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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.

Grand Wash fault zone (Class A) No. 1005

Last Review Date: 1997-04-25

Compiled in cooperation with the Arizona Geological Survey

citation for this record: **Pearthree, P.A., compiler, 1997, Fault number 1005, Grand Wash 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 02:19 PM.**

Synopsis	The Grand Wash fault zone is a major normal fault that forms the boundary between the Colorado Plateaus and Basin and Range provinces at this latitude. Thousands of meters of down-to-the-west Cenozoic displacement across this fault zone has formed a deep structural trough, but nearly all of this displacement occurred during the Miocene. Quaternary displacement is restricted to the part of the fault zone that is north of the Colorado River and is on the order of a few meters to perhaps a few tens of meters. Along this part of the fault zone, lower to upper(?) Pleistocene fan deposits and alluvial surfaces are displaced, whereas Holocene deposits are unfaulted. Morphologic analyses of fault scarp based on 14 scarp profiles suggest a late Pleistocene

	age of youngest movement.
Name comments	Mapped by Lucchitta (1967 #2085); also mapped and investigated by Pearthree (unpublished data, 1991) and Menges and Pearthree (1983 #2073).
County(s) and State(s)	MOHAVE COUNTY, ARIZONA
Physiographic province(s)	COLORADO PLATEAUS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Mapped on 1:130,000-scale aerial photos, transferred to 1:250,000-scale topographic map for digitization.
Geologic setting	The Grand Wash fault is a major down-to-the-west normal fault located in the Grand Wash trough, along the western edge of the Shivwitz Plateau. Paleozoic rocks are displaced between 3000 and 5000 m across the fault zone near the Colorado River. A substantial thickness of basin-fill deposits (Muddy Creek Formation, at least 600 m thick) accumulated in the Grand Wash trough as a result of faulting during the middle to late Miocene (Lucchitta, 1967 #2085; 1987 #2086).
Length (km)	35 km.
Average strike	N9°E
Sense of movement	Normal *Comments:* Inferred from topography and stratigraphic displacement.
Dip Direction	W
Paleoseismology studies	
Geomorphic expression	Faulting has generated the high (500 m), steep, embayed Lower Grand Wash Cliffs, which are formed on Paleozoic bedrock. The sinuosity of the cliffs indicate that substantial erosional retreat from the more linear trace of the fault zone has occurred, which in turn implies that the Pliocene-Quaternary fault slip has been low. Fault scarps have been documented in lower to upper(?)

	Pleistocene alluvial-fan deposits. These scarps range in height from about 1 to 15 m and they have maximum slope angles of 4?-27?. The estimated time of the youngest surface rupturing is late Pleistocene (Pearthree and others, 1983 #2083) and is based on 14 scarp profiles.
Age of faulted surficial deposits	Paleozoic, early Pleistocene, and middle to late Pleistocene. Lower to upper(?) Pleistocene deposits are displaced by as much as 10-15 m along the the fault zone well north of the Colorado River. No evidence of Quaternary activity on the fault zone near the Colorado River and farther south has been reported.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Quaternary deposits ranging in age from early to late(?) Pleistocene are faulted. Scarp morphologies suggest a late Pleistocene time of youngest rupture. Holocene alluvial-fan deposits are not faulted.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Pleistocene alluvial surfaces are displaced by less than 15 m , which yields a low average slip rate.
Date and Compiler(s)	1997 Philip A. Pearthree, Arizona Geological Survey
References	#2085 Lucchitta, I., 1967, Cenozoic geology of the upper Lake Mead area adjacent to the Grand Wash Cliffs, Arizona: University Park, Pennsylvania State University, unpublished Ph.D. dissertation, 218 p., 6 sheets. #2086 Lucchitta, I., 1987, The mouth of the Grand Canyon and edge of the Colorado Plateau in the upper Lake Mead area, Arizona, *in* Beaus, S.S., ed., Rocky Mountain Section of the Geological Society of America: Geological Society of America, Centennial Field Guide, v. 2, p. 365-370. #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. #2083 Pearthree, P.A., Menges, C.M., and Mayer, L., 1983, Distribution, recurrence, and possible tectonic implications of late Quaternary faulting in Arizona: Arizona Geological Survey Open-File Report 83-20, 51 p.