

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](#).

Upper Willamette River fault zone (Class B) No. 863

Last Review Date: 2016-05-06

citation for this record: Personius, S.F., compiler, 2002, Fault number 863, Upper Willamette River fault zone, 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	This northwest-striking fault zone marks the northwestern end of the Eugene-Denio zone on the western flank of the Cascade Range. The fault zone is marked by regional lineaments mostly expressed as linear stream valleys, but a few exposures of faults in bedrock have been described along these lineaments. No fault scarps on Quaternary deposits have been described, but one exposure of a fault in Pleistocene gravels and "discontinuities" in Quaternary volcanic rocks are possible evidence of Quaternary displacement. However, some investigators found no evidence of Quaternary displacement on these structures, so herein we classify these features as Class B until further studies are conducted.
Name	The Upper Willamette River fault zone was mapped by

comments	<p>Pezzopane (1993 #3544) and Pezzopane and Weldon (1993 #149) and named the Willamette or Upper Willamette River fault zone. Most geologic maps in the area do not show these structures (Woller and Black, 1983 #4057; Woller and Priest, 1983 #4056; Walker and MacLeod, 1991 #3646), although Sherrod (1991 #3568) maps a northwest-striking normal fault near the location of the southernmost fault mapped by Pezzopane (1993 #3544) near the Hills Creek Dam. These faults are included in the Upper Willamette River fault of Geomatrix Consultants, Inc. (1995 #3593). The three fault strands mapped by Pezzopane (1993 #3544) coincide with parts of three lineaments mapped by U.S. Army Corps of Engineers (1981 #3481), the Middle Fork Willamette River, Salt Creek, and Hills Creek lineaments. These faults and/or lineaments form the northwestern end of the Eugene-Denio zone, a northwest-striking zone of faults and lineaments that may have significant component of right-lateral strike slip (Lawrence, 1976 #3506).</p> <p>Fault ID: This fault zone is fault number 22 of Pezzopane (1993 #3544) and fault number 36 of Geomatrix Consultants, Inc. (1995 #3593).</p>
County(s) and State(s)	LANE COUNTY, OREGON
Physiographic province(s)	CASCADE-SIERRA MOUNTAINS
Reliability of location	<p>Poor Compiled at 1:500,000 scale.</p> <p><i>Comments:</i> Fault trace is from 1:500,000-scale mapping of Pezzopane (1993 #3544).</p>
Geologic setting	<p>These faults are mapped by Pezzopane (1993 #3544) in Tertiary and Quaternary volcanic and volcanoclastic rocks of the Cascade Range. Most geologic maps in the area do not show these structures (Woller and Black, 1983 #4057; Woller and Priest, 1983 #4056; Sherrod, 1991 #3568; Walker and MacLeod, 1991 #3646), although a down-north, northwest-striking fault mapped by Sherrod (1991 #3568) is located near the fault mapped by Pezzopane (1993 #3544) near the Hills Creek dam. U.S. Army Corps of Engineers (1981 #3481) also map faults in bedrock along their Middle Fork Willamette River, Salt Creek, and Hills Creek lineaments. All these faults or lineaments parallel the</p>

	regional northwest strike of dikes in the area.
Length (km)	44 km.
Average strike	N52°W
Sense of movement	<p>Right lateral, Normal</p> <p><i>Comments:</i> Sherrod (1991 #3568) mapped a fault near the Hills Creek dam as a high-angle fault, and U.S. Army Corps of Engineers (1981 #3481) map vertical faults with near-horizontal slickensides and minor right-lateral slip indicators in bedrock along their Middle Fork Willamette River, Salt Creek, and Hills Creek lineaments. Lawrence (1976 #3506) inferred right-lateral strike slip on faults included in his Eugene-Denio zone. Pezzopane (1993 #149; 1993 #3544) showed two of these structures as down-to-the-south high-angle faults, but included these faults in the right-slip Eugene-Denio zone.</p>
Dip	<p>82–90°</p> <p><i>Comments:</i> Dip measurements are from a fault mapped by Sherrod (1991 #3568) near the location of the fault at Hills Creek dam mapped by Pezzopane (1993 #3544), and from fault attitudes in bedrock from U.S. Army Corps of Engineers (1981 #3481).</p>
Paleoseismology studies	
Geomorphic expression	<p>Faults in this zone form regional-scale lineaments, mostly linear stream valleys along Hills Creek, Salt Creek, and the Middle Fork of the Willamette River. They were mapped on the basis of airphoto reconnaissance by Pezzopane (1993 #3544), although no geomorphic features suggestive of late Quaternary displacement were observed (S.K. Pezzopane, pers. commun., 1993, in Geomatrix Consultants Inc., 1995 #3593). No fault scarps on Quaternary deposits have been described.</p>
Age of faulted surficial deposits	<p>These faults were mapped by Pezzopane (1993 #3544) from airphoto reconnaissance; the faults are mapped primarily in Tertiary and Quaternary volcanic and volcanoclastic rocks of the Cascade Range (Sherrod, 1991 #3568; Walker and MacLeod, 1991 #3646). U.S. Army Corps of Engineers (1981 #3481) note slickensides on a fault in Pleistocene gravels along the Middle Fork Willamette River lineament in the Dexter Dam excavations,</p>

	and "discontinuities" in rocks of the Pleistocene High Cascade Group or Province along the Hills Creek lineament. Woller and Black (1983 #4057) and Woller and Priest (1983 #4056) found no evidence of post-Tertiary movement on faults or lineaments associated with the Eugene-Denio zone.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) <i>Comments:</i> Pezzopane (1993 #3544) and subsequent compilations (Geomatrix Consultants Inc., 1995 #3593; Madin and Mabey, 1996 #3575) show these features as active in the Quaternary (<1.6 Ma). Geomatrix Consultants, Inc. (1995 #3593) used the poor geomorphic expression of these faults to preclude their inclusion in their analysis of active faults in the state of Oregon. We classify these features as Class B because evidence of Quaternary deformation is equivocal.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> The lack of significant geomorphic expression along these faults suggest low rates of slip.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#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. #3506 Lawrence, R.D., 1976, Strike-slip faulting terminates the Basin and Range province in Oregon: Geological Society of America Bulletin, v. 87, p. 846-850. #3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon: State of Oregon, Department of Geology and Mineral Industries Geological Map Series GMS-100, 1 sheet. #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.

#3568 Sherrod, D.R., 1991, Geologic map of a part of the Cascade Range between latitudes 43°-44°, central Oregon: U.S. Geological Survey Miscellaneous Investigations Map I-1891, 2 sheets, scale 1:125,000.

#3481 U.S. Army Corps of Engineers, 1981, Lookout Point, Dexter Hills Creek and Fall Creek Lakes earthquake and fault study—Design memorandum 6: U.S. Army Corps of Engineers, Portland District, 100 p., 18 pls.

#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.

#4057 Woller, N.M., and Black, G.L., 1983, Geology of the Waldo Lake-Swift Creek Area, Lane and Klamath Counties, Oregon, *in* Priest, G.R., and Vogt, B.F., eds., *Geology and geothermal resources of the central Oregon Cascade Range*, Chapter 6: State of Oregon, Department of Geology and Mineral Industries Special Paper 15, p. 57-87, 3 pls., scale 1:62,500.

#4056 Woller, N.M., and Priest, G.R., 1983, Geology of the Lookout Point Area, Lane County, Oregon, Chapter 5, *in* Priest, G.R., and Vogt, B.F., eds., *Geology and geothermal resources of the central Oregon Cascade Range*: State of Oregon, Department of Geology and Mineral Industries Special Paper 15, p. 49-56, 3 pls., scale 1:62,500.

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