

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](#).

Pearson Mesa faults (Class A) No. 2091

Last Review Date: 2016-02-09

Compiled in cooperation with the New Mexico Bureau of Geology & Mineral Resources

citation for this record: Machette, M.N., and Jochems, A.P., compilers, 2016, Fault number 2091, Pearson 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 02:21 PM.

Synopsis	Little is known about these two intrabasin faults other than that they offset the Pleistocene deposits that form Pearson Mesa. They are part of a larger set of faults (mostly unconfirmed) that were mapped in 1965 by Roger Morrison. The two scarps included herein are as large as 5–6 m in height, which suggests they may be the result of two or more faulting events, the youngest of which may have occurred in the late Pleistocene.
Name comments	These faults were mapped by Morrison (1965 #1042) but named by Machette and others (1986 #1033) for Pearson Mesa, a high-level geomorphic surface that slopes northwest about 3–7 km southeast of Franklin, Arizona. The faults displace this surface at

	a location about 15 km southeast of Duncan, Arizona Fault ID: Fault number 8 of Machette and others (1986 #1033).
County(s) and State(s)	HIDALGO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. <i>Comments:</i> Location of the fault is from 1:250,000-scale map of Machette and others (1986 #1033) combined with accurate placement using photogrammetric methods to compile the fault at 1:24,000 scale.
Geologic setting	These two faults, which mark the southeastern margin of the Duncan basin, trend northeast and dip northwest. This trend is anomalous as most Quaternary faults in this region trend north to northwest. However, Drewes and others (1985 #1034) showed several other faults (Pliocene to Pleistocene) to the south that have similar northeast trends.
Length (km)	5 km.
Average strike	N35°E
Sense of movement	Normal
Dip Direction	NW
Paleoseismology studies	
Geomorphic expression	Morrison (1965 #1042) and Machette and others (1986 #1033) showed these scarps on Pearson Mesa, a topographically high, early to middle Pleistocene alluvial surface that forms a broad piedmont at the southeast margin of the Duncan basin. The scarps are about 5–6 m high but only 5 km long. Southeast backtilting between two these subparallel scarps has reversed the northwest-sloping gradient of the mesa, thus forming a small playa between the faults. The scarps have not been studied in detail, but their subdued morphology suggests late Pleistocene (<130 ka), rather than younger (<15 ka) movement. Morrison (1965 #1042) mapped many more faults in the region, but these have not been

	confirmed as being of tectonic origin, and are herein considered to be of probable fluvial origin.
Age of faulted surficial deposits	According to Morrison (1965 #1042), Pearson Mesa is underlain by Kansan (?) alluvium, which would be of early middle Pleistocene age if his correlation with mid-continent glacial stratigraphy is correct. However, no dating has been done that would confirm or deny this correlation, and no volcanic ashes are reported to be associated with Pearson Mesa or its underlying deposits.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) <i>Comments:</i> Maximum timing based on offset of early (?) middle Pleistocene deposits (i.e., 0.5–0.75 Ma), whereas the most recent faulting event is probably late Pleistocene (100 ka), rather than younger (<30 ka) as determined from the subdued morphology of the fault scarps.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> Machette and others (1986 #1033) reported scarps as high as 5–6 m on Pearson Mesa. These scarps may relate to about 5 m of vertical offset in deposits that may be on the order of 0.5–0.75 Ma. These age and offset values suggest low long-term slip rates.
Date and Compiler(s)	2016 Michael N. Machette, U.S. Geological Survey, Retired Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#1034 Drewes, H., Houser, B.B., Hedlund, D.C., Richter, D.H., Thorman, C.H., and Finnell, T.L., 1985, Geologic map of the Silver City 1° x 2° quadrangle New Mexico and Arizona: U.S. Geological Survey Miscellaneous Investigations Map I-1310-C, 1 sheet, scale 1:250,000. #1033 Machette, M.N., Personius, S.F., Menges, C.M., and Pearthree, P.A., 1986, Map showing Quaternary and Pliocene

faults in the Silver City 1° x 2° quadrangle and the Douglas 1° x 2° quadrangle, southeastern Arizona and southwestern New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1465-C, 12 p. pamphlet, 1 sheet, scale 1:250,000.

#1042 Morrison, R.B., 1965, Geologic map of the Duncan and Canador Peak quadrangles Arizona and New Mexico: U.S. Geological Survey Miscellaneous Geologic Investigations I-442, 7 p. pamphlet, 1 sheet, scale 1:48,000.

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