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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.

Organ Mountains fault, southern section (Class A) No. 2052b

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 2052b, Organ Mountains fault, southern 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 north-trending major piedmont fault bounds the eastern margin of the Organ Mountains, although in most places the fault is within Quaternary piedmont-slope deposits. This fault is characterized by prominent, high scarps on middle to late Quaternary deposits and appears to be one of the most recently active faults in this part of the Rio Grande rift. Detailed studies of soils on alluvial-fan deposits that are offset by the fault yielded information on slip rates and the most recent time of movement. A single deep trench across the fault failed to yield conclusive paleoseismic information owing to lack of penetration of fault

	colluvium on the downdropped block. **Sections:** This fault has 2 sections. It is divided into two sections on the basis of apparent differences in recency of movement and geomorphic expression. The southern 6.5 km of the fault [2052b] appears to be older and has a substantially lower slip rate than the Cox Ranch section [2052a].
Name comments	**General:** Seager (1981 #968) first applied the name Organ Mountains to this fault, although Reiche (1938 #972) appears to have been the first to describe the feature and to note its youthfulness. However, Reiche (1938 #972) only recognized about 6 km of the fault south of the Cox Ranch headquarters. Gile referred to this part of the fault as the Cox Ranch segment, although segment was used in a geometric rather than seismologic sense. As defined here, the Organ Mountains fault extends from a prominent counter-clockwise bend in the fault just south of U.S Highway 70 and Antelope Hill to its intersection with the Artillery Range fault [2051] on the southeast margin of the Organ Mountains. Seager (1981 #968) extended the fault north of U.S Highway 70 to the latitude of Bear Mountain, but his northern limit was not defined by structural or paleoseismic information. Therefore, the name and limits of the fault are herein restricted to correspond with its namesake, the Organ Mountains. **Section:** This term is applied to the unnamed southern 6.5 km of the fault, which has less pronounced scarps than the northern section. **Fault ID:** Referred to as fault 4 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:* Location based on 1:31,250-scale mapping of Seager (1981 #968), which was later compiled at 1:125,000 scale (Seager and others, 1987 #627) The location of the fault was digitized at 1:24,000 scale using photogrammetry to accurately map its trace from Seager and others (1987 #627).

Geologic setting	The fault is part of a longer system that extends from the latitude of Capital Peak in the northern White Sands Proving Grounds south to Juarez, Mexico. It joins the latest Pleistocene-age San Andres Mountains fault [2053] on the north and the late Pleistocene age Artillery Range fault [2051] on the south. The trace of the Organ Mountains fault is entirely within Quaternary deposits, although Precambrian bedrock of the Organ Mountains is generally either in close proximity to the fault or at shallow depth on the upthrown fault block.
Length (km)	This section is 7 km of a total fault length of 25 km.
Average strike	N3°E (for section) versus N3°W (for whole fault)
Sense of movement	Normal *Comments:* Inferred from drilling and gravity measurements in the Tularosa Basin. Seager (1981) estimated there may be as much as 4–5 km of throw across the Organ Mountains fault and similar buried faults on the west side of the Tularosa Basin. However, along this section Tertiary bedrock is exposed between this fault and the Artillery Range fault [2051a] to the east at an intermediate structural position, suggesting significantly less throw than to the north.
Dip Direction	E *Comments:* Suggested as high-angle dipping normal fault by association with other Quaternary faults in this long system.
Paleoseismology studies	
Geomorphic expression	Seager (1981 #968) showed the entire trace of this section as concealed, thus the fault has no direct surficial expression. For most of its length, the obvious geomorphic escarpment is probably a fault-line scarp that represents some to considerable retreat from the fault's subsurface position.
Age of faulted surficial deposits	The fault is mapped as concealed beneath the surface of the piedmont-facies of the Camp Rice Formation (Seager, 1981 #968). This surface is generally considered to be of early to middle Pleistocene age (Mack and others, 1993 #1020). Considering the youthful morphology of the Cox Ranch section

	[2052a] and Artillery Range fault [2051a], it seems likely that this part of the fault was active in the Quaternary.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Quaternary movement is inferred based on its spatial association with the Cox Ranch section [2052a] and Artillery Range fault [2051a]. However, it is possible that the fault was either not active in the Quaternary or does not extend south beyond the Cox Ranch section [2052a].
Recurrence interval	*Comments:* Mapping indicates that there has been no significant faulting in many hundreds of thousands of years.
Slip-rate category	Less than 0.2 mm/yr *Comments:* Lack of late Pleistocene faulting (<130 ka) implies a low slip rate.
Date and Compiler(s)	2015 Michael N. Machette, U.S. Geological Survey, Retired Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#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. #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. #972 Reiche, P., 1938, Recent fault scarps, Organ Mountain District, New Mexico: American Journal of Science, v. 36, no. 216, p. 440–444. #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.