

# 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](#).

## Sunshine Valley faults (Class A) No. 2016

Last Review Date: 2016-06-27

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

*citation for this record:* Kelson, K.I., and Jochems, A.P., compilers, 2016, Fault number 2016, Sunshine Valley faults, 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.

<b>Synopsis</b>	The Sunshine Valley faults are a series of north-striking, mostly down-to-the-east normal faults within the southern San Luis basin 7 km west of the Southern Sangre de Cristo fault [2017]. Elongate ridges of middle (?) Pleistocene alluvium on the upthrown side of the faults, alignment of vegetation, and possible ponded alluvium on the downthrown (upstream) side of the faults suggest that the faults have middle to late Pleistocene movement.
<b>Name comments</b>	The Sunshine Valley faults consist of several parallel, north-trending faults that were mapped by Colton (1976 #1136), Machette and Personius (1984 #1113), Personius and Machette (1984 #1124), and Thompson and others (2014 #7539) between

	<p>Guadalupe and Ute Mountains in Sunshine Valley. The faults were regarded as the southern extension of the Mesita fault [2015] by Colton (1976 #1136), but Machette and Personius (1984 #1113) and Personius and Machette (1984 #1124) considered the Sunshine Valley faults as separate structures because of a lack of continuity with and an opposite sense of displacement from the Mesita fault. The longest of these faults extends from a point 5 km due west of the village of El Rito to a point 6 km east of Ute Mountain.</p>
<b>County(s) and State(s)</b>	TAOS COUNTY, NEW MEXICO
<b>Physiographic province(s)</b>	SOUTHERN ROCKY MOUNTAINS
<b>Reliability of location</b>	<p>Good Compiled at 1:24,000 scale.</p> <p><i>Comments:</i> Fault traces from 1:24,000-scale mapping of Thompson and others (2014 #7539) and unpublished mapping by C.A. Ruleman (pers. comm., 2016). The Sunshine Valley faults were originally mapped by Colton (1976 #1136), and later compiled and interpreted by Machette and Personius (1984 #1113) and Personius and Machette (1984 #1124) at a scale of 1:250,000.</p>
<b>Geologic setting</b>	<p>The Sunshine Valley faults lie within the southern San Luis basin, and are parallel to the rift-margin Southern Sangre de Cristo fault [2017] to the east. The limited length of the faults, mostly down-to-the-east displacement, and parallelism with the Southern Sangre de Cristo fault suggest that the Sunshine Valley faults may be antithetic to the main rift-margin fault, comparable to antithetic structures interpreted by Kluth and Schaftenaar (1994 #1183) and Brister and Gries (1994 #1178) in the northern San Luis basin. The faults include a series of faults cutting Servilleta basalt (3–3.5 Ma) on the west side of and crossing the Rio Grande north of Cerro Chiflo due to their similar orientation. The total vertical separation of Pleistocene alluvium across the faults is probably less than 5 m (Machette and Personius, 1984 #1113; Personius and Machette, 1984 #1124).</p>
<b>Length (km)</b>	14 km.
<b>Average strike</b>	N4°E
<b>Sense of</b>	

<b>Sense of movement</b>	Normal
<b>Dip Direction</b>	E  <i>Comments:</i> There are no deep structural data published for the Sunshine Valley faults, so down-dip fault geometries are unknown.
<b>Paleoseismology studies</b>	
<b>Geomorphic expression</b>	The Sunshine Valley faults have little geomorphic expression, but are associated with elongate ridges of middle (?) Pleistocene alluvium, ponded younger alluvium, and vegetation lineaments. The faults have uphill- (east) facing scarps that are easily buried by alluvium. One fault in the northern part of the group forms a 4- to 6-m-high east-facing scarp.
<b>Age of faulted surficial deposits</b>	Machette and Personius (1984 #1113), Personius and Machette (1984 #1124), and Thompson and others (2014 #7539) suggest displacement of middle (?) to late Pleistocene alluvium along the Sunshine Valley faults.
<b>Historic earthquake</b>	
<b>Most recent prehistoric deformation</b>	late Quaternary (<130 ka)  <i>Comments:</i> The most recent event post-dates probable middle (?) Pleistocene alluvium (Machette and Personius, 1984 #1113; Personius and Machette, 1984 #1124; Thompson and others, 2014 #7539).
<b>Recurrence interval</b>	
<b>Slip-rate category</b>	Less than 0.2 mm/yr  <i>Comments:</i> Low slip-rate category assigned based on data of Machette and Personius (1984 #1113), Personius and Machette (1984 #1124), and Thompson and others (2014 #7539) who noted that the Sunshine Valley faults probably displace late Pleistocene alluvium less than 5 m.
<b>Date and Compiler(s)</b>	2016 Keith I. Kelson, William Lettis & Associates, Inc.

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**References**

#1178 Brister, B.S., and Gries, R.R., 1994, Tertiary stratigraphy and tectonic development of the Alamosa basin (northern San Luis Basin), Rio Grande rift, south-central Colorado, *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. 39-58.

#1136 Colton, R.B., 1976, Map showing landslide deposits and late Tertiary and Quaternary faulting in the Fort Garland-San Luis area, Colorado-New Mexico: U.S. Geological Survey Open-File Report 76-185, 1 sheet, scale 1:250,000.

#1183 Kluth, C.F., and Schaftenaar, C.H., 1994, Depth and geometry of the northern Rio Grande rift in the San Luis Basin, south-central Colorado, *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. 27-37.

#1113 Machette, M.N., and Personius, S.F., 1984, Map of Quaternary and Pliocene faults in the eastern part of the Aztec 1° by 2° quadrangle and the western part of the Raton 1° by 2° quadrangle, northern New Mexico: U.S. Geological Survey Miscellaneous Field Studies Map MF-1465-B, 1 sheet, scale 1:250,000.

#1124 Personius, S.F., and Machette, M.N., 1984, Quaternary and Pliocene faulting in the Taos Plateau region, northern New Mexico, *in* Baldrige, W.S., Dickerson, P.W., Riecker, R.E., and Zidek, J., eds., Rio Grande rift—Northern New Mexico: New Mexico Geological Society, 35th Field Conference, October 11-13, 1984, Guidebook, p. 83–90.

#7539 Thompson, R.A., Turner, K.J., Shroba, R.R., Cosca, M.A., Ruleman, C.A., Lee, J.P., and Brandt, T.R., 2014, Geologic map of the Sunshine Mountain 7.5' quadrangle, Taos County, New Mexico: U.S. Geological Survey Scientific Investigations Map SIM-3283, scale 1:24,000.

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