

# 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 fault south of Red Canyon (Class A) No. 1991

Last Review Date: 2016-07-13

*citation for this record:* Jochems, A.P., compiler, 2016, Fault number 1991, unnamed fault south of Red Canyon, 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.

<b>Synopsis</b>	Little is known about this north-trending normal fault that forms subdued scarps and places middle to late (?) Pleistocene fan alluvium against axial-fluvial deposits of the Palomas Formation (Pliocene-early Pleistocene). The down-to-the-west fault is located 1.5–2 km west of the central section of the Caballo fault [2088b], south of Red Canyon and east of the Rio Grande. No detailed studies of the fault have been made.
<b>Name comments</b>	This unnamed fault was mapped by Jochems and Koning (2015 #7348) as extending 5 km southwest from a point 1.5 km south of Red Canyon. The fault parallels the central section of the Caballo fault [2088b], and likely meets it at or near its juncture with the northern (non-Quaternary) section of the Caballo fault.
<b>County(s) and</b>	

<b>County(s) and State(s)</b>	SIERRA COUNTY, NEW MEXICO
<b>Physiographic province(s)</b>	BASIN AND RANGE
<b>Reliability of location</b>	Good Compiled at 1:24,000 scale.  <i>Comments:</i> Fault trace from 1:24,000-scale mapping by Jochems and Koning (2015 #7348) combined with accurate placement using photogrammetric methods.
<b>Geologic setting</b>	This north-trending down-to-the-west normal fault places middle to perhaps late Pleistocene alluvial fan sediment against axial-fluvial sand and gravel of the Palomas Formation (Pliocene-early Pleistocene). Along its northern half, the fault forms discontinuous scarps on the piedmont fanglomerate facies of the Palomas Formation. The fault is located 1.5–2 km west of the central section of the Caballo fault [2088b], and likely meets the latter at or near its juncture with the northern (non-Quaternary) section of the Caballo fault.
<b>Length (km)</b>	5 km.
<b>Average strike</b>	N25°E
<b>Sense of movement</b>	Normal
<b>Dip Direction</b>	W
<b>Paleoseismology studies</b>	
<b>Geomorphic expression</b>	This fault forms subdued (<5 m) scarps on alluvial fan sediment and axial-fluvial sand and gravel of the Palomas Formation. Scarps typically become more subtle and discontinuous along the northern half of the fault where it cuts piedmont fanglomerate facies of the Palomas Formation. The northern end of the fault does not exhibit strong surface expression but likely meets the central Caballo fault [2088b] near its juncture with the northern (non-Quaternary) section of the Caballo fault. In places, the fault is buried by eolian sand and/or sheetwash and colluvium that may be 2-3 m thick; these deposits may feature cumulic soils but typically lack carbonate soil development, though stage I soils are possible (Jochems and Koning, 2015 #7348).

<b>Age of faulted surficial deposits</b>	The fault deforms axial-fluvial sediment of the Palomas Formation (Pliocene-early Pleistocene) as well as younger alluvial fan deposits inset into the Cuchillo surface east of the Rio Grande. The position of the fan sediments below the Cuchillo surface (700–900 ka; Mack and others, 1993 #1020) implies that they were deposited in the middle to perhaps late (but not latest) Pleistocene (Jochems and Koning, 2015 #7348). Seager and Mack (2003 #7347) suggest that these deposits (unit Qvo of Seager and Mack, 2005 #1257) correlate to the Picacho and Tortugas morphostratigraphic units of the Mesilla Basin, thought to be 50–150 and 150–250 ka in age, respectively (Gile and others, 1981 #7360). The fault does not rupture Holocene valley-floor sediment (Jochems and Koning, 2015 #7357).
<b>Historic earthquake</b>	
<b>Most recent prehistoric deformation</b>	middle and late Quaternary (<750 ka)  <i>Comments:</i> Timing based on deformation of alluvial fan sediment that is no younger than late (and much more likely middle) Pleistocene in age. These deposits are inset into the Cuchillo surface which is thought to have formed 700–900 ka (Mack and others, 1993 #1020). The fault is buried by younger deposits inferred to be late Pleistocene to Holocene in age (Jochems and Koning, 2015 #7357).
<b>Recurrence interval</b>	
<b>Slip-rate category</b>	Less than 0.2 mm/yr  <i>Comments:</i> The fault is assigned a slip rate of less than 0.2 mm/yr based on its subdued (<5 m) scarps on surfaces of deposits that are no younger than late (and much more likely middle) Pleistocene in age.
<b>Date and Compiler(s)</b>	2016 Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
<b>References</b>	#7360 Gile, L.H., Hawley, J.W., and Grossman, R.B., 1981, Soils and geomorphology in the Basin and Range area of southern New Mexico—Guidebook to the Desert Project: New Mexico Bureau of Mines and Mineral Resources Memoir 39, 222 p.  #7348 Jochems, A.P., and Koning, D.J., 2015, Geologic map of

the Williamsburg 7.5-minute quadrangle, Sierra County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 250, scale 1:24,000.

#7357 Jochems, A.P., and Koning, D.J., 2015, Holocene stratigraphy and a preliminary geomorphic history for the Palomas Basin, south-central New Mexico: New Mexico Geology, v. 37, p. 77–88.

#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.

#7347 Seager, W.R., and Mack, G.H., 2003, Geology of the Caballo Mountains, New Mexico: New Mexico Bureau of Geology and Mineral Resources Memoir 49, 136 p.

#1257 Seager, W.R., and Mack, G.H., 2005, Geology of Caballo and Apache Gap quadrangles, Sierra County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Geologic Map 74, 1 sheet, scale 1:24,000.

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