

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](#).

Boulder River valley western border fault (Class A) No. 676

Last Review Date: 1993-04-20

Compiled in cooperation with the Montana Bureau of Mines and Geology

citation for this record: Machette, M.N., compiler, 1993, Fault number 676, Boulder River valley western border 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 02:04 PM.

Synopsis	Poorly studied range-bounding fault on eastern side of an unnamed range south of Bull Mountain and west of the Boulder River. The medial part of the fault has Quaternary scarps (Stickney and Bartholomew, written commun. 1992 #556), whereas the extent and location of the distal portions are inferred based on local topography.
Name comments	Johns and others (1982 #259) is the source of the name, although, the fault is on the piedmont of the Bull Mountain, rather than along the Boulder River. Stickney and Bartholomew (written

	<p>commun. 1992 #556) used the name Bull Mountain fault for its location along an unnamed range that is south of Bull Mountain. Fault extends from 2.5 km southeast of Boulder Hot Springs southward to 1.5 km north of U.S. Highway 10 near the Jefferson River.</p> <p>Fault ID: Refers to fault 26 (Boulder River valley western border fault) of Johns and others (1982 #259).</p>
County(s) and State(s)	JEFFERSON COUNTY, MONTANA
Physiographic province(s)	NORTHERN ROCKY MOUNTAINS
Reliability of location	<p>Poor Compiled at 1:250,000 scale.</p> <p><i>Comments:</i> In general, location is poor. Part of fault having Quaternary scarps is well located and is from digital compilation of Stickney and Bartholomew (written commun. 1992 #556). Remainder of fault was transferred from 1:500,000 scale map of Johns and others (1982 #259).</p>
Geologic setting	<p>High-angle, down-to-the-east, range-bounding normal fault on east flank of Bull Mountain and adjacent unnamed range, which form an elongate north-trending fault block. Although Johns and others (1982 #259) made no mention of actual fault scarps, they show a high confidence in the fault's existence and report a length of 32 km for the structure. Johns and others (1982 #259) argue that late Pleistocene faulting induced the incision and deposition of alluvial fans and inferred as much as 120 m of offset of the piedmont surface.</p>
Length (km)	33 km.
Average strike	N11°W
Sense of movement	<p>Normal</p> <p><i>Comments:</i> Johns and others (1982 #259).</p>

Dip	about 75° E <i>Comments:</i> Johns and others (1982 #259) provide this approximate dip but do not report its location or basis.
Paleoseismology studies	
Geomorphic expression	Stickney and Bartholomew (written commun. 1992 #556) mapped a 3- to 4-km-long fault scarp that crosses the alluvial piedmont southeast of Bull Mountain along the medial part of the fault from about Brady Creek southward to Dunn Creek. North and south of the medial part, no obvious fault scarps are preserved.
Age of faulted surficial deposits	
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) <i>Comments:</i> Stickney and Bartholomew (written commun. 1992 #556) showed the fault scarp as middle to late Quaternary on their unpublished digital map. This generally agrees with the late Pleistocene age inferred by Johns and others (1982 #259).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> Inferred low slip rate based on 120 m of offset in deposits that could be as old as middle Pleistocene (<750 ka).
Date and Compiler(s)	1993 Michael N. Machette, U.S. Geological Survey, Retired
References	#259 Johns, W.M., Straw, W.T., Bergantino, R.N., Dresser, H.W., Hendrix, T.E., McClernan, H.G., Palmquist, J.C., and Schmidt, C.J., 1982, Neotectonic features of southern Montana east of 112°30' west longitude: Montana Bureau of Mines and Geology Open-File Report 91, 79 p., 2 sheets. #556 Stickney, M.C., and Bartholomew, M.J., 1992 written commun., Preliminary map of late Quaternary faults in western

Montana (digital data): Montana Bureau of Mines and Geology
(digital version of MBMG Open-File Report 186), 1 pl., scale
1:500,000.

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