

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](#).

Sierra Palomas fault (Class A) No. 1994

Last Review Date: 2016-07-13

citation for this record: Jochems, A.P., compiler, 2016, Fault number 1994, Sierra Palomas 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	Little is known about this east-down fault that forms discontinuous to prominent scarps on the east side of the Carrizalillo Hills in the United States and the Sierra Palomas in Mexico. The fault cuts surfaces of the Mimbres Formation (Pliocene-early Pleistocene) and is buried by younger piedmont-slope alluvium north of the International Boundary. However, the fresh appearance of scarps in Mexico suggests that the fault may have experienced movement in the middle or even late Pleistocene. No detailed studies of the scarps have been reported.
Name comments	The northernmost part of this fault was mapped by Seager and Clemons (1988 #1000) southeast of the Carrizalillo Hills. It extends at least 13 km (and perhaps as much as 20 km) into Chihuahua, Mexico on the east side of the Sierra Palomas for which it is named.
County(s) and	

County(s) and State(s)	LUNA COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. <i>Comments:</i> Fault trace from 1:24,000-scale mapping by Seager and Clemons (1988 #1000) combined with accurate placement using photogrammetric methods.
Geologic setting	This east-down fault forms discontinuous to prominent scarps on the southeast side of the Carrizalillo Hills in the United States and the entire length of the east side of the Sierra Palomas in Mexico. As mapped by Seager and Clemons (1988 #1000), the fault cuts the surface of the Mimbres Formation (Pliocene-early Pleistocene) and is buried by younger piedmont-slope alluvium north of the International Boundary. However, the fresh appearance of fault scarps in Mexico suggests that the fault may have experienced substantially younger movement, post-dating formation of fan surfaces of the Mimbres Formation (Seager, written commun., 2016).
Length (km)	14 km.
Average strike	N22°E
Sense of movement	Normal
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	This east-down fault forms discontinuous scarps north of the International Boundary and fresh-appearing, relatively continuous scarps along its trace in Mexico. The fault appears to form higher scarps on older deposits (Mimbres Formation or equivalent) in Mexico; this observation suggests that the fault may have experienced multiple rupture events in the Quaternary (Wallace, 1977 #166). No field analyses of scarp morphology have been made.
Age of faulted surficial	The fault cuts the geomorphic surface of the Mimbres Formation (Pliocene-early Pleistocene) in the United States but deforms

deposits	younger deposits in Mexico (Seager, written commun., 2016). If the local surface of the Mimbres Formation is constructional in nature, it may be equivalent to the La Mesa and Cuchillo surfaces to the east and northeast. Mack and others (1993 #1020) estimate these surfaces to have formed at 700–900 ka. Fresh-appearing scarps on younger piedmont-slope and alluvial fan deposits in Mexico suggest that the fault has experienced movement in the middle and possibly late Pleistocene.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) <i>Comments:</i> Timing based on deformation of the surface of the Mimbres Formation, which could be equivalent to the 700–900 ka La Mesa and Cuchillo surfaces to the east and northeast (Mack and others, 1993 #1020). Seager (written commun., 2016) notes that the fault appears to cut younger piedmont-slope and alluvial fan deposits in Mexico, and unpublished mapping using aerial photographs at 1:24,000 scale by the compiler suggests that the youngest scarps may have formed on sediments inferred to be middle to late (but not latest) Pleistocene in age (unit Qpo of Seager and Clemons, 1988 #1000, and Seager, 1995 #975).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> The fault is assigned a Quaternary slip rate of less than 0.2 mm/yr based on subdued to moderate scarps formed on middle to late (but not latest) Pleistocene deposits.
Date and Compiler(s)	2016 Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#1020 Mack, G.H., Salyards, S.L., and James, W.C., 1993, Magnetostratigraphy of the Plio-Pleistocene Camp Rice and Palomas formations in the Rio Grande rift of southern New Mexico: American Journal of Science, v. 293, p. 49–77. #975 Seager, W.R., 1995, Geology of southwest quarter of Las Cruces and northwest El Paso 1° x 2° sheets, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 60, 5 sheets, scale 1:125,000.

#1000 Seager, W.R., and Clemons, R.E., 1988, Geology of Hermanas quadrangle, Luna County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 63, 1 sheet, scale 1:24,000.

#166 Wallace, R.E., 1977, Profiles and ages of young fault scarps, north-central Nevada: Geological Society of America Bulletin, v. 88, no. 9, p. 1267–1281.

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