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.

Coyote Springs fault (Class A) No. 2114

Last Review Date: 2016-03-30

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

citation for this record: **Personius, S.F., and Jochems, A.P., compilers, 2016, Fault number 2114, Coyote Springs 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 02:21 PM.**

Synopsis	The Coyote Springs fault (and the Santa Fe [2123] and Loma Pelada [2113] faults to the north and south, respectively) form the active southwestern margin of the Rio Grande rift. Specifically, the Coyote Springs fault forms the southwestern margin of the Belen sub-basin of the Albuquerque basin. Offsets of 12–15 m in lower and middle Pleistocene deposits and 1–3 m in upper Pleistocene deposits indicate recurrent Quaternary movement along the Coyote Springs fault. At its southern end, clear evidence of Quaternary faulting dies out at Mariano Draw, and at its northern end, fault scarps die out about 5 km north of Arroyo Monte Largo.

Name comments	Originally named the Coyote fault by Kelley (1977 #1106), this fault was renamed the Coyote Springs fault by Machette (1982 #1401) and Machette and McGimsey (1983 #1024), after Coyote Spring, which is located near the southwest corner of the Comanche Ranch 7.5-minute quadrangle. The fault is still referred to as the Coyote fault in places (e.g., Grauch and Connell, 2013 #7268), but it should not be confused with the Coyote fault [2128] that forms the western boundary of the Manzanita Mountains on the southeast side of the Belen sub-basin (Personius and others, 1999 #6930). Thus, we retain the name Coyote Springs fault. The fault extends from the southern end of the Santa Fe fault [2123] to the northern end of the Loma Pelada fault [2113] along the northeastern margin of the Sierra Ladrones. **Fault ID:** Fault no. 6 of Machette (1982 #1401), fault no. 5 of Machette and McGimsey (1983 #1024).
County(s) and State(s)	VALENCIA COUNTY, NEW MEXICO SOCORRO COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Fault traces from Machette and McGimsey (1983 #1024) at1:250,00 scale on topographic base map.
Geologic setting	The Coyote Springs fault forms the active southwestern margin of the Belen sub-basin of the Albuquerque basin in the Rio Grande rift (Grauch and Connell, 2013 #7268), with the apparent deactivation of the Comanche fault to the west (Kelley, 1977 #1106). Seismic reflection and 3D geophysical studies support Kelley's assumption that a shallow shelf or bench (Monte Largo bench) underlies the piedmont area between the Coyote Springs and Comanche faults (Russell and Snelson, 1994 #1186; Grauch and Connell, 2013 #7268).
Length (km)	17 km.
Average strike	N21°W
Sense of movement	Normal
Dip	15–17° E.

	Comments: Near the surface the fault probably has a relatively high angle (60°) dip. However, Russell and Snelson (1994 #1186) reported a very shallow dip of 15–17° E for the fault at about 5 km depth based on seismic reflection data. There is some controversy about the listric (shallow curving) nature of faults in the Albuquerque basin.
Paleoseismology studies	
Geomorphic expression	Prominent, but discontinuous (eroded) fault scarps are present on surficial deposits along the central part of the Coyote Springs fault, whereas the youngest scarps are found at the southern end of the fault. Machette (1982) and Machette and McGimsey (1983 #1024) measured offsets of 12–15 m in lower and middle Pleistocene deposits, and 1–3 m in upper Pleistocene deposits. Morphometric studies of the small scarps suggested possible early Holocene or latest Pleistocene ruptures (Machette and McGimsey, 1983 #1024).
Age of faulted surficial deposits	The Coyote Springs fault offsets alluvial-fan deposits of early and middle Pleistocene age as much as 12–15 m along its northern part, and middle and late Pleistocene age along its southern part (Machette and McGimsey, 1983 #1024; Read and others, 2007 #7473).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Fault scarp morphology studies by Machette and McGimsey (1983 #1024) indicate possible latest Pleistocene or early Holocene movement on the southern part of the Coyote Springs fault north of Mariano Draw.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Low slip-rate category assigned based on fault scarp data from Machette (1982 #1401) and Machette and McGimsey (1983 #1024) which indicates offsets of 1–3 m in late Pleistocene (10–150 ka) alluvium and as much as 12–15 m in middle to early

	Quaternary deposits.
Date and Compiler(s)	2016 Stephen F. Personius, U.S. Geological Survey Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#7268 Grauch, V.J.S., and Connell, S.D., 2013, New perspectives on the geometry of the Albuquerque basin, Rio Grande rift, New Mexico: Insights from geophysical models of rift-fill thickness, *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. 427–462, doi:10.1130/2013.2494(16). #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. #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. #6930 Personius, S.F., Machette, M.N., and Kelson, K.I., 1999, Quaternary faults in the Albuquerque area—An update, *in* Pazzaglia, F.J., and Lucas, S.G., eds., Albuquerque geology: New Mexico Geological Society 50th Annual Field Conference, Guidebook, September 22–25, p. 189–200. #7473 Read, A.S., Cather, S.M., Chamberlin, R.M., Connell, S.D., Hook, S.C., and Karlstrom, K.E., 2007, Preliminary geologic map of the Ladron Peak quadrangle, Socorro County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 142, scale 1:24,000.

	#1186 Russell, L.R., and Snelson, S., 1994, Structure and tectonics of the Albuquerque basin segment of the Rio Grande rift—Insights from reflection seismic data, *in* Keller, G.R., and Cather, S.M., eds., Basins of the Rio Grande rift—Structure, stratigraphy, and tectonic setting: Geological Society of America Special Paper 291, p. 83–112.