Jump to Navigation

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.

unnamed faults west of Elephant Butte Reservoir (Class A) No. 2106

Last Review Date: 2016-04-05

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

citation for this record: **Machette, M.N., Cikoski, C.T., and Jochems, A.P., compilers, 2016, Fault number 2106, unnamed faults west of Elephant Butte Reservoir, 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	This group of north-trending intrabasin faults form scarps preserved on high-level surfaces related to filling of the Engle basin. Their poorly preserved character suggests they might be of late middle to early late Pleistocene age (100–200 ka). However, no detailed study has been made of fault scarp morphology or the age of Quaternary deposits within and adjacent to the faults.
Name comments	Machette (1987 #960) mapped this group of faults, but did not name them. The faults extend across the piedmont south of the

	San Mateo Mountains about 5–10 km west of Elephant Butte Reservoir.
County(s) and State(s)	SIERRA COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Trace from 1:24,000-scale geologic mapping of Cikoski and Koning (2013 #7354) and unpublished mapping of the Black Bluffs 7.5-minute quadrangle by Cikoski. Elsewhere, fault traces plotted using photogrammetric methods. Some of the faults are also shown on in a generalized manner on the 1:100,000-scale map of Harrison (1993 #1226).
Geologic setting	These unnamed intrabasin faults form small scarps across the piedmont that grades southeast from the San Mateo Mountains. They lie in the northern part of the Engle basin and are generally antithetic to the Walnut Springs fault [2102], which bounds the Fra Cristobal Mountains to the east.
Length (km)	16 km.
Average strike	N20°E
Sense of movement	Normal
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	These faults form small (commonly <5-m-high), mainly discontinuous primarily east-facing scarps on the dissected Cuchillo surface (Cikoski and Koning, 2013 #7354). No data on scarp morphology has been collected from these faults, although they are similar in appearance to those of the Palomas Creek fault [2103] to the southwest. Cikoski (on-going unpublished mapping) determined that at least one of these scarps is the product of monoclinal folding as opposed to fault rupture of the surface. This monocline is interpreted to be a fault propagation fold overlying a down-to-the-east normal fault.

Age of faulted surficial deposits	These faults and folds deform the Palomas gravel (upper part of the Palomas Formation), which forms the constructional Cuchillo surface. This surface was considered to be middle Pleistocene (400–500 ka) by Lozinsky (1986 #1073) and Machette (1987 #960), but more recent studies by Mack and others (1993 #1020) suggested that this surface may be as old as 700–900 ka, thereby providing an older maximum limit on the deformation. However, no detailed mapping of Quaternary deposits along the fault or on the Cuchillo surface has been conducted to help resolve the minimum age of faulted deposits.
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* Timing inferred from similarity with scarps of the Palomas Creek fault [2103], which Machette (1987 #960) suggested is of late middle Pleistocene age (130-250 ka) based on their subdued morphology.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low slip-rate category assigned based on small scarps (<5 high) on a surface that is approximately 700–900 ka (Mack and others, 1993 #1020).
Date and Compiler(s)	2016 Michael N. Machette, U.S. Geological Survey, Retired Colin T. Cikoski, New Mexico Bureau of Geology & Mineral Resources Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#7354 Cikoski, C.T., and Koning, D.J., 2013, Geologic map of the Huerfano Hill quadrangle, Sierra County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 243, scale 1:24,000. #1226 Harrison, R.W., Lozinsky, R.P., Eggleston, T.L., and McIntosh, W.C., 1993, Geologic map of the Truth or Consequences 30 x 60-minute quadrangle (1:100,000 scale): New Mexico Bureau of Mines and Mineral Resources Open-File Report 390, 19 p. pamphlet, 1 sheet, scale 1:100,000.

#1073 Lozinsky, R.R., 1986, Geology and late Cenozoic history of the Elephant Butte area, Sierra County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Circular 187, 40 p., 2 pls.

#960 Machette, M.N., 1987, Preliminary assessment of Quaternary faulting near Truth or Consequences, New Mexico: U.S. Geological Survey Open-File Report 87-652, 40 p.

#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.