

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](#).

West Fork fault (Class A) No. 658

Last Review Date: 1993-01-12

Compiled in cooperation with the Montana Bureau of Mines and Geology

citation for this record: Haller, K.M., compiler, 1993, Fault number 658, West Fork 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 02:03 PM.

Synopsis	Even though the largest historic earthquake in Montana resulted in surface rupture of this short fault, little is known about its paleoseismic history. Only brief discussions are provided in reports dating from the early 1960s by Witkind.
Name comments	The earliest use of the name for this fault was probably by Witkind and others (1962 #633); however, in later publications, the common reference was to the West Fork fault scarps (Witkind, 1964 #247). Fault, as defined by 1959 surface rupture, parallels the northern part of Red Canyon fault [657] and is located about 1.5 km to northwest. Fault ID: Refers to number 44 (West Fork fault scarp) of Johns

	and others (1982 #259), number 15 (West Fork fault) of Stickney and Bartholomew (1987 #85), and West Fork fault of Stickney and Bartholomew (1987 #242; written commun. 1992 #556). Witkind (1975 #317) did not include this fault in his compilation.
County(s) and State(s)	GALLATIN COUNTY, MONTANA
Physiographic province(s)	NORTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:250,000 scale. <i>Comments:</i> Location based on 1:62,500-scale map (Witkind, 1964 #247; Myers and Hamilton, 1964 #250).
Geologic setting	High-angle, down-to-southwest, normal fault that is small and inconspicuous both structurally and topographically (Witkind and others, 1962 #633). Witkind and others (1964 #629) indicate that similar bedrock occurs on both sides of the fault for much of its length indicating that total stratigraphic throw is small.
Length (km)	3 km.
Average strike	N64°E
Sense of movement	Normal <i>Comments:</i> (Witkind, 1964 #247)
Dip Direction	SE <i>Comments:</i> Johns and others (1982 #259) indicate that fault is nearly vertical.
Paleoseismology studies	
Geomorphic expression	Fault is generally characterized by 0.9 m historical scarps with net displacements of 0.3-0.6 m (Witkind, 1964 #247).
Age of faulted surficial deposits	Unconsolidated sediments along its entire length (Witkind, 1964 #247); bedrock is near surface in at least some of the locations.
Historic	

Historic earthquake	Hebgen Lake earthquake 1959
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) <i>Comments:</i>
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> The poor topographic expression of this fault suggests low slip rates, and thus, the lowest slip-rate category is assigned here.
Date and Compiler(s)	1993 Kathleen M. Haller, U.S. Geological Survey
References	<p>#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.</p> <p>#250 Myers, W.B., and Hamilton, W., 1964, Deformation accompanying the Hebgen Lake earthquake of August 17, 1959, <i>in</i> The Hebgen Lake, Montana, earthquake of August 17, 1959: U.S. Geological Survey Professional Paper 435-I, p. 55-98.</p> <p>#242 Stickney, M.C., and Bartholomew, M.J., 1987, Preliminary map of late Quaternary faults in western Montana: Montana Bureau of Mines and Geology Open-File Report 186, 1 pl., scale 1:500,000.</p> <p>#85 Stickney, M.C., and Bartholomew, M.J., 1987, Seismicity and late Quaternary faulting of the northern Basin and Range province, Montana and Idaho: Bulletin of the Seismological Society of America, v. 77, p. 1602-1625.</p> <p>#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.</p>

#247 Witkind, I.J., 1964, Reactivated faults north of Hebgen Lake, *in* The Hebgen Lake, Montana, earthquake of August 17, 1959: U.S. Geological Survey Professional Paper 435-G, p. 37-50.

#317 Witkind, I.J., 1975, Preliminary map showing known and suspected active faults in western Montana: U.S. Geological Survey Open-File Report 75-285, 36 p. pamphlet, 1 sheet, scale 1:500,000.

#629 Witkind, I.J., Hadley, J.B., and Nelson, W.H., 1964, Pre-Tertiary stratigraphy and structure of the Hebgen Lake area, *in* The Hebgen Lake, Montana, earthquake of August 17, 1959: U.S. Geological Survey Professional Paper 435-R, p. 199-207.

#633 Witkind, I.J., Myers, W.B., Hadley, J.B., Hamilton, W., and Fraser, G.D., 1962, Geologic features of the earthquake at Hebgen Lake, Montana, August 17, 1959: Bulletin of the Seismological Society of America, v. 52, p. 163-180.

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