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.

Artillery Range fault, northern section (Class A) No. 2051a

Last Review Date: 2015-12-15

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

citation for this record: **Machette, M.N., and Jochems, A.P., compilers, 2015, Fault number 2051a, Artillery Range fault, northern section, 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	**General:** This major basin-bounding fault crosses the eastern piedmont of the Organ Mountains and bounds bedrock hills (northern part of Franklin Mountains) that underlie the hydrologic divide between the Mesilla and Hueco basins, north of Anthony Gap. The mapped fault trace is entirely within Quaternary deposits; the northern section forms prominent scarps on deposits of middle to late Quaternary age, whereas the southern section forms large, older fault-line scarps on deposits of early to middle Quaternary age. No detailed studies have been performed on this fault owing to its location in a restricted military area.

	Sections: This fault has 2 sections. The division into two sections is based on apparent differences in recency of movement and geomorphic expression for the northern and southern parts of fault.
Name comments	**General:** Named by Seager (1981 #968) for the location of the fault within Fort Bliss Anti-Aircraft (Artillery) Range. The fault extends from about 6.5 km south of White Sands, New Mexico (where it splays southwestward from the Organ Mountains fault [2052]), south and then west into a major embayment east of Anthony Gap. The name was extended by Kelley and Matheny (1983 #1005) southward to the northern end of the Franklin Mountains, where the fault joins the East Franklin Mountains fault [900] about 1 km north of the New Mexico-Texas state boundary. **Section:** As defined herein, this section extends from about 6.5 km south of White Sands, New Mexico, to the westernmost trace of the fault in the gap between the Organ and Franklin Mountains. The southern boundary is based on the mapping of Seager and others (1987 #627), which shows a fairly continuous trace north of this point. To the south, the fault's trace is primarily concealed beneath surficial deposits. **Fault ID:** Referred to as fault 5 on figure 1 and table 2 of Machette (1987 #847).
County(s) and State(s)	DONA ANA COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Original mapped trace from 1:125,000 scale mapping of Seager (1987 #627). Most of the fault is shown at 1:31,250 scale by Seager (1981 #968). The location of the fault was digitized at 1:24,000 scale using photogrammetry to accurately map its trace from these maps.
Geologic setting	The fault is part of a longer fault system that extends from the latitude of Capital Peak in northern White Sands Proving Grounds south to Juarez, Mexico. It joins the Organ Mountains fault

	[2052] on the north and the East Franklin Mountains fault [900] on the south. The Artillery Range fault is different in that its mapped trace is entirely within Quaternary deposits, whereas other parts of the long system are at the eastern margin of strongly uplifted bedrock-cored ranges. The northern section of the fault forms the eastern margin of an intermediate-level structural block that is bounded on the west by the Organ Mountains fault [2052].
Length (km)	This section is 22 km of a total fault length of 34 km.
Average strike	N6°E (for section) versus N7°W (for whole fault)
Sense of movement	Normal
Dip Direction	E *Comments:* High-angle normal fault based on drill holes in basin-fill sediment and gravity data (Seager, 1981 #968). No specific measurements have been made, but dips of 60–75° E. have been observed on the Organ Mountains fault [2052] to the north. Likewise, steep easterly dips were measured along the East Franklin Mountains fault [900] to the south.
Paleoseismology studies	
Geomorphic expression	The fault forms nearly continuous scarps on piedmont-slope and alluvial-fan deposits of the southern Organ Mountains. Near its northern end, the fault zone forms a complex pattern comprised of a main fault, 4–6 subsidiary normal faults, and a basinward horst. No scarp heights are mentioned by Seager (1981 #968), but topographic maps of the fault commonly show differential relief of 6–12 m across the scarps (Machette, 1987 #847). Seager (written commun., 1998) says the fault scarps are prominent and steep, suggesting a late Pleistocene or Holocene age. The scarps are clearly larger on older parts of the landscape, demonstrating repeated movement through the Quaternary.
Age of faulted surficial deposits	Seager (1981 #968) showed the fault as cutting middle to early Pleistocene alluvial-fan deposits (post Camp Rice Formation).
Historic earthquake	

Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* In Seager's (1981 #968) discussion of the Organ Mountains [2052] and Artillery Range [2051] faults, he mentioned scarps on Holocene deposits. However, his mapping (Seager, 1981 #968; Seager and others, 1987 #627) showed fault scarps on middle to late Pleistocene deposits (unit Qpo), but no scarps on younger units (Qpa or Qpy). Thus, we cannot be sure that latest Pleistocene or Holocene movement has occurred along this section of the fault. No detailed analyses of scarp morphology or detailed mapping of the youngest faulted deposits has been conducted for this fault.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* A low slip rate inferred on the basis of 6- to 12-m-high scarps (measured from topographic maps) on deposits that are probably early late Pleistocene (100–130 ka) or older.
Date and Compiler(s)	2015 Michael N. Machette, U.S. Geological Survey, Retired Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#1005 Kelley, S., and Matheny, J.P., 1983, Geology of Anthony quadrangle, Doña Ana County, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 54, 1 sheet, scale 1:24,000. #847 Machette, M.N., 1987, Preliminary assessment of paleoseismicity at White Sands Missile Range, southern New Mexico—Evidence for recency of faulting, fault segmentation, and repeat intervals for major earthquakes in the region: U.S. Geological Survey Open-File Report 87-444, 46 p. #968 Seager, W.R., 1981, Geology of Organ Mountains and southern San Andres Mountains, New Mexico: New Mexico Bureau of Mines and Mineral Resources Memoir 36, 97 p., 4 pls. #627 Seager, W.R., Hawley, J.W., Kottlowski, F.E., and Kelley, S.A., 1987, Geology of east half of Las Cruces and northeast El Paso 1° x 2° sheets, New Mexico: New Mexico Bureau of Mines and Mineral Resources Geologic Map 57, 3 sheets, scale

	1:125,000.

Questions or comments?

Facebook Twitter Google Email