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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.

Wallowa fault (Class A) No. 801

Last Review Date: 2016-03-21

citation for this record: **Personius, S.F., compiler, 2002, Fault number 801, Wallowa 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 03:16 PM.**

Synopsis	The Wallowa Mountains consist of a core of Jurassic and Triassic sedimentary an volcanic rocks that comprise an allocthonous island arc terrane, unconformably overlain by Miocene Columbia River basalts. The Wallowa fault forms a linear, s range front between the northeastern flank of the Wallowa Mountains and the upp Wallowa River valley, but no fault scarps offsetting Quaternary deposits have bee described along its trace. The most-recent surface-faulting event predates the approximately 140-ka age of Bull Lake-equivalent glacial moraines which lie unfaulted across the trace of the Wallowa fault.
Name comments	The geology of the Wallowa Mountains and Wallowa fault are summarized in Wa (1979 #3576). The fault has been the subject of numerous reconnaissance Quater fault investigations and compilations (Newcomb, 1970 #3761; Pezzopane and We 1993 #149; Zollweg and Wood, 1993 #780; Pezzopane, 1993 #3544; Simpson an others, 1993 #3596; Geomatrix Consultants Inc., 1995 #3593; Madin and Mabey, #3575; Wood, 1999 #4042; Weldon and others, 2002 #5648). The fault is apparer named after the Wallowa Mountains.

	Fault ID: This structure is fault number 14 of Pezzopane (1993 #3544) and fault number 65 of Geomatrix Consultants, Inc. (1995 #3593).
County(s) and State(s)	WALLOWA COUNTY, OREGON
Physiographic province(s)	COLUMBIA PLATEAU
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to 1:250,000-scale mapping of Walker (1979 #3576).
Geologic setting	The Wallowa Mountains consist of a core of Jurassic and Triassic sedimentary an volcanic rocks (Walker, 1979 #3576) that comprise an allocthonous island arc ter These rocks are unconformably overlain by Miocene Columbia River basalts. Th Wallowa fault forms a steep, linear range front in these rocks.
Length (km)	56 km.
Average strike	N51°W
Sense of movement	Normal, Right lateral *Comments:* Most studies show the Wallowa fault as a down-to-the-northeast norn fault. Mann and Meyer (1993 #3535) include the Wallowa fault in a regional scal right-lateral shear zone, the Olympic-Wallowa lineament, but they do not present evidence of lateral displacement on the Wallowa fault.
Dip	70° NE *Comments:* No actual dip measurements have been published, but Geomatrix Consultants, Inc. (1995 #3593) modeled the Wallowa fault as a 70° dipping norm fault in their analysis of paleo-earthquake magnitudes.
Paleoseismology studies	
Geomorphic expression	The Wallowa fault forms a linear, steep range front between the northeastern flan the Wallowa Mountains and the upper Wallowa River valley, but no fault scarps offsetting Quaternary deposits have been described along its trace (Pezzopane, 19 #3544; Simpson and others, 1993 #3596; Geomatrix Consultants Inc., 1995 #359

Age of faulted surficial deposits	The Wallowa fault offsets Miocene Columbia River basalts along most of its leng places, the fault is mapped as juxtaposing bedrock against Quaternary fanglomera (Walker, 1979 #3576; Walker and MacLeod, 1991 #3646), but despite offsets of r hundreds of meters of Miocene rocks, no evidence of offset Quaternary deposits h been described. These relations are especially evident at Wallowa Lake, where extensive glacial moraines lie unfaulted across the trace of the Wallowa fault (Hampton and Brown, 1964 #3491; Weis and others, 1976 #3490; Simpson and o 1993 #3596). Unfaulted moraines include those correlated to the Pinedale and Bu Lake Glaciations; the latter are thought to have formed about 140 ka in the Rocky Mountains (Crandell, 1967 #3785; Pierce and others, 1976 #3783; Forman and ot 1993 #3784).
Historic earthquake	
Most recent prehistoric deformation	middle and late Quaternary (<750 ka) *Comments:* The most recent event predates the age of Bull Lake-equivalent glaci moraines thought to have been deposited about 140 ka (Crandell, 1967 #3785; Pi and others, 1976 #3783; Simpson and others, 1993 #3596; Forman and others, 19 #3784). Pezzopane (1993 #3544) used airphoto analysis to determine possible mi or late Quaternary (<700 ka) displacement on the northern part of the Wallowa fa and more recent compilations follow suit (Geomatrix Consultants Inc., 1995 #35 Madin and Mabey, 1996 #3575; Weldon and others, 2002 #5648).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Zollweg and Wood (1993 #780) and Wood (1999 #4042) used a mini offset of 2200 m of Miocene Columbia River basalts to determine long-term aver rates of 0.14–0.16 mm/yr. The apparent lack of displacement in the last 140 ka suggests slower rates of late Quaternary slip.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
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