Jump to Navigation

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.

Roubideau Creek fault (Class A) No. 2270

Last Review Date: 2010-07-09

Compiled in cooperation with the Colorado Geological Survey

citation for this record: **Widmann, B.L., and Haller, K.M., compilers, 2010, Fault number 2270, Roubideau Creek 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 03:02 PM.**

Synopsis	The Roubideau Creek fault is on the east flank of the Uncompahgre Uplift. It is marked by a northeast facing 80-m-high scarp, a smaller southwest-facing scarp, and a sag pond (Lettis and others, 1996 #4453). The fault dips northeast (Lettis and others, 1996 #4453), but the sense of movement is not well understood. Late Pleistocene to Holocene landslide deposits are offset by the fault near Roubideau Creek (Kirkham and Rogers, 1981 #792; Lettis and others, 1996 #4453).
Name comments	The Roubideau Creek fault is a west-northwest-trending fault southwest of Delta, Colorado. The fault extends from near Traver Creek on the west nearly to the East Fork of Dry Creek on the

	east. Roubideau Creek is the dominant drainage between these two creeks. Lettis and others (1996 #4453) referred to this fault as the Roubideau Creek fault. **Fault ID:** Fault 82 in Kirkham and Rogers (1981 #792) and fault number Q20 of Widman and others (1998 #3441).
County(s) and State(s)	MONTROSE COUNTY, COLORADO
Physiographic province(s)	COLORADO PLATEAUS
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* The fault was mapped at a scale of 1:250,000 by Williams (1964 #2789) and Lettis and others (1996 #4453). The trace used herein is from Williams (1964 #2789).
Geologic setting	The Robideau Creek fault is a northeast-dipping normal fault (Lettis and others, 1996 #4453). Quaternary offset, however, Kirkham and Rogers (1981 #792) seem to suggests down-to-the-southwest movement on the fault,, implying reverse faulting at least during the Quaternary. The fault is part of a 55-km-long, 12- to 15-km-wide, northwest-trending zone of geomorphic features formed by repeated Quaternary fault displacements in the southeastern Uncompahgre Plateau that includes the Log Hill Mesa graben [2275] and the Busted Boiler fault [2274] (Piety and Ostenna, 2009 #7707).
Length (km)	20 km.
Average strike	N74°W
Sense of movement	Normal, Reverse *Comments:* Lettis and others (1996 #4453) defined the fault as northeast-dipping and normal, but Kirkham and Rogers (1981 #792) formerly suggested reactivation during the Quaternary in a reverse sense.
Dip Direction	NE *Comments:* Lettis and others (1996 #4453) defined the fault plane as northeast-dipping.

Paleoseismology studies	
Geomorphic expression	The Robideau Creek fault is marked by an 80-m-high northeast-facing scarp. The fault also aligns with another smaller scarp that is southwest-facing, and a sag pond is against this fault scarp. The smaller scarp and sag pond may be evidence of Quaternary activity on an antithetic fault in the hanging wall of the Robideau Creek fault (Lettis and others, 1996 #4453). Piety and Ostenaa (2009 #7707) suggest the height of individual fault scarps (1–5 m) seem to be anomalously high for the short (5–10 km) length of the individual faults; however, their height is consistent considering the 55-km length of the entire northwest-trending zone. McCalpin (2009) interprets an exposure of the Roubideau Creek "fault scarp" to suggest the features are the expression of a faulted monocline. Furthermore, most of the 60 m height of the escarpment can be attributed to plastic warping of Dakota sandstone down-to-the-north, with only 5-15 m of the height attributable to brittle normal faulting associated with the basal rejuvenated fault scarp and graben
Age of faulted surficial deposits	Quaternary landslide deposits of late Pleistocene to Holocene age are offset along the fault trace (Sullivan and others, 1980 #2756; Kirkham and Rogers, 1981 #792; Lettis and others, 1996 #4453). Williams (1964 #2789) shows no offset of Quaternary deposits. The majority of the fault extends through Jurassic and Cretaceous bedrock.
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Kirkham and Rogers (1981) designated the fault as Quaternary. Colman (1985 #1953) mapped the fault as an inferred Pleistocene fault. Sullivan and others (1980 #2756) and Lettis and others (1996 #4453) indicated late Pleistocene to Holocene movement on the fault based on offset of young landslide deposits.
Recurrence interval	*Comments:* Using arguments for average displacement per event and the age of the offset surfaces, McCalpin (2009 #7820)

	presents possible mean recurrence intervals of 6.25–8.75 k.y. and 16.7 k.y.; however as noted, these recurrence intervals are short for seismogenic faults in Colorado (McCalpin, 2009 #7820) and not likely representative of the behavior of the fault (fold).
Slip-rate category	Less than 0.2 mm/yr *Comments:* Lettis and others (1996 #4453) calculated a slip rate of <0.2 mm/yr based on a scarp height of 80 m and an age of about 500 ka or older.
Date and Compiler(s)	2010 Beth L. Widmann, Colorado Geological Survey Kathleen M. Haller, U.S. 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. #7820 McCalpin, J.P., 2009, Appendix A, Neotectonics of Quaternary faults Q20, Q22, Q23 in the central Uncompahgre Plateau, Colorado, *in* Piety, L.A., and Ostenaa, D.A., Characteristics of a northwest-trending zone of Quaternary tectonic features, southeastern Uncompahgre Plateau, southwestern Colorado: Bureau of Reclamation Seismotectonic Report No. 2009-5. #7271 Piety, L.A., and Ostenaa, D.A., 2009, Trenching studies on the southern Busted Boiler fault zone, southeastern Uncompahgre Plateau, southwestern Colorado: U.S. Bureau of Reclamation Seismotectonic Report No. 2009-04, 294 p. #7707 Piety, L.A., and Ostenaa, D.A., 2009, Characteristics of a northwest-trending zone of Quaternary tectonic features,

	southeastern Uncompahgre Plateau, southwestern Colorado: U.S. Bureau of Reclamation Seismotectonic Report No. 2009-5, 146 p. #2756 Sullivan, J.T., Meeder, C.A., Martin, R.A., and West, M.W., 1980, Seismic hazard evaluation-Ridgway dam and reservoir site-Dallas Creek project Colorado: U.S. Water and Power Resources Service, Seismotectonic Section, report, 43 p. #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. #2789 Williams, P.L., 1964, Geology, structure, and uranium deposits of the Moab quadrangle, Colorado and Utah: U.S. Geological Survey Miscellaneous Geologic Investigations I-360.