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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.

Mud Creek fault (Class A) No. 626

Last Review Date: 2010-11-09

Compiled in cooperation with the Idaho Geological Survey

citation for this record: **Personius, S.F., and Adema, G.W., compilers, 2010, Fault number 626, Mud 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 03:03 PM.**

Synopsis	The Mud Creek fault is marked by a northwest-striking, 4.5-km-long, 2-km-wide zone of tonal and vegetation lineaments and subdued topographic scarps in Pinedale-equivalent outwash on the floor of Long Valley, a large north-trending graben system in western Idaho. The relationship of the Mud Creek fault to the much longer and more prominent Long Valley fault zone [628], which lies 3-5 km to the west, is unknown. Based on the age of the outwash deposits, the Mud Creek scarps are thought to have formed between the stabilization and dissection of the outwash plain in the latest Pleistocene or early Holocene, about 10 ka.
Name	The fault was mapped and informally named after nearby Mud

comments	Creek by Knudsen and others (1996 #5889).
County(s) and State(s)	VALLEY COUNTY, IDAHO
Physiographic province(s)	NORTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:50,000 scale. *Comments:* The fault traces are from 1:250,000-scale mapping of Knudsen and others (1996 #5889) further constrained by satellite imagery and topography at scale of 1:50,000. Reference satellite imagery is ESRI_Imagery_World_2D with a minimum viewing distance of 1 km (1000 m).
Geologic setting	The northwest-striking Mud Creek fault lies on the floor of Long Valley, a large north-trending graben system in western Idaho. The relationship of the Mud Creek fault to the much longer and more prominent Long Valley fault zone [628], which lies 3-5 km to the west, is unknown. The fault is not shown on any geologic maps of the area (Schmidt and Mackin, 1970 #512; Newcomb, 1970 #3761; Mitchell and Bennett, 1979 #5894; Fitzgerald, 1982 #5886) or on previous compilation of known or suspected active faults (Witkind, 1975 #320).
Length (km)	2 km.
Average strike	N50°W
Sense of movement	Normal *Comments:* The Mud Creek is mapped as a normal fault zone by Knudsen and others (1996 #5889).
Dip Direction	NE; SW
Paleoseismology studies	
Geomorphic expression	The Mud Creek fault is marked by a northwest-striking, 4.5-km-long, 2-km-wide zone of tonal and vegetation lineaments and subdued topographic scarps in Pinedale-equivalent outwash; the scarps also form narrow grabens that control the location of Holocene drainages (Knudsen and others, 1996 #5889).

Age of faulted surficial deposits	The Mud Creek fault is mapped by Knudsen and others (1996 #5889) in Pinedale-equivalent outwash deposits (Schmidt and Mackin, 1970 #512). In the McCall, Idaho, area, these sediments are thought to have been deposited 14-20 ka (Colman and Pierce, 1986 #5896).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* The Mud Creek fault is mapped by Knudsen and others (1996 #5889) in Pinedale-equivalent outwash deposits (Scmidt and Mackin, 1970 #512), but none of the mapped scarps cut Holocene alluvial deposits. Knudsen and others (1996 #5889) surmise that the scarps formed between the stabilization and dissection of the outwash plain in the latest Pleistocene or early Holocene, and assigned an age of about 10 ka for this faulting event. The fault is mapped as a lesser Holocene (<10 ka) structure by Breckenridge and others (2003 #5878).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* The only details about the size of scarps along the Mud Creek fault described by Knudsen and others (1996 #5889) are a single mention of an approximately 1-m-high scarp. If the rest of the mapped scarps are about the same size, then the inferred small amounts of offset indicate low rates of slip.
Date and Compiler(s)	2010 Stephen F. Personius, U.S. Geological Survey Guy W. Adema, Idaho Geological Survey
References	#5878 Breckenridge, R.M., Lewis, R.S., Adema, G.W., and Weisz, D.W., 2003, Miocene and younger faults in Idaho: Idaho Geological Survey Map 8, 1 sheet, scale 1:1,000,000. #5896 Colman, S.M., and Pierce, K.L., 1986, Glacial sequence near McCall, Idaho: Weathering rinds, soil development, morphology, and other relative-age criteria: Quaternary Research, v. 25, p. 25-42. #5886 Fitzgerald, J.E., 1982, Geology and basalt stratigraphy of the Weiser Embayment, west-central Idaho, *in* Bonnichsen, B.,

	and Breckenridge, R.M., eds., Cenozoic geology of Idaho: Idaho Bureau of Mines and Geology Bulletin 26, p. 103-128. #5889 Knudsen, K.L., Wong, I., Sawyer, T.L., Bott, J., Silva, W., and Lettis, W.R., 1996, Seismotectonic evaluation, Cascade Dam, Boise project, west-central Idaho: Final Report prepared for U.S. Department of the Interior, Bureau of Reclamation, 198 p., 3 pls. #5894 Mitchell, V.E., and Bennett, E.H., 1979, Geologic map of the Baker quadrangle, Idaho: Idaho Bureau of Mines and Geology Geologic Map Series, Baker 2° quadrangle, 1 sheet, scale 1:250,000. #3761 Newcomb, R.C., 1970, Tectonic structure of the main part of the basalt of the Columbia River Group Washington, Oregon, and Idaho: U.S. Geological Survey Miscellaneous Geologic Investigations I-587, 1 sheet, scale 1:500,000. #512 Schmidt, D.L., and Mackin, J.H., 1970, Quaternary geology of Long and Bear Valleys, west-central Idaho: U.S. Geological Survey Bulletin 1311-A, 22 p., 2 pls. #320 Witkind, I.J., 1975, Preliminary map showing known and suspected active faults in Idaho: U.S. Geological Survey Open-File Report 75-278, 71 p. pamphlet, 1 sheet, scale 1:500,000.