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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.

Mosquito fault (Class A) No. 2303

Last Review Date: 1997-06-12

Compiled in cooperation with the Colorado Geological Survey

citation for this record: **Widmann, B.L., compiler, 1997, Fault number 2303, Mosquito 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 Mosquito fault is a range-front fault on the west flank of the Tenmile and Mosquito Ranges. Tweto and Sims (1963 #2773) suggested a possible Precambrian origin for the fault with major movement during the Laramide orogeny. Neogene activity is evinced by offset of the Miocene-Pliocene Dry Union Formation (Tweto and Case, 1972 #2769; Tweto and Reed, 1973 #2772; Tweto, 1974 #2764). Fault activity may have continued into the Quaternary with offset of possible late Pleistocene or glacial deposits (Kirkham and Rogers, 1981 #792).
Name comments	The north-trending Mosquito fault forms the west flank of the Tenmile and Mosquito Ranges and represents the southern extension of the Gore fault. The northern end of the fault is near

	Silverthorne. It extends south between Climax and Leadville, and then bends to the southwest where it truncates against faults that form the northeast margin of the upper Arakansas Valley. Unruh and others (1993 #2777) included the Mosquito fault in what they referred to as the Northeastern Bounday fault system [2309], which forms the northeastern margin of the upper Arkansas Valley basin. **Fault ID:** Fault 56 in Kirkham and Rogers (1981 #792), fault 182 in Witkind (1976 #2792), and fault number Q52 of Widman and others (1998 #3441).
County(s) and State(s)	SUMMIT COUNTY, COLORADO LAKE COUNTY, COLORADO PARK COUNTY, COLORADO
Physiographic province(s)	SOUTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* The Mosquito fault was mapped at a scale of 1:62,500 by Tweto (1973 #2762; 1974 #2764; 1974 #2765) and Tweto and Reed (1973 #2762) and at a scale of 1:250,000 by Tweto and others (1978 #2770). The trace used herein is from Tweto and others (1978 #2770).
Geologic setting	The Mosquito fault is a high-angle normal fault that is down to the west and northwest. It is a range-front fault that forms the west margin of the Tenmile and Mosquito Ranges. Wallace and others (1968 #2783) indicated 458 m of left-lateral slip and 2,745 m of post-Oligocene normal displacement, based on offset of the Ceresco ore body at Climax. The fault extends north from the upper Arkansas Valley and is part of the Cenozoic Rio Grande rift (Tweto, 1979 #2767).
Length (km)	62 km.
Average strike	N14°E
Sense of movement	Normal *Comments:* Wallace and others (1968 #2783) indicated 458 m of left-lateral slip and 2,745 m of normal displacement.

Dip	70° W *Comments:* According to Wallace and others (1968 #2783) the fault dips 70? W near the town of Climax. The location of the measurment was not reported.
Paleoseismology studies	
Geomorphic expression	The Mosquito fault is a range-front fault with several distinctive scarps as much as 12 m high on glacial moraine and landslide deposits (Kirkham and Rogers, 1981 #792).
Age of faulted surficial deposits	Tweto and Case (1972 #2769), Tweto and Reed (1973 #2772) and Tweto (1974 #2764) showed the Miocene-Pliocene Dry Union Formation as offset by the fault. Kirkham and Rogers (1981 #792) indicated offset of glacial moraine and landslide deposits of Wisconsinan (late Quaternary) age, but stated that Holocene deposits are not offset by the fault. The fault primarily displaces Precambrian bedrock against Tertiary intrusive and sedimentary deposits and Pennsylvanian-Permian bedrock. Only about 10 percent of the fault lies in or beneath Quaternary deposits.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Tweto (1973 #2762; 1974 #2764; 1974 #2765) and Tweto and Reed (1973 #2772) did not show offset of Quaternary deposits. Witkind (1976 #2792) designated the fault as late Quaternary based on an oral communication with Ogden Tweto. Kirkham and Rogers (1981 #792) indicated offset of Wisconsinan (10-130 ka) deposits and stated that Holocene deposits are unfaulted. Colman (1985 #1953) assigned the fault to the late Pleistocene. Latest movement on the fault is herein considered to have occurred during the late Quaternary.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Widmann and others (1998 #3441) placed this fault in the <0.2 mm/yr slip-rate category based on Kirkham and Rogers (1981 #792) report of fault scarps as much as12 m high on

	Wisconsinan deposits (10-130 ka).
Date and Compiler(s)	1997 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. #312 Howard, K.A., Aaron, J.M., Brabb, E.E., Brock, M.R., Gower, H.D., Hunt, S.J., Milton, D.J., Muehlberger, W.R., Nakata, J.K., Plafker, G., Prowell, D.C., Wallace, R.E., and Witkind, I.J., 1978, Preliminary map of young faults in the United States as a guide to possible fault activity: U.S. Geological Survey Miscellaneous Field Studies Map MF-916, 2 sheets, scale 1:5,000,000. #792 Kirkham, R.M., and Rogers, W.P., 1981, Earthquake potential in Colorado: Colorado Geological Survey Bulletin 43, 171 p., 3 pls. #2762 Tweto, O., 1973, Reconnaissance geologic map of the Dillon 15-minute quadrangle, Summit, Eagle, and Grand Counties, Colorado: U.S. Geological Survey Open-File Report. #2764 Tweto, O., 1974, Geologic map of the Mount Lincoln 15-minute quadrangle, Eagle, Lake, Park, and Summit Counties, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-556. #2765 Tweto, O., 1974, Reconnaissance geologic map of the Fairplay West, Mount Sherman, South Peak, and Jones Hill 7 1/2-minute quadrangles, Park, Lake, and Chaffee Counties, Colorado: U.S. Geological Survey Miscellaneous Field Studies Map MF-555. #2767 Tweto, O., 1979, The Rio Grande Rift system in Colorado, *in* Rio Grande Rift—Tectonics and magmatism: American Geophysical Union, p. 33-56. #2769 Tweto, O., and Case, J.E., 1972, Gravity and magnetic features as related to geology in the Leadville 30-minute quadrangle, Colorado: U.S. Geological Survey Professional Paper 726-C, 31 p.

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