

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](#).

Red Rock Hills fault, central section (Class A) No. 648b

Last Review Date: 1993-02-09

Compiled in cooperation with the Montana Bureau of Mines and Geology

citation for this record: Haller, K.M., compiler, 1993, Fault number 648b, Red Rock Hills fault, central section, 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

General: Most of this fault remains unstudied. Regalla and others (2006 #7033, 2007 #7032) mapped the northern part of the fault and summarized its characteristics. Johnson (1981 #30) discussed but did not map the fault, and Ostenaar and Wood (1990 #318) questioned some of Johnson's conclusions.

Sections: This fault has 3 sections. Sections are based on presumed age difference between northern section and other two sections, and the lack of continuous expression between southern two sections.

| | |
|---|---|
| <p>Name comments</p> | <p>General: An early reference to the Red Rock Hills fault is Scholten and others (1955 #69), who described the discontinuous fault as extending from near southern end of Clark Canyon Reservoir (north) to northeast of Lima, Montana (south). The northern part of fault described by Scholten is an older structure (Quaternary?) and is not coincident with the Monument Hill (Ostenaar and Wood, 1990 #318) section [648a] described in this compilation; Regalla and others (2006 #7033, 2007 #7032) refer to the northern part of the fault as the Monument Hill fault system. Discontinuous fault scarps shown here extends from Maurer Creek southeastward to Buck River.</p> <p>Section: This informally named section consists of two subparallel fault scarps north of Sage Creek.</p> |
| <p>County(s) and State(s)</p> | <p>BEAVERHEAD COUNTY, MONTANA</p> |
| <p>Physiographic province(s)</p> | <p>NORTHERN ROCKY MOUNTAINS</p> |
| <p>Reliability of location</p> | <p>Poor Compiled at 1:250,000 scale.</p> <p><i>Comments:</i> Location based on 1:200,000-scale mapping of Scholten and others (1955 #69).</p> |
| <p>Geologic setting</p> | <p>The fault is expressed as several widely separated, northwest-trending, down-to-the-southwest fault scarps that bound the southwest side of the Red Rock Hills. Johnson (1981 #30) considered it to be an antithetic fault to the Red Rock fault [641], which bounds the west side of Red Rock graben, and to have an equivalent amount of total throw of 1 km (Johnson, 1981 #313). In contrast, based on length-scaling relationships for normal faults, Regalla and others (2007 #7032) suggest that the total throw is about 400 m.</p> |
| <p>Length (km)</p> | <p>This section is 7 km of a total fault length of 38 km.</p> |
| <p>Average strike</p> | <p>N53°W (for section) versus N46°W,N36°W,N36°W (for whole fault)</p> |
| <p>Sense of movement</p> | <p>Normal</p> <p><i>Comments:</i> (Scholten and others, 1955 #69)</p> |

| | |
|--|--|
| Dip Direction | SW |
| Paleoseismology studies | |
| Geomorphic expression | Fault is defined by "linear swales at base of high angle slopes," triangular faces (dipping 18?-20?), and series of springs (Johnson, 1981 #313). |
| Age of faulted surficial deposits | |
| Historic earthquake | |
| Most recent prehistoric deformation | undifferentiated Quaternary (<1.6 Ma) <i>Comments:</i> Most recent event is suspected to be Quaternary; although no definitive estimate of age has been reported. |
| Recurrence interval | |
| Slip-rate category | Less than 0.2 mm/yr <i>Comments:</i> Inferred low slip rate based on lack of data to indicate late Quaternary slip. |
| Date and Compiler(s) | 1993 Kathleen M. Haller, U.S. Geological Survey |
| References | #30 Johnson, P.P., 1981, Geology of the Red Rock fault and adjacent Red Rock valley, Beaverhead County, Montana: Missoula, University of Montana, unpublished M.S. thesis, 88 p., 2 pls. #313 Johnson, P.P., 1981, Geology of the Red Rock fault and adjacent Red Rock valley, Beaverhead County, Montana, <i>in</i> Tucker, T.E., ed., Guidebook to southwest Montana: Montana Geological Society, 1981 Field Conference and Symposium, p. 245-251. #318 Ostenaar, D., and Wood, C., 1990, Seismotectonic study for Clark Canyon Dam, Pick-Sloan Missouri Basin Program, Montana: U.S. Bureau of Reclamation Seismotectonic Report 90-4, 78 p., 1 pl. |

#69 Scholten, R., Keenmon, K.A., and Kupsch, W.O., 1955,
Geology of the Lima region, southwestern Montana and adjacent
Idaho: Geological Society of America Bulletin, v. 66, p. 345-404.

[Questions or comments?](#)

[Facebook](#) [Twitter](#) [Google](#) [Email](#)

[Hazards](#)

[Design](#) [Ground Motions](#) [Seismic Hazard Maps & Site-Specific Data](#) [Faults](#) [Scenarios](#)

[Earthquakes](#) [Hazards](#) [Data](#) [Education](#) [Monitoring](#) [Research](#)

[Home](#) [About Us](#) [Contacts](#) [Legal](#)