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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.

Mesquite fault (Class A) No. 1007

Last Review Date: 1997-05-07

Compiled in cooperation with the Arizona Geological Survey

citation for this record: **Pearthree, P.A., compiler, 1997, Fault number 1007, Mesquite fault, 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 02:19 PM.**

Synopsis	The Mesquite fault displaces middle and upper(?) Pleistocene alluvial-fan deposits on the piedmont west of the Virgin Mountains along the southeastern margin of the Virgin River depression. Early to middle Pleistocene alluvial-fan surfaces are displaced as much as 18 m, and late Pleistocene fan surfaces are displaced as much as 4 m. However, Holocene and some upper Pleistocene fan deposits are not faulted. Morphologic analyses of the fault scarps indicate a late Pleistocene time for the youngest fault rupture.
Name comments	Mapped and named the "Piedmont fault" by Moore (1972 #3461). The tectonic geomorphology of the fault zone was investigated by Mayer (1982 #2090) who named it the Mesquite fault scarp. The

	geology of most of the fault zone was mapped by Billingsley (1995 #2089) and Billingsley and Bohannon (1995 #2088); and Dohrenwend and others (1991 #288) conducted reconnaissance mapping of the western end of the fault.
County(s) and State(s)	MOHAVE COUNTY, ARIZONA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* The fault zone in Arizona is mapped at 1:24,000-scale; the trace was transferred to 1:250,000-scale map. The location of the faults in Nevada are from Dohrenwend and others (1991 #288) 1:250,000 map.
Geologic setting	The Mesquite fault displaces middle and upper(?) Pleistocene alluvial-fan deposits on the piedmont west of the Virgin Mountains along the southeastern margin of the Virgin River depression.
Length (km)	36 km.
Average strike	N28°E
Sense of movement	Normal *Comments:* Inferred from topography and regional relationships.
Dip Direction	NW
Paleoseismology studies	
Geomorphic expression	Quaternary faulting has generated low to moderately high, moderately steep fault scarps in alluvial fan deposits on the western piedmont of the Virgin Mountains. Scarps are up to 1 km downslope from the topographic mountain front. Scarps range in height from about 4 to 30 m, with maximum slopes of 15? to 30?. Morphologic analyses of the fault scarps indicate a late Pleistocene age of youngest fault rupture (Mayer, 1982 #2090).
Age of faulted surficial	Early to middle Pleistocene, late Pleistocene. Lower to middle Pleistocene alluvial-fan surfaces are vertically displaced by as

deposits	much as 18 m (Billingsley and Bohannon, 1995 #2088), whereas upper(?) Pleistocene fan surfaces are displaced by about 2-4 m (estimate of Mayer, 1982 #2090). Holocene and some upper Pleistocene fan deposits are not faulted.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Morphologic analyses of fault scarps by Mayer (1982 #2090) imply a late Pleistocene time for the youngest rupture. Quaternary deposits estimated to be upper Pleistocene are faulted. Some upper Pleistocene and all Holocene deposits are not faulted.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* A low slip rate is inferred based on 2-4 m of displacement of upper(?) Pleistocene deposits (~100 to 200 ka) and 18 m of displacement of lower to middle Pleistocene deposits (~500 ka to 1.0 Ma).
Date and Compiler(s)	1997 Philip A. Pearthree, Arizona Geological Survey
References	#2089 Billingsley, G.H., 1995, Geologic map of the Littlefield quadrangle, northern Mohave county, Arizona: U.S. Geological Survey Open-File Report 95-559, 16 p., 1 pl., scale 1:24,000. #2088 Billingsley, G.H., and Bohannon, R.C., 1995, Geologic map of the Elbow Canyon quadrangle, northern Mohave County, Arizona: U.S. Geological Survey Open-File Report 95-560, 17 p., 1 pl., scale 1;24,000. #288 Dohrenwend, J.C., Menges, C.M., Schell, B.A., and Moring, B.C., 1991, Reconnaissance photogeologic map of young faults in the Las Vegas 1° by 2° quadrangle, Nevada, California, and Arizona: U.S. Geological Survey Miscellaneous Field Studies Map MF-2182, 1 sheet, scale 1:250,000. #2090 Mayer, L., 1982, Quantitative tectonic geomorphology with applications to neotectonics of northwestern Arizona: Tucson, University of Arizona, unpublished Ph.D. dissertation, 213 p.

	#3461 Moore, R.T., 1972, Geology of the Virgin and Beaverdam Mountains, Arizona: Arizona Bureau of Mines Bulletin 186, 65 p., scale 1:62,500.