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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.

Mogollon fault (Class A) No. 2012

Last Review Date: 2016-03-01

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 2012, Mogollon 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 02:23 PM.**

Synopsis	This north-trending fault zone cuts basin-fill sediment (reported Miocene to Pleistocene) that is mapped as equivalent to the Gila Conglomerate. The Mogollon fault is the primary east-bounding fault of the Mogollon and Mangas grabens through which the Gila River flows. Drewes and others (1985 #1034) showed the fault as an irregular north- and northwest-trending, major range-bounding structure on the eastern margin of the southern Mangas basin on the 1:250,000-scale geologic map of the Silver City quadrangle. No detailed studies of Quaternary movement of the fault have been made.
Name	The Mogollon fault zone was probably named for its location just

comments	east of Mogollon Creek, near its junction with the Gila River. The name has been updated from “Mogollon fault(s)” to reflect several right-stepping strands located along the northern half of the fault zone. As shown by Leopoldt (1981 #1218), the part of the fault with probable Quaternary movement is restricted to the northeast margin of the Mangas basin and extends from about Davis Canyon on the north to at least latitude 33° on the south (the southern limit of Leopoldt's mapping). However, the older Tertiary trace of the fault extends much farther, from Whitewater Draw (about 5 km west of Mogollon, New Mexico) south to about 10 km northwest of Silver City, New Mexico.
County(s) and State(s)	GRANT COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Good Compiled at 1:24,000 scale. Comments: Traces from 1:24,000-scale map of Leopoldt (1981 #1218) coupled with accurate placement using photogrammetric methods. Traces shown on 1:250,000-scale geologic map of Silver City quadrangle (Drewes and others, 1985 #1034) were not used because Quaternary movement has not been confirmed for this part of the longer Neogene fault. This fault zone trends north and northwest and cuts younger basin-fill sediment (reported Pliocene to Pleistocene), which comprises the upper part of the Gila Conglomerate. In many places it juxtaposes basin-fill sediment against Tertiary and older bedrock, which is uplifted in the adjacent ranges to the east and northeast. The Mogollon fault zone is the primary east-bounding structure of the Mogollon and Mangas grabens through which the Gila River flows.
Geologic setting	This fault zone trends north and northwest and cuts younger basin-fill sediment (reported Pliocene to Pleistocene), which comprises the upper part of the Gila Conglomerate. In many places it juxtaposes basin-fill sediment against Tertiary and older bedrock, which is uplifted in the adjacent ranges to the east and northeast. The Mogollon fault zone is the primary east-bounding structure of the Mogollon and Mangas grabens through which the Gila River flows.

Length (km)	15 km.
Average strike	N37°W
Sense of movement	Normal
Dip	65° W. *Comments:* Leopoldt (1981 #1218) showed a single dip measurement of 65° W.
Paleoseismology studies	
Geomorphic expression	This faults zone offsets the projection of remnants of the Clum Mine Ridge pediment-terrace unit (gravel) of Leopoldt (1981 #1218) 110 m near the Foster Mine (Sec. 32, T. 14 S., R. 16 W.). In most places, the fault zone forms a dissected escarpment between Quaternary–Tertiary basin-fill sediment and uplifted Tertiary rock. Progressive west-side down movement on the fault zone may be responsible for the position of Mogollon Creek, which hugs the northeast margin of the basin.
Age of faulted surficial deposits	The fault zone offsets widely separated erosional remnants of Leopoldt's (1981 #1218) Clum Mine Ridge pediment-terrace unit (gravel). No datable materials have been reported from the deposit, but underlying facies of the basin-fill sediment (Gila Conglomerate) contain late Pliocene volcanic-ash beds (Leopoldt, 1981 #1218) and thus are considered to be upper Pliocene to lower Pleistocene. No surficial deposits of Quaternary age were mapped along the trace of the fault by Leopoldt (1981 #1218). Considering the large amount of post-Pliocene offset, it seems likely that some of the reported offset must have occurred in the Quaternary.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Timing based on offset of upper Pliocene to lower Pleistocene Clum Mine Ridge pediment-terrace unit (gravel) (Leopoldt, 1981 #1218). If his correlations and stratigraphic assemblage is correct, the timing of most recent movement on this fault is at least early Quaternary. Movement on the fault could be younger; however, there does not appear to be younger

	Quaternary deposits along the trace of the fault as mapped by Leopoldt (1981 #1218).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low slip-rate category assigned on basis of 110 m of reported offset of the Clum Mine Ridge pediment that occurred since 5 Ma.
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. #1218 Leopoldt, W., 1981, Neogene geology of the central Mangas graben, Cliff-Gila area, Grant County, New Mexico: Albuquerque, University of New Mexico, unpublished M.S. thesis, 160 p., 1 pl., scale 1:24,000.