

# 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](#).

## Elk Creek fault (Class A) No. 694

Last Review Date: 1994-03-21

### Compiled in cooperation with the Montana Bureau of Mines and Geology

*citation for this record:* Haller, K.M., compiler, 1994, Fault number 694, Elk 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 02:02 PM.

<b>Synopsis</b>	Little is known about the Quaternary history of this fault; however, most agree this is a reactivated Laramide structure. Various authors have inferred Holocene or "Recent" movement but evidence of this is inconclusive.
<b>Name comments</b>	Source of the name s probably Andretta and Alsup (1960 #419). This fault is the western extension of Salesville fault (Hackett and others, 1960 #267; Carl, 1970 #689). Feichtinger (1970 #456) indicates that the Elk Creek fault may extend from the Cherry Creek fault southeastward to the mouth of Gallatin Canyon, but its extent as shown here is from about 8 km northwest of Madison River southeastward to near Goose Creek.

	<b>Fault ID:</b> Refers to number 84 (Elk Creek fault) of Johns and others (1982 #259).
<b>County(s) and State(s)</b>	GALLATIN COUNTY, MONTANA MADISON COUNTY, MONTANA
<b>Physiographic province(s)</b>	NORTHERN ROCKY MOUNTAINS
<b>Reliability of location</b>	Poor Compiled at 1:250,000 scale.  <i>Comments:</i> The trace of the fault west of the Madison River is well located based on 1:24,000-scale map of Feichtinger (1970 #456), but east of the river the trace is poorly located and modified to fit topography based on map of Carl (1970 #689).
<b>Geologic setting</b>	Cenozoic movement is normal, down to northeast on a steeply dipping preexisting structure demonstrating reverse (down-to-south) Laramide deformation and possibly similar style of deformation during Precambrian (Andretta and Alsup, 1960 #419; Feichtinger, 1970 #456). Amount of Quaternary throw not known due to complex history.
<b>Length (km)</b>	28 km.
<b>Average strike</b>	N62°W
<b>Sense of movement</b>	Normal  <i>Comments:</i> (Andretta and Alsup, 1960 #419)
<b>Dip Direction</b>	NE
<b>Paleoseismology studies</b>	
<b>Geomorphic expression</b>	West of the Madison River, a high, well-developed fluvial(?) surface (Madison bench) is displaced 60 m (Andretta and Alsup, 1960 #419). Expression of faulting east of the Madison River unknown.
<b>Age of faulted surficial deposits</b>	Quaternary gravels, colluvium; Tertiary eolian and lacustrine deposits (Feichtinger, 1970 #456).
<b>Historic</b>	

<b>earthquake</b>	
<b>Most recent prehistoric deformation</b>	undifferentiated Quaternary (<1.6 Ma)  <i>Comments:</i> Fault is thought to deform a high Quaternary fluvial terrace(?) as shown by Feichtinger (1970 #456); however, this gravel-capped surface is inferred to be Pliocene by Hackett and others (1960 #267). Feichtinger (1970 #456) suggests faulting may have occurred during the Holocene ("Recent"), but Stickney (oral commun. 1992) believes there is no evidence for late Quaternary surface faulting. Due to lack of consensus, a conservative estimate for the timing of the most recent event is used here.
<b>Recurrence interval</b>	
<b>Slip-rate category</b>	Less than 0.2 mm/yr  <i>Comments:</i> Inferred low slip rate is based on suggestion by Hackett and others (1960 #267) that Pliocene gravels are offset approximately 50 m.
<b>Date and Compiler(s)</b>	1994 Kathleen M. Haller, U.S. Geological Survey
<b>References</b>	#419 Andretta, D.B., and Alsup, S.A., 1960, Geology and Cenozoic history of the Norris-Elk Creek area, southwest Montana, <i>in</i> Campau, D.E., and Anisgard, H.W., eds., West Yellowstone—Earthquake area: Billings Geological Society, 11th Annual Field Conference, September 7-10, 1960, Guidebook, p. 185-190.  #689 Carl, J.D., 1970, Block faulting and development of drainage, northern Madison Mountains, Montana: Geological Society of America Bulletin, v. 81, p. 2287-2298.  #456 Feichtinger, S.H., 1970, Geology of a portion of the Norris quadrangle with emphasis on Tertiary sediments Madison and Gallatin Counties, Montana: Bozeman, Montana State University, unpublished M.S. thesis, 85 p., 2 pls.  #267 Hackett, O.M., Visher, F.N., McMurtrey, R.G., and Steinhilber, W.L., 1960, Geology and ground-water resources of the Gallatin Valley, Gallatin County, Montana: U.S. Geological Survey Water Supply Paper 1482, 282 p., 1 pl., scale 1:63,360.

#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.

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