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Quaternary Fault and Fold Database of the United States

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Faults near Cochiti Pueblo (Class A) No. 2142

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

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Synopsis	Numerous north-northwest trending faults in the Santo Domingo basin near Cochiti Pueblo form a broad, low-relief accommodation zone between the east-tilted Albuquerque basin to the south and the west-tilted Española basin to the north. Most of these faults offset the Bandelier Tuff and thus have been active since the early Pleistocene. Younger movements may be demonstrated by convergence of middle to late Pleistocene terraces, but no fault scarps have been reported.
Name comments	This group of north-northwest trending normal faults is mapped near Cochiti Pueblo in the northwestern part of the Santo Domingo basin. Some of these faults are included in early

	compilations and regional mapping (Kelley, 1954 #1222; Smith and others, 1970 #1125; Kelley, 1977 #1106; Wong and others, 1995 #1155), but more recent 1:24,000-scale mapping in the region has better defined the structural geology in this area (Cather and Connell, 1998 #7435; Smith and Kuhle, 1998 #1770, #1771; Black and others, 2000 #74352; Dethier and others, 2011 #7436). From west to east, named faults in this area include: Borrego, Peralta, Camada, Sile, Domingo, and Cochiti faults (Smith and Kuhle, 1998 #1772).
County(s) and State(s)	SANDOVAL COUNTY, NEW MEXICO
Physiographic province(s)	BASIN AND RANGE SOUTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Fault traces are from 1:24,000-scale maps of Cather and Connell (1998 #7435), Smith and Kuhle (1998 #1770, #1771), Black and others (2000 #74352), and Dethier and others (2011 #74356).
Geologic setting	These faults are located in the northwestern part of the Santo Domingo basin of the Rio Grande rift. The Santo Domingo basin links the en echelon east-tiled Albuquerque basin to the south and west-tilted Española basin to the north; kinematic and paleostress evidence suggests that the basin functions as a relay that began to narrow in Plio-Pleistocene time (Minor and others, 2013 #7437). The faults thus form a broad, low-relief accommodation zone between the two basins (Cather, 1992 #1773; Smith and Kuhle, 1998 #1772). This interpretation differs from some interpretations that imply the presence of a discrete northeast-trending Santa Ana accommodation zone across this region (Chapin and Cather, 1994 #1180, fig. 2; May and Russell, 1994 #1775, fig. 3; Hawley and Whitworth, 1996 #1303, plate 2). The Santo Domingo basin has undergone seesaw subsidence since the late Miocene as indicated by stratigraphic relationships and patterns in terrace preservation (Smith and others, 2001 #74358). The Cochiti fault lies in an area of complex structural geology between the Pajarito [2008] and La Bajada [2032] faults. The Domingo fault may be a splay of the San Francisco fault [2031] (Smith and Kuhle, 1998 #1772).
Length (km)	32 km.

Average strike	N15°W
Sense of movement	Normal
Dip	60°–75° *Comments:* Most faults have surface dips of 60–75°, but the dips range from 47° to 86°. Fault dip data are from S.A. Minor (written commun., 1998).
Paleoseismology studies	
Geomorphic expression	Faults near Cochiti Pueblo are discontinuously exposed in Miocene to lower Pleistocene sediments of the Santa Fe Group, and in places offset the lower Pleistocene Bandelier Tuff (Smith and Kuhle, 1998 #1770, 1998 ,#1771); no fault scarps on surficial deposits have been reported.
Age of faulted surficial deposits	Most of these faults offset the lower Pleistocene Bandelier Tuff (Smith and Kuhle, 1998 #1770, #1771). Although these faults do not appear to offset middle Pleistocene terrace gravels, the downstream convergence of two terraces in Borrego Canyon suggests that the Borrego fault and/or its splays may have experienced slip after about 300 ka (Smith and others, 2001 #7438).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Most of these faults offset the Bandelier Tuff, and thus have been active since its deposition in the early Pleistocene. Younger movements may be demonstrated by convergence of middle Pleistocene terraces (Smith and others, 2001 #7438), but no fault scarps have been reported.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No slip rates have been published, but reported offsets of 50–200 m of the lower Pleistocene Bandelier Tuff (Smith and Kuhle, 1996 #1774; Smith and Kuhle, 1998 #1772) across some

	of these faults indicate low long-term slip rates.
Date and Compiler(s)	2016 Stephen F. Personius, U.S. Geological Survey Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
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