

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](#).

Granite Creek fault zone (Class A) No. 2265

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Compiled in cooperation with the Utah
Geological Survey and the Colorado Geological
Survey

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Synopsis

This fault lies on the southwest margin of the Uncompahgre Uplift near the Colorado/Utah border. Williams (1964 #2789) mapped Quaternary deposits as both concealing the fault and as abutting the fault. Based on the timing of abandonment of Unaweep Canyon by the Gunnison River, Cater (1966 #2671) indicated uplift of the Uncompahgre Plateau began in the mid-Pliocene and continued into the Pleistocene, resulting in as much as 640 m of differential uplift. Despite the lack of evidence of faulted Quaternary deposits along the Granite Creek fault zone, it has been classified as a Quaternary fault (e.g., Kirkham and

	Rogers, 1981 #792; Colman, 1985 #1953), and no references have been published that refute this age assignment.
Name comments	<p>This northwest-trending fault extends from Utah into Colorado north of Steamboat Mesa, on the southwest flank of the Uncompahgre Uplift. The majority of the fault is in Utah. The Granite Creek fault zone forms part of the southwest margin of the Ute Creek graben. The fault was named by Heyman (1983 #2697) after Granite Creek, which flows through eastern Utah and crosses the west end of the fault in Utah. Uncompahgre fault zone</p> <p>Fault ID: Fault 78 in Kirkham and Rogers (1981 #792); fault number Q15 of Widman and others (1998 #3441); and part of fault number 18-3 in Hecker (1993 #642).</p>
County(s) and State(s)	GRAND COUNTY, UTAH MESA COUNTY, COLORADO
Physiographic province(s)	COLORADO PLATEAUS
Reliability of location	<p>Good Compiled at 1:250,000 scale.</p> <p><i>Comments:</i> The fault was mapped by Williams (1964 #2789) at 1:250,000 and mapped or discussed by Cater (1970 #2671), Heyman (1983 #2697), and Ely and others (1986 #2687).</p>
Geologic setting	This fault is on the southwest margin of the Uncompahgre Uplift along the Utah/Colorado border near Steamboat Mesa. The Uncompahgre Uplift is a northwest-trending, east-tilted fault block. This fault is high-angle normal and down to the northeast. Throw on the fault is opposite to local topography. The fault lies in a tectonically weakened area above the ancestral Uncompahgre fault zone (Stone, 1977 #2749).
Length (km)	23 km.
Average strike	N59°W
Sense of movement	<p>Normal</p> <p><i>Comments:</i> Heyman (1983 #2697) and Kirkham and Rogers (1981 #792) showed this fault as normal.</p>
Dip	60° NE

	<p><i>Comments:</i> Heyman (1983 #2697) measured a dip of 60° on a northeast-dipping fault plane. The measurement was taken in the general vicinity of T.14S., R.104W. (Colorado).</p>
Paleoseismology studies	
Geomorphic expression	Geomorphic indicators of youthful faulting have not been reported.
Age of faulted surficial deposits	Williams (1964 #2789) mapped Quaternary deposits as both concealing the fault and as abutting the fault. The Jurassic Summerville Formation is the youngest deposit that is clearly offset by the fault. The fault lies primarily in Jurassic and Triassic bedrock with about 15 percent of the fault extending adjacent to or beneath Quaternary deposits.
Historic earthquake	
Most recent prehistoric deformation	<p>undifferentiated Quaternary (<1.6 Ma)</p> <p><i>Comments:</i> Offset of Quaternary deposits is inconclusive since Williams (1964 #2789) showed Quaternary deposits as abutting against the fault and concealing the fault. However, faults associated with the Uncompahgre Uplift are often considered to have experienced Quaternary movement. Based on the timing of abandonment of Unaweep Canyon, Cater (1966 #2671) indicated uplift of the Uncompahgre Plateau began in the mid-Pliocene and continued into the Pleistocene, resulting in as much as 640 m of differential uplift. There is no other published evidence that Quaternary deposits are offset by this structure. Despite the lack of evidence for Quaternary movement, this fault has been classified as a Quaternary fault (e.g., Kirkham and Rogers, 1981 #792; Colman, 1985 #1953), and no references have been published that refute this age assignment.</p>
Recurrence interval	
Slip-rate category	<p>Less than 0.2 mm/yr</p> <p><i>Comments:</i> Based on calculations of an overall uplift rate of 0.4 mm/yr since 1.8 Ma for the Uncompahgre Uplift (Perry, 1989 #2731; Perry and Annis, 1990 #4458), a geologic slip rate of less</p>

than 0.2 mm/yr is estimated for this fault (Widmann and others, 1998 #3441).

**Date and
Compiler(s)**

1997
Beth L. Widmann, Colorado Geological Survey

References

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#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.

#2687 Ely, R.W., Wong, I.G., and Chang, P., 1986, Neotectonics of the Uncompahgre Uplift, eastern Utah and western Colorado, *in* Rogers, W.P., and Kirkham, R.M., eds., Contributions to Colorado tectonics and seismicity—A 1986 update: Colorado Geological Survey Special Publication 28, p. 75-92.

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#792 Kirkham, R.M., and Rogers, W.P., 1981, Earthquake potential in Colorado: Colorado Geological Survey Bulletin 43, 171 p., 3 pls.

#4458 Perry, T.W., and Annis, D.R., 1990, Pleistocene history of the Gunnison River in UnawEEP Canyon, Colorado, and implications for Colorado Plateau uplift: Geological Society of America Abstracts with Programs, v. 22, no. 3, p. 75.

#2731 Perry, T.W.V., 1989, Tectonic inference and computer simulation in stream longitudinal profile evolution, UnawEEP Canyon and vicinity, Colorado and Utah: Geological Society of America Abstracts with Programs, v. 21, no. 6, p. 269.

#2749 Stone, D.S., 1977, Tectonic history of the Uncompahgre Uplift, *in* Veal, H.K., ed., Exploration Frontiers of the central and southern Rockies: Rocky Mountain Association of Geologists, 1977 Field Conference Guidebook, p. 23-30.

#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.

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