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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.

Paulina Marsh faults (Class A) No. 834

Last Review Date: 2016-03-28

citation for this record: **Personius, S.F., compiler, 2002, Fault number 834, Paulina Marsh faults, 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 03:15 PM.**

Synopsis	These northwest-trending faults are located in and along the margins of Paulina M a large wetland occupying an internally drained basin in the southwestern corner Fort Rock Valley, that is underlain by Pleistocene and Holocene alluvial and lacu deposits. Most faults in the zone offset Miocene to Pliocene volcanic rocks in upl around the marsh, but the Paulina Marsh fault is marked on the floor of the marsh less than 2-m-high, down-to-the-southwest fault scarp on deposits that may conta Holocene Mazama ash. Airphoto analysis suggests possible right-lateral displace of stream channels on the Paulina Marsh fault, but the other faults are mapped as normal or high-angle faults. Most faults in the zone are inferred to have Quaterna (<1.6 Ma) or middle and late Quaternary (<780 ka) displacement, but the Paulina Marsh fault may have been active in the Holocene.
Name comments	These faults are located in and along the margins of Paulina Marsh, a large wetla located north of Silver Lake in central Oregon; one fault on the floor of the marsh named the Paulina Marsh fault by Pezzopane (1993 #3544).

	Fault ID: This zone includes fault number 30 of Pezzopane (1993 #3544) and fa number 56 of Geomatrix Consultants, Inc. (1995 #3593).
County(s) and State(s)	LAKE COUNTY, OREGON
Physiographic province(s)	COLUMBIA PLATEAU BASIN AND RANGE
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 and ot (1967 #3564) and MacLeod and Sherrod (1992 #3566), and 1:100,000-scale map by Weldon ant others (2002 #5648).
Geologic setting	These northwest-trending faults are located in and along the margins of Paulina M a large wetland occupying an internally drained basin in the southwestern corner Fort Rock Valley that is underlain by Pleistocene and Holocene alluvial and lacus deposits; most faults offset Miocene to Pliocene volcanic rocks in uplands aroun marsh (Hampton, 1964 #3790; Walker and others, 1967 #3564; Walker and MacL 1991 #3646; MacLeod and Sherrod, 1992 #3566).
Length (km)	31 km.
Average strike	N25°W
Sense of movement	Normal *Comments:* Airphoto analysis suggests possible right-lateral displacement of strea channels across the Paulina Marsh fault (Pezzopane, 1993 #3544), but Pezzopane (1993 #3544) and Geomatrix Consultants, Inc. (1995 #3593) map the fault as a n or high angle fault. Other faults in the zone are mapped as normal or high-angle f (Hampton, 1964 #3790; Walker and others, 1967 #3564; Walker and MacLeod, 1 #3646; MacLeod and Sherrod, 1992 #3566).
Dip Direction	SW; NE *Comments:* Geomatrix Consultants, Inc. (1995 #3593) used a near vertical dip in analysis of earthquake hazards associated with the Paulina Marsh fault. Other fau the zone are mapped as normal or high-angle faults of unknown dip.
Paleoseismology	

studies	
Geomorphic expression	The Paulina Marsh fault is marked by a less than 2-m-high, down-to-the-southwe fault scarp on late Quaternary alluvial and lacustrine deposits on the floor of Paul Marsh; airphoto analysis suggests possible right-lateral displacement of stream channels (Pezzopane, 1993 #3544). No descriptions of the geomorphic expressio the other faults in the zone have been published, but they appear to form low (<1(high) escarpments and shallow grabens on volcanic bedrock. Weldon and others (#5648) observed lineaments across Quaternary deposits on 1:100,000-scale DEM the area.
Age of faulted surficial deposits	The Paulina Marsh fault has been mapped using airphoto analysis (Pezzopane, 19 #3544) in Pleistocene and Holocene alluvial and lacustrine deposits (Hampton, 1 #3790; Walker and others, 1967 #3564; Walker and MacLeod, 1991 #3646; MacI and Sherrod, 1992 #3566). Pezzopane (1993 #3544) observed yellowish Mazama pumice in stream cut exposures along the base of the scarp, suggesting a Holocen for some of the offset deposits. The other faults in the zone are mapped as offsetti Miocene to Pliocene volcanic rocks; no fault scarps on Quaternary deposits have described along these faults, although some of these faults are mapped as juxtapo Quaternary sediment against volcanic bedrock (Hampton, 1964 #3790; Walker ar others, 1967 #3564; Walker and MacLeod, 1991 #3646).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Pezzopane (1993 #3544) and subsequent compilations (Geomatrix Consultants Inc., 1995 #3593; Madin and Mabey, 1996 #3575; Weldon and other 2002 #5648) infer latest Quaternary displacement on the Paulina Marsh fault, bas probable presence of Mazama ash in offset deposits along the scarp. Weldon and (2002 #5648) infer Quaternary (<1.6 Ma) displacement on most of the other fault the zone, with the exception of the three southernmost faults, for which they infe middle and late Quaternary (<780 ka) displacement.
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* Geomatrix Consultants, Inc. (1995 #3593) used the maximum scarp h of 2 m measured along the fault and a maximum age of 6.8 ka, based on the prob presence of the Mazama ash in offset deposits (Pezzopane, 1993 #3544), to calcu vertical displacement rate of 0.3 mm/yr for the Paulina Marsh fault. The other fau the zone have no published slip data, but the low escarpments formed on Miocen Pliocene volcanic bedrock imply low rates of long-term slip.

Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#3593 Geomatrix Consultants, Inc., 1995, Seismic design mapping, State of Oreg Technical report to Oregon Department of Transportation, Salem, Oregon, under Contract 11688, January 1995, unpaginated, 5 pls., scale 1:1,250,000. #3790 Hampton, E.R., 1964, Geologic factors that control the occurrence and availability of ground water in the Fork Rock Basin Lake County, Oregon: U.S. Geological Survey Professional Paper 383-B, 29 p., 2 pls., scale 1:62,500. #3566 MacLeod, N.S., and Sherrod, D.R., 1992, Reconnaissance geologic map o west half of the Crescent 1° by 2° quadrangle, central Oregon: U.S. Geological S Miscellaneous Investigations Map I-2215, 1 sheet, scale 1:250,000. #3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon: of Oregon, Department of Geology and Mineral Industries Geological Map Serie GMS-100, 1 sheet. #3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in O Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p. #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. #3564 Walker, G.W., Peterson, N.V., and Greene, R.C., 1967, Reconnaissance ge map of the east half of the Crescent quadrangle Lake, Deschutes, and Crook Cou Oregon: U.S. Geological Survey Miscellaneous Geologic Investigations I-493, 1 scale 1:250,000. #5648 Weldon, R.J., Fletcher, D.K., Weldon, E.M., Scharer, K.M., and McCrory, 2002, An update of Quaternary faults of central and eastern Oregon: U.S. Geolog Survey Open-File Report 02-301 (CD-ROM), 26 sheets, scale 1:100,000.