

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](#).

unnamed fault zone near Blue Mountain (Class A) No. 855

Last Review Date: 2002-11-27

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Synopsis	The unnamed fault zone near Blue Mountain is a north-northwest-trending, down-to-the-east normal fault zone that forms the steep eastern margin of Blue Mountain. The fault zone offsets Miocene volcanic rocks, and may be marked by intermittent, en echelon fault scarps in Quaternary deposits of unknown age. Latest movement on this fault is thought to have occurred in the early to middle Pleistocene.
Name comments	Parts of this fault zone were mapped by Walker and Repenning (1966 #3586), Walker (1991 #3646), Pezzopane (1993 #3544), Madin and others (1996 #3479), Narwold (2001 #3010), and Weldon and others (2002 #5648). This fault zone was included in the Owyhee River-Oregon Canyon zone or fault zone of Pezzopane (1993 #3544) and Pezzopane and Weldon (1993

	<p>#149), in the Santa Rosa-Owyhee River-Oregon Canyon fault zones of Geomatrix Consultants, Inc. (1995 #3593) and in the Quinn River Valley fault zone of the Santa Rosa Range fault system of Narwold and Pezzopane (1997 #3011) and Narwold (1999 #4035; 2001 #3010).</p> <p>Fault ID: This fault zone is included in fault number 50 of Pezzopane (1993 #3544) and fault number 63 of Geomatrix Consultants, Inc. (1995 #3593).</p>
County(s) and State(s)	MALHEUR COUNTY, OREGON
Physiographic province(s)	BASIN AND RANGE
Reliability of location	<p>Good Compiled at 1:100,000 scale.</p> <p><i>Comments:</i> Fault traces are from 1:48,000-scale mapping of Narwold (2001 #3010) and from 1:100,000-scale mapping of Weldon and others (2002 #5648), based on 1:500,000-scale mapping of Pezzopane (1993 #3544).</p>
Geologic setting	This fault is a north-northwest-trending, down-to-the-east normal fault zone that forms the eastern margin of Blue Mountain, an uplifted block of Miocene volcanic rocks (Walker and Repenning, 1966 #3586; Walker and MacLeod, 1991 #3646). The fault zone is located at the intersection between the northeast-trending Owyhee River section and the north-trending Quinn River section of the Santa Rosa fault system [1508].
Length (km)	9 km.
Average strike	N23°W
Sense of movement	<p>Normal, Right lateral</p> <p><i>Comments:</i> This fault zone is mapped as a zone of normal or high-angle faults by Walker and Repenning (1966 #3586), Walker (1991 #3646), Pezzopane (1993 #3544), and Narwold (2001 #3010). However, Narwold and Pezzopane (1997 #3011) report a possible component of dextral shear on faults included in their Quinn River Valley fault zone.</p>
Dip Direction	NE

Paleoseismology studies	
Geomorphic expression	The fault zone is marked by intermittent, en echelon fault scarps along the steep eastern flank of Blue Mountain (Pezzopane, 1999 #4039; Narwold, 2001 #3010). Weldon and others (2002 #5648) report that the fault has obvious geomorphic expression, but does not encounter Quaternary units.
Age of faulted surficial deposits	The fault along Blue Mountain offsets Miocene volcanic rocks correlative with the Steens Basalt (Walker and Repenning, 1966 #3586; Walker and MacLeod, 1991 #3646). "Young" fault scarps mark the trace of the fault (Pezzopane, 1999 #4039), but no descriptions of offset Quaternary deposits have been published.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) <i>Comments:</i> Pezzopane (1993 #3544) used airphoto analysis to infer Quaternary (<1.6 Ma) displacement, and Narwold (2001 #3010) used airphoto analysis and limited field reconnaissance to infer early to middle Pleistocene (0.13-1.5 Ma) displacement. Weldon and others (2002 #5648), Geomatrix Consultants, Inc. (1995 #3593), and Madin and others (1996 #3479) show the fault as active in the Quaternary (<1.6-1.8 Ma).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> No published slip data are available for the unnamed fault near Blue Mountain. However, Miocene volcanic rocks do not appear to be offset more than 300-400 m across the fault (Walker and Repenning, 1966 #3586; Walker and MacLeod, 1991 #3646); such data indicate low long-term rates of slip.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#1508 Ekren, E.B., Rogers, C.L., Anderson, R.E., and Orkild, P.P., 1968, Age of Basin and Range normal faults in Nevada Test Site and Nellis Air Force Range, Nevada, <i>in</i> Eckel, E.B., ed., Nevada Test Site: Geological Society of America Memoir 110, p. 247-250.

#3593 Geomatrix Consultants, Inc., 1995, Seismic design mapping, State of Oregon: Technical report to Oregon Department of Transportation, Salem, Oregon, under Contract 11688, January 1995, unpaginated, 5 pls., scale 1:1,250,000.

#3479 Madin, I.P., Ferns, M.F., Langridge, R., Jellinek, A.M., and Priebe, K., 1996, Final report to Bonneville Power Administration U.S. Department of Energy Portland General Electric Company—Geothermal resources of southeast Oregon: State of Oregon, Department of Geology and Mineral Industries Open-File Report OFR-0-96-4, 41 p., 6 pls.

#4035 Narwold, C.F., 1999, Late Quaternary faulting along the Quinn River fault zone—A soils investigation, *in* Quaternary geology of the northern Quinn River and Alvord Valleys, southeastern Oregon: Friends of the Pleistocene field trip guide, September 24-26, 1999, Appendix 1, p. 1–18.

#3010 Narwold, C.F., 2001, Late Quaternary soils and faulting along the Quinn River fault zone, northern Nevada, southeastern Oregon: Arcata, California, Humboldt State University, unpublished M.S. thesis, 76 p., 4, scale 1:48,000.

#3011 Narwold, C.F., and Pezzopane, S.K., 1997, Preliminary analysis of late Quaternary faulting along the Quinn River fault zone, northern Nevada-southeastern Oregon: Geological Society of America Abstracts with Programs, v. 29, no. 6, p. A-323.

#4039 Pezzopane, S., 1999, Regional tectonic setting and fault studies in Quinn River Valley and surrounding regions, Oregon and Nevada, *in* Quaternary geology of the northern Quinn River and Alvord Valleys, southeastern Oregon: Friends of the Pleistocene field trip guide, September 24-26, 1999, Appendix 6, p. 1-11.

#3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in Oregon: Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.

#149 Pezzopane, S.K., and Weldon, R.J., II, 1993, Tectonic role of active faulting in central Oregon: *Tectonics*, v. 12, p. 1140-1169.

#3646 Walker, G.W., and MacLeod, N.S., 1991, Geologic map of Oregon: U.S. Geological Survey, Special Geologic Map, 2 sheets, scale 1:500,000.

#3586 Walker, G.W., and Repenning, C.A., 1966, Reconnaissance geologic map of the west half of the Jordan Valley quadrangle Malheur County, Oregon: U.S. Geological Survey Miscellaneous Geologic Investigations I-457, 1 sheet, scale 1:250,000.

#5648 Weldon, R.J., Fletcher, D.K., Weldon, E.M., Scharer, K.M., and McCrory, P.A., 2002, An update of Quaternary faults of central and eastern Oregon: U.S. Geological Survey Open-File Report 02-301 (CD-ROM), 26 sheets, scale 1:100,000.

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