

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](#).

Vendome fault (Class A) No. 668

Last Review Date: 1994-05-12

Compiled in cooperation with the Montana Bureau of Mines and Geology

citation for this record: Haller, K.M., compiler, 1994, Fault number 668, Vendome 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	Most of the fault has been studied only by preliminary reconnaissance. Little published evidence discusses the nature, timing, or extent of displacement. Two trenches have been excavated across the southern part of the fault.
Name comments	Name is from Bartholomew and Stickney (1987 #9). Fault, as shown, extends southward about 11 km from near Pipestone Hot Springs; however, the part of the fault north of Little Pipestone Creek may be suspect (M.C. Stickney, oral commun. 1992) because the scarp is low (1–2 m) and subdued (M.J. Bartholomew, written commun. 1996). Fault ID: Refers to number 8, Vendome horst, of Stickney and

	Bartholomew (1987 #85), Vendome horst of Stickney and Bartholomew (1987 #242), and Vendome fault of Stickney and Bartholomew (written commun. 1992 #556).
County(s) and State(s)	JEFFERSON COUNTY, MONTANA
Physiographic province(s)	NORTHERN ROCKY MOUNTAINS
Reliability of location	Poor Compiled at 1:250,000 scale. <i>Comments:</i> Trace of fault compiled from 1:500,000-scale map of Stickney and Bartholomew (1987 #242).
Geologic setting	Fault expressed as short, discontinuous intrabasin scarps, locally forming a horst, on western side of Jefferson basin. Total amount of structural displacement is unknown.
Length (km)	11 km.
Average strike	N13°W
Sense of movement	Normal <i>Comments:</i> (Stickney and Bartholomew, 1987 #242)
Dip Direction	E; W
Paleoseismology studies	Trench 668-1 was excavated in 1986 (Bartholomew and Stickney, 1987 #9) across the middle (down-to-the-east) scarp on the horst block at the southern end of the scarps (Bartholomew and others, 1990 #243) about 7 km west of Renova, Montana (1.6 km south of railroad). Downthrown block at this site is locally covered by Holocene alluvium, and scarp is about 4 m high. Three faulting events were recognized indicating 7 m of total displacement during the late Pleistocene (Bartholomew and others, 1990 #243). Displacement is documented to be 9 m by Bartholomew and Stickney (1987 #9). Two additional short trenches were excavated in 1990 about 0.5 km to the north of trench 668-1 (Stickney, written commun. 1993), but no published data are currently available.
Geomorphic expression	Scarps are generally 3–4 m high on alluvium and locally form a horst at the southern end of the scarps (Bartholomew and others,

	1990 #243).
Age of faulted surficial deposits	Scarps are on upper Quaternary (Bull Lake ?) deposits; Holocene and uppermost Pleistocene (Pinedale) deposits are not faulted. According to Bartholomew and others (1990 #243), scarps terminate at the contact between Bull Lake and Pinedale deposits.
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) <i>Comments:</i> The scarps on upper Quaternary deposits and their absence on uppermost Pleistocene and Holocene deposits indicate faulting occurred between about 13 and 150 k.y. ago (Stickney and Bartholomew, 1987 #85; Stickney and Bartholomew, 1987 #242; Stickney and Bartholomew, written commun. 1992 #556). Lenses of volcanic ash were found at different stratigraphic positions in the upper colluvial wedge, but Bartholomew and others (1990 #243) do not report the age of this ash to further constrain the timing of the most recent event.
Recurrence interval	<i>Comments:</i> Three faulting events between about 13 and 150 k.y. ago is indicated by trenching studies (Bartholomew and others, 1990 #243), but no constraining data are available for the timing of any of these events.
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> Approximately 7–9 m of offset (Bartholomew and Stickney, 1987 #9; Bartholomew and others, 1990 #243) since about 150 ka suggests a slip rate of much less than 0.2 mm/yr.
Date and Compiler(s)	1994 Kathleen M. Haller, U.S. Geological Survey
References	#9 Bartholomew, M.J., and Stickney, M.C., 1987, Late Quaternary faulting in southwestern Montana: Geological Society of America Abstracts with Programs, v. 19, p. 258-259. #243 Bartholomew, M.J., Stickney, M.C., and Wilde, E.M., 1990, Late Quaternary faults and seismicity in the Jefferson basin, <i>in</i> Hall, R.D., ed., Quaternary geology of the western Madison Range, Madison Valley, Tobacco Root range, and Jefferson

valley: Rocky Mountain Cell, Friends of the Pleistocene, August 15-19, 1990, Guidebook, p. 238-244.

#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.

#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.

#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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