

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](#).

Cuddy Mountain fault (Class A) No. 634

Last Review Date: 2003-06-10

Compiled in cooperation with the Idaho Geological Survey

citation for this record: Personius, S.F., and McConnell, M.S., compilers, 2003, Fault number 634, Cuddy Mountain 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 Cuddy Mountain fault forms the western margin of the Cuddy Mountains in western Idaho, in a region of complex accreted Paleozoic-Mesozoic tectonostratigraphic terranes. The fault zone displaces Miocene Columbia River Basalt against Mesozoic sedimentary and metamorphic rocks primarily in a down-to-the-west sense of displacement. The fault zone originally may have formed as a Mesozoic thrust fault, and was later reactivated as a normal fault in the Cenozoic. The geomorphic expression of the Cuddy Mountain fault is the subject of some controversy. The fault is marked by vegetation lineations, saddles, and escarpments on bedrock, but no unequivocal evidence of Quaternary displacement has been documented.

Name comments	The fault defines the western margin of the Cuddy Mountains. The fault was originally named the Lick Creek fault by Fitzgerald (1982 #5886); the southern part was later renamed the Cuddy Mountain fault by Mann (1989 #3542). More recent reports (Zollweg and Wood, 1993 #780; Mann and Meyer, 1993 #3535; Knudsen and others, 1996 #5889) use the name Cuddy Mountain fault for the whole structure, so that name is retained herein.
County(s) and State(s)	WASHINGTON COUNTY, IDAHO ADAMS COUNTY, IDAHO
Physiographic province(s)	COLUMBIA PLATEAU NORTHERN ROCKY MOUNTAINS
Reliability of location	Good Compiled at 1:250,000 scale. <i>Comments:</i> The northern part of the fault is from 1:250,000-scale mapping of Fitzgerald (1982 #5886); the southern part of the fault is from 1:250,000-scale compilation of Geomatrix Consultants, Inc. (1989 #3546), based on 1:24,000-scale mapping of Mann (1989 #3542).
Geologic setting	The Cuddy Mountain fault zone forms the western margin of the Cuddy Mountains in western Idaho, in a region of complex accreted Paleozoic-Mesozoic tectonostratigraphic terranes (Mann, 1989 #3542). The fault zone displaces Miocene Columbia River Basalt against Mesozoic sedimentary metamorphic rocks primarily in a down-to-the-west sense of displacement (Fitzgerald, 1982 #5886; Mann, 1989 #3542). The fault zone originally may have formed as a Mesozoic thrust fault, and was later reactivated as a normal fault in the Cenozoic (Mann, 1989 #3542).
Length (km)	30 km.
Average strike	N40°E
Sense of movement	Normal <i>Comments:</i> The fault zone originally may have formed as a Mesozoic thrust fault (Mann, 1989 #3542), but is presently mapped as a normal fault (Fitzgerald, 1982 #5886; Mann, 1989 #3542). Mann and Meyer (1993 #3535) describe evidence of possible left-lateral offsets near the north end of the Cuddy

	Mountains.
Dip	65° NW <i>Comments:</i> Fault dip measurement in bedrock exposure from Mann (1989 #3542).
Paleoseismology studies	
Geomorphic expression	The geomorphic expression of the Cuddy Mountain fault is the subject of some controversy. Aerial reconnaissance of the fault indicated that the fault is marked by vegetation lineations, saddles, and probable tectonic scarps on Quaternary deposits (Geomatrix Consultants Inc., 1989 #3546). Mann (1989 #3542) conducted bedrock mapping in the region, and concluded that the fault was marked by abundant evidence of late Quaternary and possibly Holocene displacement. The potential hazard of the fault to large dams of the Snake River created a need for further review of Mann's evidence for Quaternary displacement, so a field review of potential geologic hazards to Brownlee Dam was organized in 1989. No report was published, but an extensive memorandum written by Anthony J. Crone and Robert L. Schuster (Crone and Schuster, June 23, 1989 #5893) summarized the findings of the field review. They found no evidence of Quaternary displacement along the Cuddy Mountain fault. In a later report, Zollweg and Wood (1993 #780) agreed that the fault is marked by a bedrock escarpment in places as much as 180 m high, but also found no unequivocal evidence of Quaternary displacement.
Age of faulted surficial deposits	The Cuddy Mountain fault offsets Miocene Columbia River basalts along most of its length (Fitzgerald, 1982 #5886; Mann, 1989 #3542), but no unequivocal evidence of displaced Quaternary deposits has been described (Zollweg and Wood, 1993 #780; Knudsen and others, 1996 #5889; Crone and Schuster, June 23, 1989 #5893).
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) <i>Comments:</i> The northern part of the fault is mapped as lesser Quaternary (<1.6 Ma) and the southern part as lesser late Quaternary (<130 ka) by Breckenridge and others (2003 #5878).

	The Cuddy Mountain fault is herein tentatively assigned a Quaternary age, but note the equivocal nature of evidence suggesting Quaternary displacement.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> Zollweg and Wood (1993 #780) used an offset of 610 m of Miocene Columbia River Basalt to determine an average minimum vertical slip rate of 0.04 mm/yr.
Date and Compiler(s)	2003 Stephen F. Personius, U.S. Geological Survey Michael S. McConnell, University of Idaho
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. #5893 Crone, A.J., and Schuster, R.L., 1989, Memorandum to Robert L. Wesson, Field review and assessment of earthquake and landslide hazards in the vicinity of Brownlee Dam, Snake River Canyon, Idaho and Oregon, June 23, 1989, p. 11. #5886 Fitzgerald, J.E., 1982, Geology and basalt stratigraphy of the Weiser Embayment, west-central Idaho, <i>in</i> Bonnicksen, B., and Breckenridge, R.M., eds., Cenozoic geology of Idaho: Idaho Bureau of Mines and Geology Bulletin 26, p. 103-128. #3546 Geomatrix Consultants, Inc., 1989, Seismotectonic evaluation of Mann Creek and Mason Dam sites: Technical report to U.S. Department of Interior, Bureau of Reclamation, Denver, under Contract 6-CS-81-07310, 118 p., 2 pls., scale 1:250,000. #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. #3542 Mann, G.M., 1989, Seismicity and late Cenozoic faulting in the Brownlee Dam Area—Oregon and Idaho: U.S. Geological Survey Open-File Report 89-429, 46 p., 4 pls., scale 1:24,000.

#3535 Mann, G.M., and Meyer, C.E., 1993, Late Cenozoic structure and correlations to seismicity along the Olympic-Wallowa Lineament, northwest United States: Geological Society of America Bulletin, v. 105, p. 853–871.

#780 Zollweg, J.E., and Wood, S.H., 1993, Faulting relationships, seismicity, design earthquakes, and peak ground accelerations at hydroelectric facilities in Hells Canyon of the Snake River, Idaho-Oregon: Report prepared for Idaho Power Company, 158 p., 3 pls.

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