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.

West Ceja fault (Class A) No. 1987

Last Review Date: 2016-08-01

citation for this record: **Jochems, A.P., compiler, 2016, Fault number 1987, West Ceja 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 02:25 PM.**

Synopsis	This down-to-the-east intrabasin fault displaces sediment of the Pliocene-Pleistocene Ceja Formation of the Santa Fe Group. Local age constraints for the deformed deposits suggest that they are younger than 3 Ma in age, and the fault may offset the <1.8 Ma Llano de Albuquerque at its northern end.
Name comments	This fault was originally mapped by Kelley (1977 #1106) but he did not assign a name. The fault was also mapped but unnamed by Machette (1982 #1401) and Machette and McGimsey (1983 #1024), who showed it as a down-to-the-west structure. McCraw and others (2006 #7255) named the fault for its location below the Ceja del Rio Puerco along the western edge of the Llano de Albuquerque.
County(s) and State(s)	SOCORRO COUNTY, NEW MEXICO
Physiographic	

Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Compiled from 1:24,000-scale mapping of McCraw and others (2006 #7255) and supplemented with stereogrammetric analysis of aerial photographs in the Veguita 7.5-minute quadrangle.
Geologic setting	The West Ceja fault is an intrabasin fault in the central part of the Albuquerque-Belen basin of the Rio Grande rift. It is located just west of the Sabinal fault [2116] and many unnamed faults cutting the Llano de Albuquerque [2121]. It is unclear whether the fault extends to the Llano de Albuquerque, although there are several mapped but degraded and/or buried scarps that could represent its northern end (Rawling, 2003 #7458)
Length (km)	12 km.
Average strike	N6°W
Sense of movement	Normal
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	In places, the West Ceja fault is manifested as a strongly linear trace cutting sandstone and conglomerate of the Ceja Formation. This down-to-the-east fault displaces Ceja Formation beds up to several (<5) meters and contains at least three calcic paleosols in its hanging wall (McCraw and others, 2006 #7255). Elsewhere, the fault is buried by young (upper Pleistocene to Holocene) valley-slope and stream alluvium as well as windblown sand.
Age of faulted surficial deposits	The fault cuts the upper 12–15 m of the Ceja Formation of the Santa Fe Group, which is considered Pliocene to early Pleistocene in age (Connell, 2008 #7455). Local age constraints for the upper part of the Ceja Formation include the presence of ~3.2 Ma obsidian clasts (Lipman and Mehnert, 1980 #7569; Morgan and others, 2001 #7570) and Blancan fossils (G. Morgan, pers. comm., 2006, in McCraw and others, 2006 #7255). It is unknown whether the fault cuts the Llano de Albuquerque, a diachronous

	early Pleistocene surface younger than ~1.8 Ma (Connell and others, 2000 #7455; Connell and others, 2013 #7235).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* The fault displaces sediment locally correlated to late Pliocene to early Pleistocene deposits. It is possible that the fault cuts the <1.8 Ma Llano de Albuquerque at its northern end.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low-slip rate category based on <5 meters of offset of late Pliocene to early Pleistocene deposits.
Date and Compiler(s)	2016 Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#7506 Connell, S.D., 2008, Refinements to the stratigraphic nomenclature of the Santa Fe Group, northwestern Albuquerque Basin, New Mexico: New Mexico Geology, v. 30, p. 14–35. #7455 Connell, S.D., Love, D.W., Maldonado, F., Jackson, P.B., McIntosh, W.C., and Eppes, M.C., 2000, Is the top of the Santa Fe Group diachronous in the Albuquerque Basin? [abs.], *in* Cole, J.C., ed., Middle Rio Grande basin study—Proceedings of the Fourth Annual Workshop, Albuquerque, New Mexico, February 15–16, 2000: U.S. Geological Survey Open-File Report 00-488, p. 18–20. #7235 Connell, S.D., Smith, G.A., Geissman, J.W., and McIntosh, W.C., 2013, Climatic controls on nonmarine depositional sequences in the Albuquerque Basin, Rio Grande rift, north-central New Mexico, *in* Hudson, M.R., and Grauch, V.J.S., eds., New perspectives on Rio Grande rift basins—From tectonics to groundwater: Geological Society of America Special Paper 494, p. 383–425, doi:10.1130/2013.2494(15) #1106 Kelley, V.C., 1977, Geology of Albuquerque basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources Memoir 33, 60 p., 2 pls.

#7569 Lipman, P.W., and Mehnert, H.H., 1980, Potassium-argon ages from the Mount Taylor volcanic field, New Mexico: U.S. Geological Survey Professional Paper 1124-B, 8 p.

#1401 Machette, M.N., 1982, Quaternary and Pliocene faults in the La Jencia and southern part of the Albuquerque-Belen basins, New Mexico—Evidence of fault history from fault-scarp morphology and Quaternary geology, *in* Grambling, J.A., and Wells, S.G., eds., Albuquerque Country II: New Mexico Geological Society, 33rd Field Conference, November 4-6, 1982, Guidebook, p. 161-169.

#1024 Machette, M.N., and McGimsey, R.G., 1983, Map of Quaternary and Pliocene faults in the Socorro and western part of the Fort Sumner 1° x 2° quadrangles, central New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1465-A, 12 p. pamphlet, 1 sheet, scale 1:250,000.

#7255 McCraw, D.J., Love, D.W., and Connell, S.D., 2006, Geologic map of the Abeytas quadrangle, Socorro County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 121, scale 1:24,000.

#7570 Morgan, G.S., Lucas, S.G., and Love, D.W., 2001, Lithostratigraphy and Pliocene Mammalian biostratigraphy and biochronology at Belen, Valencia County, New Mexico, *in* Connell, S.D., Lucas, S.G., and Love, D.W., eds., Stratigraphy and tectonic development of the Albuquerque Basin, central Rio Grande rift: New Mexico Bureau of Mines and Mineral Resources Open-File Report 454A, p. F43–F45.

#7458 Rawling, G.C., 2003, Geologic map of the Belen 7.5-minute quadrangle, Valencia County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 80, scale 1:24,000.

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