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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.

Faults of the southern Jemez Mountains (Class A) No. 2143

Last Review Date: 2016-06-24

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

citation for this record: **Jochems, A.P., compiler, 2016, Fault number 2143, Faults of the southern Jemez Mountains, 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 02:21 PM.**

Synopsis	This group of north-south trending faults displaces Tertiary volcanic rocks of the Keres Group as well as the early Pleistocene Bandelier Tuff south and southeast of the Valles caldera in the central Jemez Mountains. Some of the faults may be contiguous with faults near Cochiti Pueblo [2142] in the Santo Domingo subbasin of the Rio Grande rift.
Name comments	These faults include the Pines Canyon fault of Goff and others (2006 #7428) and the Aspen Ridge, Peralta Canyon, Upper San Juan Canyon, and San Juan Canyon faults of Goff and others

	(2006 #7427).
County(s) and State(s)	LOS ALAMOS COUNTY, NEW MEXICO SANDOVAL COUNTY, NEW MEXICO
Physiographic province(s)	SOUTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Fault traces from 1:24,000-scale maps of Lynch and others (2005 #7430), Goff and others (2006 #7427, 2006 #7428), and Kempter and others (2007 #7429).
Geologic setting	These faults are found south of the central core of the Jemez Mountains, which is formed by two calderas. Eruption of the older Toledo caldera created the Otowi member of the Bandelier Tuff (Smith and others, 1970 #1125) at about 1.6 Ma (Izett and Obradovich, 1994 #1305). Eruption of the younger Valles caldera created the Tshirege member of the Bandelier Tuff (Smith and others, 1970 #1125) at about 1.2–1.3 Ma (Izett and Obradovich, 1994 #1305; Phillips and others, 2007 #7431). To the south and southeast of the calderas lie high ridges, mesas, and deep canyons underlain by the Bandelier tuff as well as older volcanics of the Keres Group (Smith and others, 1970 #1125). These rocks are displaced by the faults, some of which may continue southward to faults near Cochiti Pueblo [2142] in the western part of the Santo Domingo subbasin of the Rio Grande rift.
Length (km)	17 km.
Average strike	N89°W
Sense of movement	Normal
Dip	E; W *Comments:* Goff and others (2006 #7427, 2006 #7428) reported dips of 70–75° for the Peralta Canyon fault zone in the Redondo Peak 7.5-minute quadrangle and 80° for an unnamed, east-dipping fault in the Bland 7.5-minute quadrangle.
Paleoseismology studies	

Geomorphic expression	These faults form discontinuous scarps of unknown height on Bandelier Tuff. Some north-south trending faults appear to control drainage courses. Elsewhere, the faults lack appreciable surface expression.
Age of faulted surficial deposits	Both the Otowi and Tshirege members of the Bandelier Tuff are displaced by these faults. The younger Tshirege member has been dated at about 1.2–1.3 Ma (Izett and Obradovich, 1994 #1305; Phillips and others, 2007 #7431). The Upper San Juan Canyon fault also cuts a gravel unit interbedded with the Tshirege member in the Redondo Peak 7.5-minute quadrangle (Goff and others, 2006 #7427).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* These faults displace the 1.2–1.6 Ma Tshirege and Otowi members of the Bandelier tuff. Additionally, Goff and others (2006 #7427) show the Upper San Juan Canyon fault as offsetting a gravel unit interbedded with the Tshirege member (1.2–1.3 Ma).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr
Date and Compiler(s)	2016 Andrew P. Jochems, New Mexico Bureau of Geology & Mineral Resources
References	#7427 Goff, F., Gardner, J.N., Reneau, S.L., and Goff, C.J., 2006, Geologic map of the Redondo Peak quadrangle, Sandoval County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 111, scale 1:24,000. #7428 Goff, F., Reneau, S.L., Lynch, S., Goff, C.J., Gardner, J.N., Drakos, P., and Katzman, D., 2006, Geologic map of the Bland quadrangle, Los Alamos and Sandoval Counties, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 112, scale 1:24,000. #1305 Izett, G.A., and Obradovich, J.D., 1994, $^{40}Ar/^{39}Ar$ age

constraints for the Jaramillo Normal Subchron and Matuyama-Brunhes geomagnetic boundary: Journal of Geophysical Research, v. 99, no. B2, p. 2925-2934.

#7429 Kempter, K., Osburn, G.R., Kelley, S., Rampey, M., Ferguson, C., and Gardner, J., 2007, Preliminary geologic map of the Bear Springs Peak quadrangle, Sandoval County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 74, scale 1:24,000.

#7430 Lynch, S.D., Smith, G.A., and Kuhle, A.J., 2005, Geologic map of the Cañada quadrangle, Sandoval County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Geologic Map 85, scale 1:24,000.

#7431 Phillips, E.H., Goff, F., Kyle, R., McIntosh, W.C., Dunbar, N.W., and Gardner, J.N., 2007, The $^{40}Ar/^{39}Ar$ age constraints on the duration of resurgence at the Valles caldera, New Mexico: Journal of Geophysical Research, v. 112, B08201.

#1125 Smith, R.L., Bailey, R.A., and Ross, C.S., 1970, Geologic map of the Jemez Mountains, New Mexico: U.S. Geological Survey Miscellaneous Investigations Map I-571, 1 sheet, scale 1:125,000.