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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.

Cannibal fault (Class A) No. 2337

Last Review Date: 1999-04-01

Compiled in cooperation with the Colorado Geological Survey

citation for this record: **Widmann, B.L., compiler, 1999, Fault number 2337, Cannibal fault, 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 03:00 PM.**

Synopsis	The Cannibal fault is in the San Juan Mountains between two major middle or late Cenozoic volcanic centers; the nested Lake City and Uncompahgre calderas to the west and the nested La Garita and San Luis calderas to the east (Steven and Hail, 1989 #2747). Although previously considered a late Cenozoic fault by Kirkham and Rogers (1981 #792) and Colman (1985 #1953), more recent investigation by Lettis and others (1996 #4453) indicated probable Quaternary fault movement on the Cannibal fault. They reported numerous lineations in late Pleistocene glacial deposits along the fault and a strong geomorphic expression in the Clear Creek graben. They concluded that the Cannibal fault is potentially active. Based on the work of Lettis and others (1996 #4453), the Cannibal fault is herein considered

	to have last moved during the late Quaternary.
Name comments	The Cannibal fault is in the San Juan Mountains, east of Lake City. It trends generally southeast from the mouth of Fourth of July Creek, near the Hinsdale/Gunnison County line, to Antelope Spring southeast of Santa Maria Lake. The fault was named by Lettis and others (1996 #4453). **Fault ID:** Fault 96 in Kirkham and Rogers (1981 #792).
County(s) and State(s)	HINSDALE COUNTY, COLORADO MINERAL COUNTY, COLORADO GUNNISON COUNTY, COLORADO
Physiographic province(s)	SOUTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* The north half of the Cannibal fault was mapped at a scale of 1:100,000 Steven and Hail (1989 #2747), 1:250,000 by Tweto and others (1976 #2774), 1:500,000 by Kirkham and Rogers (1981 #792), and 1:1,000,000 by Colman (1985 #1953). The south half of the fault was mapped at a scale of 1:250,000 by Steven and others (1974). The entire length of the fault was mapped at a scale of 1:250,000 by Lettis and others (1996 #4553) and 1:250,000 and 1:500,000 by Widmann and others (1998 #3441). The trace used herein is from Lettis and others (1996 #4553).
Geologic setting	The Cannibal fault is in the San Juan Mountains, an area characterized by extensive middle and late Tertiary volcanism. Steven and others (1974 #2748) outlined as many as 15 collapsed and nested calderas in the San Juan Mountains. Many of the faults in this area are related to collapse of these volcanic calderas. However, the Cannibal fault lies between two large volcanic centers; the nested Lake City and Uncompahgre calderas to the west and the nested La Garita and San Luis calderas to the east. It is a normal down-to-west fault and forms the northeast margin of the Clear Creek graben, south of Spring Creek Pass.
Length (km)	49 km.
Average strike	N20°W

Sense of movement	Normal *Comments:* Lettis and others (1996 #4453) suggested normal movement on a west-dipping fault plane.
Dip Direction	W
Paleoseismology studies	
Geomorphic expression	Lineaments in late Pleistocene glacial deposits along the fault were reported by Lettis and others (1996 #4453).
Age of faulted surficial deposits	Rocks of the Miocene Hinsdale Formation are offset by the northern end of this fault (Steven and Hail, 1989 #2747). Kirkham and Rogers (1981 #792) reported 100 m of offset in Miocene volcanic rocks, based on oral communication with T.A. Steven. Quaternary deposits were not mapped as offset by the fault by Steven and Hail (1989 #2747) or Steven and others (1974 #2748), but Lettis and others (1996 #4453) noted several lineaments in older Pinedale (late Pleistocene) to Bull Lake (late middle Pleistocene) moraine deposits.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* This fault has been active since the Miocene, based on offset of Miocene volcanic rocks (Kirkham and Rogers, 1981 #792; Steven and Hail, 1989 #2747). Lettis and others (1996 #4453) reported "topographic, lithologic, and vegetation lineaments suggestive of recent fault activity" in older Pinedale to Bull Lake (late Pleistocene) moraine deposits. They concluded that the Cannibal fault is a potentially active fault based on these lineaments and "its strong geomorphic expression within the Clear Creek graben..." The most recent paleoevent is herein tentatively considered to have occurred during the late Quaternary.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* The compiler placed this fault within the <0.2 mm/yr

	slip-rate category.
Date and Compiler(s)	1999 Beth L. Widmann, Colorado Geological Survey
References	#1953 Colman, S.M., 1985, Map showing tectonic features of late Cenozoic origin in Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations I-1566, 1 sheet, scale 1:1,000,000. #792 Kirkham, R.M., and Rogers, W.P., 1981, Earthquake potential in Colorado: Colorado Geological Survey Bulletin 43, 171 p., 3 pls. #4453 Lettis, W., Noller, J., Wong, I., Ake, J., Vetter, U., and LaForge, R., 1996, Draft report, Seismotectonic evaluation of Colorado River storage project-Crystal, Morrow Point, Blue Mesa dams, Smith Fork project-Crawford dam, west-central Colorado: Technical report to U.S. Bureau of Reclamation, Denver, Colorado, 177 p. #2747 Steven, T.A., and Hail, W.J., Jr., 1989, Geologic map of the Montrose 30' x 60' quadrangle, southwestern Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations I-1939. #2748 Steven, T.A., Lipman, P.W., Hail, W.J., Jr., Barker, F., and Luedke, R.G., 1974, Geologic map of the Durango quadrangle, southwestern Colorado: U.S. Geological Survey Miscellaneous Geologic Investigations I-764. #2774 Tweto, O., Steven, T.A., Hail, W.J., Jr., and Moench, R.H., 1976, Preliminary geologic map of the Montrose 1° x 2° quadrangle, southwestern Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-761. #3441 Widmann, B.L., Kirkham, R.M., and Rogers, W.P., 1998, Preliminary Quaternary fault and fold map and database of Colorado: Colorado Geological Survey Open-File Report 98-8, 331 p., 1 pl., scale 1:500,000.

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