

# 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](#).

## unnamed faults near Albuquerque Volcanoes (Class A) No. 2049

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

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#### Synopsis

Several unnamed north-trending normal faults are located near the Albuquerque Volcanoes. The basaltic volcanic field associated with the volcanoes is apparently confined in a broad graben, defined on the west by the down-to-the-east County Dump fault [2038] and on the east by the down-to-the-west East Paradise fault zone [2040]. Between these two flanking faults there is a series of smaller fault blocks and grabens. Most of these faults appear to be buried by basalt flows dated at about 155 ka. However, these faults can be mapped beneath the flows because most are marked by linear breaks in slope, indicating that

	<p>preexisting fault scarps disrupted the flows during emplacement. The extent of some buried faults are also evident in high resolution aeromagnetic data. At least two faults are marked by more pronounced linear scarps that indicate small (1–2 m) post-basalt (155–218 ka) movements: a short down-to-the-east fault located between the East [2040] and West Paradise [2042] fault zones clearly offsets basalt in two places along the eastern edge of the volcanic field, and a longer north-trending down-to-the-west fault marked by small scarps in basalt bisects the volcanic field west of the West Paradise fault. This fault may have been the source of the 1978–1979 earthquake swarm near the Albuquerque Volcanoes. Latest movements on both the County Dump [2038] and East Paradise [2040] faults also post-date basalt emplacement.</p>
<p><b>Name comments</b></p>	<p>This group of structures is a series of north-trending normal faults on the east side of the Albuquerque Volcanoes. Some of these faults are included in the West Mesa fault zone of Wong and others (1995 #1155) and Hawley and Whitworth (1996 #1303).</p>
<p><b>County(s) and State(s)</b></p>	<p>SANDOVAL COUNTY, NEW MEXICO BERNALILLO COUNTY, NEW MEXICO</p>
<p><b>Physiographic province(s)</b></p>	<p>BASIN AND RANGE</p>
<p><b>Reliability of location</b></p>	<p>Good Compiled at 1:24,000 scale.</p> <p><i>Comments:</i> Fault traces from 1:24,000-scale maps of Connell and others (1998 #7490), Shroba and others (2003 #7459), and Thompson and others (2009 #7460). The locations of some traces beneath the volcanic field are based on high-resolution aeromagnetic data (U.S. Geological Survey and SIAL Geosciences Inc., 1997 #1722; Grauch and Millegan, 1998 #1721).</p>
<p><b>Geologic setting</b></p>	<p>These structures are intrabasin faults in the central part of the Albuquerque-Belen basin of the Rio Grande rift. The broad graben that confines the Albuquerque Volcanoes volcanic field suggests that movement on some faults may be associated with magmatic activity. Recent seismicity may be associated with one of these intrabasin structures. An earthquake swarm in 1978–1979 near the southwestern margin of the volcanic field yielded a composite fault-plane solution with a preferred nodal plane</p>

	striking N. 5° E. and dipping 74° W. (Jaksha and others, 1981 #1760). This fault plane projects to the surface very near the surface trace of an unnamed, 20 km long fault that lies 0.5 km east of the Albuquerque Volcanoes cinder cones. Northeast of the cinder cones, this fault is marked by small scarps on basalt that indicate post-basalt displacement. The County Dump fault [2038] is located between the surface trace of this fault and the surface projection of the earthquake 1978–1979 earthquake swarm, suggesting that the County Dump may sole into the fault at depth.
<b>Length (km)</b>	34 km.
<b>Average strike</b>	N5°W
<b>Sense of movement</b>	Normal
<b>Dip Direction</b>	E; W
<b>Paleoseismology studies</b>	
<b>Geomorphic expression</b>	Outside of the volcanic field, these faults are well expressed as eroded fault scarps on sediment of the upper Santa Fe Group and overlying surficial deposits. Within the Albuquerque Volcanoes volcanic field, these faults are marked by linear breaks in slope and minor fault scarps. Most breaks in slope along these faults appear to be preexisting scarps that disrupted the flow of basalt during eruptions to the west. At least two faults are marked by more pronounced linear scarps that indicate small post-basalt movements. Most of the fault traces in the volcanic field have been partly covered by eolian sand.
<b>Age of faulted surficial deposits</b>	At least two of these faults offset the basalt of the Albuquerque Volcanoes volcanic field; these rocks have been dated by several methods at about 155–218 ka (Geissman and others, 1990 #1297; Peate and others, 1996 #1411; Singer and others, 2008 #7492). Most of the faults cut sediment of the upper Santa Fe Group and surficial deposits that predate emplacement of the basalts.
<b>Historic earthquake</b>	
<b>Most recent prehistoric deformation</b>	middle and late Quaternary (<750 ka)  <i>Comments:</i> At least two faults in this group offset the 155–218-ka basalts of the Albuquerque Volcanoes volcanic field, indicating

	probable late Pleistocene displacement. Most of the other faults have most recent movements that predate 155–218 ka.
<b>Recurrence interval</b>	
<b>Slip-rate category</b>	Less than 0.2 mm/yr  <i>Comments:</i> Two of these structures offset the 155–218-ka basalts of the Albuquerque Volcanoes volcanic field by about 1–2 m, which suggests a low slip rate.
<b>Date and Compiler(s)</b>	2016 Stephen F. Personius, U.S. Geological Survey Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
<b>References</b>	#7490 Connell, S.D., Allen, B.D., Hawley, J.W., and Shroba, R.R., 1998, Geology of the Albuquerque West 7.5-minute quadrangle, Bernalillo County, New Mexico: New Mexico Bureau of Mines and Mineral Open-File Geologic Map 17, scale 1:24,000.  #1297 Geissman, J.W., Brown, L., Turrin, B.D., McFadden, L.D., and Harlan, S.S., 1990, Brunhes chron excursion/polarity episode recorded during the late Pleistocene, Albuquerque Volcanoes, New Mexico, USA: Geophysical Journal International, v. 102, p. 73-88.  #1721 Grauch, V.J.S., and Millegan, P.S., 1998, Mapping intrabasinal faults from high-resolution aeromagnetic data: The Leading Edge, v. 17, p. 53-55.  #1303 Hawley, J.W., and Whitworth, T.M., compilers, 1996, Hydrogeology of potential recharge areas for the basin- and valley-fill aquifer systems, and hydrogeochemical modeling of proposed artificial recharge of the upper Santa Fe aquifer, northern Albuquerque basin, New Mexico: New Mexico Bureau of Mines and Mineral Resources Open-File Report 402-D, 575 p.  #1760 Jaksha, L.H., Locke, J., and Gebhart, H.J., 1981, Microearthquakes near the Albuquerque volcanoes, New Mexico: Geological Society of America Bulletin, v. 92, p. 31-36.  #1411 Peate, D.W., Chen, J.H., Wasserburg, G.J., Papanastassiou, D.A., and Geissman, J.W., 1996, 238U-230Th dating of a

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