

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 Florida Mountains fault (Class A) No. 2075

Last Review Date: 2016-01-06

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

citation for this record: Machette, M.N., and Jochems, A.P., compilers, 2016, Fault number 2075, West Florida Mountains 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 02:22 PM.

Synopsis	This late Quaternary fault offsets piedmont-slope deposits that flank the western margin of the Florida Mountains. The scarps are small (<5 m high), but may reflect two episodes of movement. Studies of scarp morphology have been made along the central part of the fault, but no trenching or detailed mapping has been done.
Name comments	The West Florida Mountains fault was named by Clemons (1984 #999) for its location along the western flank of the Florida Mountains. However, on a later structural index map of the area

	(Seager, 1995 #975), the name Treasure Mountain fault zone was extended from the north to include the aforementioned fault. We retain the original name for this compilation. Under this definition, the West Florida Mountains fault extends from about 1 km south of U.S. Interstate Highway 10, south across the piedmont apron of the Little Florida and Florida Mountains to the White Hills (South Peak 7.5-minute quadrangle, New Mexico).
County(s) and State(s)	LUNA COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. <i>Comments:</i> Digitized trace of the fault is from 1:24,000-scale mapping of Clemons (1984 #999; 1985 # 998) combined with photogrammetric interpretations of aerial photographs.
Geologic setting	This curving, but generally south-southwest trending, down-to-the-west fault offsets the piedmont slope that flanks the western margin of the Florida and Little Florida Mountains (Clemons, 1984 #999). Clemons (1984 #999) estimated that there may be 900–1,200 m of total vertical offset on the fault, most of which resulted from Miocene uplift and eastward tilting of the Florida and Little Florida Mountains. The fault may be a southward continuation of the Treasure Mountain fault (Cenozoic) as mapped by Seager (1995 #975).
Length (km)	20 km.
Average strike	N14°E
Sense of movement	Normal
Dip Direction	W <i>Comments:</i> Clemons (1984 #999) showed the fault as having a relatively high angle dip in his cross section A.
Paleoseismology studies	
Geomorphic	The fault forms conspicuous scarps on the piedmont slope that

<p>expression</p>	<p>flanks the western margin of the Florida Mountains. The scarps are subtle yet conspicuous on aerial photographs owing to different types of vegetation (plant associations) on the upthrown and downdropped surfaces. Morphology studies (Machette, unpubl. data, 1980) indicate that the scarps within a kilometer of Florida Road (access road to Rock Hound State Park, northwest part of the Florida Mountains) are 3.2–4.6 m high and have maximum scarp-slope angles of 2.3–6.2°, whereas the adjacent piedmont commonly has a slope angle of 1–1.5°. These scarps are obviously old, but may reflect two faulting events because of the amount of offset associated with the scarps (>3 m) and the presence of compound scarp-slope angles. The morphology of the youngest elements of the scarp resemble the Santa Rita scarps (100 ka in Pearthree and Calvo, 1987 #1023) of southeastern Arizona, whereas the morphometric data for total scarp height plot well below (older than) that of the Santa Rita scarps.</p>
<p>Age of faulted surficial deposits</p>	<p>The fault offsets piedmont-slope deposits (Mimbres Formation and younger equivalents) that flank the western margin of the Florida Mountains (Clemons, 1984 #999). Machette conducted a short reconnaissance of the fault in the summer of 1980. The soils that are offset along the largest scarps typically have a 75–100 cm thick stage III to stage IV calcareous B (Bk) horizon (Machette, unpubl. data, 1980). Similarly developed soils in southern New Mexico are commonly of middle Pleistocene age (Machette, 1985 #1267). The smallest (unprofiled) scarps are formed on deposits that have a 40-cm-thick reddish brown argillic B (Bt) horizon over a 30-cm-thick stage II calcareous B (Bk) horizon, which is probably of late middle (200 ka) to late Pleistocene (100 ka) age. Conversely, alluvium that may be latest Pleistocene to Holocene in age is not offset by the fault.</p>
<p>Historic earthquake</p>	
<p>Most recent prehistoric deformation</p>	<p>late Quaternary (<130 ka)</p> <p><i>Comments:</i> Clemons (1984 #999) stated that the fault remained active, at least intermittently, into the Pleistocene. The youngest unit (Qpa) he shows offset is of Pleistocene and/or Holocene age. However, as determined from unpublished soil and scarp morphology data, it appears that the fault scarps may be the result to two faulting events, the youngest of which occurred about 100 ka.</p>

Recurrence interval	
Slip-rate category	<p>Less than 0.2 mm/yr</p> <p><i>Comments:</i> The slip rate must be low as evidenced by small scarps (2.3–4.6 m) on deposits of middle to late (?) Pleistocene age (estimated to be 100–200 ka). There is no evidence that movement has occurred in latest Pleistocene or Holocene time (past 15 ka), to perhaps as long ago as 100 ka.</p>
Date and Compiler(s)	<p>2016</p> <p>Michael N. Machette, U.S. Geological Survey, Retired Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources</p>
References	<p>#999 Clemons, R.E., 1984, Geology of Capitol Dome quadrangle, Luna County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 56, 1 sheet, scale 1:24,000.</p> <p>#998 Clemons, R.E., 1985, Geology of South Peak quadrangle, Luna County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 59, 1 sheet, scale 1:24,000.</p> <p>#1267 Machette, M.N., 1985, Calcic soils of the southwestern United States, <i>in</i> Weide, D.L., ed., Soils and Quaternary geology of the southwestern United States: Geological Society of America Special Paper 203, p. 1–21.</p> <p>#1023 Pearthree, P.A., and Calvo, S.S., 1987, The Santa Rita fault zone—Evidence for large magnitude earthquakes with very long recurrence intervals, Basin and Range province of southeastern Arizona: Bulletin of the Seismological Society of America, v. 77, p. 97-116.</p> <p>#975 Seager, W.R., 1995, Geology of southwest quarter of Las Cruces and northwest El Paso 1° x 2° sheets, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 60, 5 sheets, scale 1:125,000.</p>

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