

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](#).

Little San Pasqual Mountain fault (Class A) No. 1995

Last Review Date: 2016-07-25

citation for this record: Jochems, A.P., and Love, D.W., compilers, 2016, Fault number 1995, Little San Pasqual Mountain 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.

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| Synopsis | This down-to-the-northwest fault forms a prominent linear boundary along the northwest flank of Little San Pasqual Mountain. The fault juxtaposes axial-fluvial facies of the Sierra Ladrones Formation (Plio-Pleistocene) with Permian and Pennsylvanian strata and may exhibit stratigraphic displacement of up to 410 m. Activity on the fault is unconstrained but may be early or middle Pleistocene if truncated basin-fill deposits underlie a 700–800 ka geomorphic surface. |
| Name comments | Named by the compilers for its location bounding Little San Pasqual (or Pascual) Mountain in southern Socorro County. Previously unnamed. |
| County(s) and | SOCORRO COUNTY, NEW MEXICO |

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| State(s) | SUCURRO COUNTY, NEW MEXICO |
| Physiographic province(s) | BASIN AND RANGE |
| Reliability of location | <p>Good Compiled at 1:24,000 scale.</p> <p><i>Comments:</i> Compiled from 1:18,000-scale (approximate) map of Little San Pasqual Mountain by Geddes (1963 #7563) and supplemented with 1:24,000-scale mapping using aerial photographs and stereogrammetric analysis. Fault is also shown on 1:380,160-scale map of Dane and Bachman (1961 #7561).</p> |
| Geologic setting | <p>The Little San Pasqual Mountain fault forms the northwest boundary of Little San Pasqual Mountain, a north-northeast-trending anticline composed primarily of Permian and Pennsylvanian strata (Geddes, 1963 #7562, #7563). This fold is located within the Rio Grande rift at the approximate boundary between the northern Jornada del Muerto and San Marcial basins, termed the San Pascual platform by Kelley (1952 #7564). The fault juxtaposes upper Paleozoic rocks with basin-fill of the Santa Fe Group that likely correlates to axial-fluvial facies of the Sierra Ladrones Formation mapped in the San Antonio SE 7.5-minute quadrangle to the north (Cikoski, 2012 #7446). Using gravity measurements, Geddes (1963 #7563) identified both the Little San Pasqual Mountain fault and another buried fault to the northwest; he estimated a thickness of nearly 2300 m of Santa Fe Group basin-fill in the hanging walls of these faults. Stratigraphic displacement along the Little San Pasqual Mountain fault is estimated at approximately 180–410 m.</p> |
| Length (km) | 6 km. |
| Average strike | N32°E |
| Sense of movement | Normal |
| Dip Direction | NW |
| Paleoseismology studies | |
| Geomorphic expression | The fault forms a prominent lineation along the northwest flank of Little San Pasqual Mountain. The lineation dies out to the northeast where the fault appears to be buried by Plio-Pleistocene |

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| | basin-fill of the Sierra Ladrones Formation. |
| Age of faulted surficial deposits | No direct geochronologic constraints exist for the Little San Pasqual Mountain fault. To the north, flat-lying Sierra Ladrones Formation sediments at a similar elevation as those truncated by the fault underlie a geomorphic surface thought to correlate to 700–800 ka surfaces elsewhere in the Rio Grande rift (Mack and others, 1993 #1020; Cikoski, 2012 #7446; Connell and others, 2013 #7235). However, Kelley (1952 #7564) suggested that geomorphic surfaces in the San Marcial basin are erosional, in which case the youngest local deposition of Sierra Ladrones deposits cannot be assessed with confidence. Small deposits of windblown sand and alluvial fan sediment along the fault do not appear to be offset. |
| Historic earthquake | |
| Most recent prehistoric deformation | undifferentiated Quaternary (<1.6 Ma) <i>Comments:</i> No age constraints are available for the Little San Pasqual Mountain fault. If truncated deposits of the Sierra Ladrones Formation underlie a 700–800 ka depositional surface, movement on the fault may be constrained to the early or middle Pleistocene. |
| Recurrence interval | |
| Slip-rate category | Less than 0.2 mm/yr <i>Comments:</i> The slip-rate category is based on low rates of slip on similar faults in this part of the Rio Grande rift. |
| Date and Compiler(s) | 2016 Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources David W. Love, New Mexico Bureau of Geology & Mineral Resources |
| References | #7446 Cikoski, C.T., 2012, Geologic map of the San Antonio SE 7.5-minute quadrangle, Socorro County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 228, scale 1:24,000. #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)

#7561 Dane, C.H., and Bachman, G.O., 1961, Preliminary geologic map of the southwestern part of New Mexico: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-344, scale 1:380,160.

#7562 Geddes, R.W., 1963, Geology of Little San Pasqual Mountain, *in* Kuellmer, F.J., ed., Socorro region: New Mexico Geological Society, 14th Field Conference, October 4–6, 1963, Guidebook, p. 197–203.

#7563 Geddes, R.W., 1963, Structural geology of Little San Pasqual Mountain and the adjacent Rio Grande trough: Socorro, New Mexico Institute of Mining and Technology, unpublished M.S. thesis, 75 p., 1 pl.

#7564 Kelley, V.C., 1952, Tectonics of the Rio Grande depression of central New Mexico, *in* Johnson, R.B., and Read, C.B., eds., *Rio Grande County: New Mexico Geological Society, 3rd Field Conference, October 3–5, 1952, Guidebook*, p. 92–105.

#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.

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