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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.

Littlefield Mesa faults (Class A) No. 1008

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 1008, Littlefield Mesa faults, 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 numerous, short, generally north-trending intrabasin faults cut high, old basin-floor sediments and high, old river deposits in the Virgin River depression west and north of the town of Littlefield, Arizona. This set of faults vary from northwest to northeast in strike. Upper Pliocene to middle Pleistocene basin-floor deposits and river gravels are displaced less than 10 m across most of the faults, but a few faults have displacements as large as 36 m. The maximum slope angles on the scarps are quite gentle. Conversely, upper Pleistocene and Holocene fan and terrace deposits are not faulted. As a whole, these faults have been active during the middle to late Quaternary, but how individual faults might interact in large earthquakes is unknown.

Name comments	Mapped and named by Menges and Pearthree (1983 #2073); geology of most of the fault zone mapped by Billingsley (1995 #2089) and Billingsley and Bohannon (1995 #2088). Reconnaissance fault mapping of the western part of the zone is by Dohrenwend and others (1991 #288) modified by unpublished field data from Pearthree (unpublished field data, 1997).
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:* Most of the fault zone is mapped 1:24,000; the traces were transferred to a 1:250,000-scale topographic base map for digitization.
Geologic setting	The generally north-trending Littlefield Mesa faults cut high, old basin-floor sediments and old river gravels west and north of the town of Littlefield, Arizona. This set of faults includes many short faults whose trends vary from northwest to northeast. The Pliocene to middle Pleistocene basin-floor deposits are displaced less than 10 m across most of the faults, but a few faults have displacements as large as 36 m (Billingsley, 1995 #2089). Upper Pleistocene and Holocene fan and terrace deposits are not faulted.
Length (km)	21 km.
Average strike	N1°W
Sense of movement	Normal *Comments:* Inferred from topography and regional relations.
Dip Direction	W; E
Paleoseismology studies	
Geomorphic expression	Faulting has produced low to moderately high fault scarps on the carbonate-cemented relict basin-floor deposits. These intrabasin scarps are located in the axial part of the Virgin River depression, well away from the nearest mountain ranges. Limited field

	observations indicate maximum scarp slopes of about 7? on roughly 2-m-high scarps, and as much as 10? on larger scarps (Pearthree, unpublished field data, 1997).
Age of faulted surficial deposits	Pliocene-Pleistocene, early to middle Pleistocene.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Pliocene-Pleistocene to middle Pleistocene deposits and alluvial surfaces are displaced by substantial amounts along some of these faults, so early to middle Quaternary faulting is highly probable. Younger deposits are not extensive along these faults, but locally Holocene to upper Pleistocene deposits are not faulted. Scarps are readily recognizable in the field; limited morphologic observations indicate that late Quaternary fault activity is possible and middle to late Quaternary activity is very likely.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* A low long-term slip rate is inferred based on as much as 36 m of vertical displacement of Plio-Pleistocene deposits and alluvial surfaces across individual faults during the past million years. Most faults have substantially less Quaternary displacement. Slip rate for the whole fault zone is undetermined, and how individual faults might interact in large earthquakes is unknown.
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. #2073 Menges, C.M., and Pearthree, P.A., 1983, Map of neotectonic (latest Pliocene-Quaternary) deformation in Arizona: Arizona Geological Survey Open-File Report 83-22, 48 p., scale 1:500,000.