name comments	Refers to the Diamond Mountains fault zone as named by dePolo (1998 #2845). Mapped by Schell (1981 #2843) and by Dohrenwend and others (1991 #286; 1992 #2480). The fault extends from Conners Creek (east of Portuguese Spring) in the

	southern part of Huntington Valley south along the western margin of Newark Valley to about Pinto Creek on the southeastern flank of the Diamond Mountains and southwest along the western margin of the Little Smokey Valley. **Fault ID:** Refers to fault EY2 of dePolo (1998 #2845). Subdivided into separate faults by Schell (1981 #2843) who suggested they may be related. These separate faults are Little Smoky fault (63), Diamond Peak (85), Christina Peak (86), Rattlesnake Mountain (87), and Strawberry Ranch (84) faults.
County(s) and State(s)	EUREKA COUNTY, NEVADA WHITE PINE COUNTY, NEVADA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location based on 1:250,000-scale maps of Dohrenwend and others (1991 #286; 1992 #2480). Mapping 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. Subsequent mapping by 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 photograph.
Geologic setting	The Diamond Mountains fault is typical of Basin and Range extensional faulting and links the Diamond Mountains to the Fish Springs Range to the south and the Whistler Mountain-Sulfur Springs range to the west. It is a major down-to-the east range front fault on the eastern margin of the Diamond Range and defines the western margin of the Newark Valley. Paleozoic bedrock exposed in the Diamond Mountains by uplift along the Diamond Mountains fault is older to the west (Silurian through Cambrian) and younger to the east (Mississippian and Pennsylvanian), cut by several thrust faults, and folded. Cretaceous strata include freshwater sediments deposited in belts within Paleozoic synforms. Landslide megabreccias composed of these Cretaceous sediments may have been produced during later deformation (Nolan and others, 1971 #4342). Tertiary rocks

	include andesite and ash-flow tuff that is possibly Eocene to Oligocene. At the southern end of the Western Diamond Mountains fault [1211], where traces curve westward, rocks exposed are distinct from others in the Diamond Mountains (Nolan and others, 1971 #4342). The most recent coseismic surface rupture on the southern part of the Diamond Mountains fault may be younger than that to the north.
Length (km)	80 km.
Average strike	N19°E
Sense of movement	Normal
Dip Direction	E *Comments:* Fault is down to the east (Schell, 1981 #2844).
Paleoseismology studies	
Geomorphic expression	The fault zone is mapped as a fairly continuous fault that generally places bedrock against alluvium and as discontinuous scarps on alluvium (Dohrenwend and others, 1991 #286; 1992 #2480). Schell (1981 #2844) mapped individual faults separated by as much as 5 km. The fault zone is marked by high (13- to 35-m-high), moderately defined (13–30° slope angles) scarps at the bedrock-alluvium contact along the eastern range front of the Diamond Mountains (Schell, 1981 #2844). Well-defined linear scarps are preserved west of Rattlesnake and Cedar Mountains. dePolo (1998 #2845) reports a maximum preferred basal fault facet height of 219 m (207–244 m).
Age of faulted surficial deposits	Dohrenwend and others (1991 #2480) and Schell (1981 #2844) show discontinuous parts of the fault as displacing early to middle Pleistocene deposits and late Pleistocene deposits.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Age-category assignment is based on the mostly continuous scarps at the southern end of the fault as shown by Dohrenwend and others (1992 #2480). Schell (1981 #2843; 1981

	#2844) suggests some offset in alluvial units as young as Holocene (<10 ka) in the northern section of this fault but mostly late Pleistocene units are offset.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* dePolo (1998 #2845) assigned a reconnaissance vertical displacement rate of 0.419 mm/yr for the fault based on an empirical relationship between his preferred maximum basal facet height and vertical displacement 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 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. Thus, the less than 0.2 mm/yr slip-rate category has been assigned to this fault.
Date and Compiler(s)	2000 Margaret Hisa Redsteer, U.S. Geological Survey Michael N. Machette, U.S. Geological Survey, Retired
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. #286 Dohrenwend, J.C., Schell, B.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Elko 1° by 2° quadrangle, Nevada and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-2179, 1 sheet, scale 1:250,000. #2480 Dohrenwend, J.C., Schell, B.A., and Moring, B.C., 1992, Reconnaissance photogeologic map of young faults in the Ely 1° by 2° quadrangle, Nevada and Utah: U.S. Geological Survey Miscellaneous Field Studies Map MF-2181, 1 sheet, scale 1:250,000. #4342 Nolan, T.B., Merrriam, C.W., and Brew, D.A., 1971, Geologic map of the Eureka quadrangle, Eureka and White Pine Counties, Nevada: U.S. Geological Survey Miscellaneous

	Geologic Investigations I-612. #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.