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.

Sky Lakes fault zone (Class A) No. 844

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citation for this record: **Personius, S.F., compiler, 2002, Fault number 844, Sky Lakes 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 03:15 PM.**

Synopsis	These north- and northwest-striking, mostly down-to-the-east normal faults offse Miocene and Pliocene to Pleistocene volcanic rocks, and probably are older struc related to the western margin of the Klamath graben. These faults form prominen escarpments on late Tertiary and Quaternary volcanic rocks. Scarps range in heig from less than 10 m to as much as 300 m; most are less than 30 m high and have angles of less than 25°. Scarps are formed on bedrock, and in most places are cov by late Pleistocene (approximately 10–30 ka) glacial deposits and Holocene collu Although most faults in the zone have been active in the middle and late Quatern least one fault strand near the northern end of the zone has apparently been active the latest Quaternary.
Name comments	The Sky Lakes fault zone has been mapped by Carver (1972 #5190), Smith and o (1982 #3493), Moring (1983 #3554), Smith (1983 #3556; 1988 #3555), Sherrod a Pickthorn (1992 #3567), and Sherrod and Smith (2000 #5165), and mapped and r by Hawkins and others (1989 #3548). Following Hawkins and others (1989 #354 and Weldon and others (2002 #5648), herein we include Lake of the Woods fault,

	longest and most prominent fault in this zone, and the Mount McLoughlin fault i Sky Lakes fault zone; we also include other primarily east-down normal faults th continue on a southeasterly trend to the Oregon-California border. **Fault ID:** This group of structures is included in fault number 38 of Pezzopane (#3544) and in fault number 53 of Geomatrix Consultants, Inc. (1995 #3593).
County(s) and State(s)	KLAMATH COUNTY, OREGON
Physiographic province(s)	CASCADE-SIERRA MOUNTAINS
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location of the northern part of the fault from 1:100,000-scale mappi Weldon and others (2002 #5648), based on 1:250,000-scale mapping of Smith an others (1982 #3493), 1:125,000-scale mapping of Moring (1983 #3554), approxi 1:100,000-scale mapping of Hawkins and others (1989 #3548), and 1:500,000-sc mapping of Walker and MacLeod (1991 #3646), Pezzopane (1993 #3544), and S and Smith (2000 #5165). Location of the southern part of the fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/Map downloaded 06/02/2016) attributed to Jenks (2007 #7794).
Geologic setting	These north- and northwest-striking, mostly down-to-the-east normal faults offse Miocene and Pliocene to Pleistocene volcanic rocks (Smith, 1988 #3555; Sherro Pickthorn, 1989 #3599; Walker and MacLeod, 1991 #3646), west of the Klamath graben. These faults reflect the north- and northeast-striking fault pattern of the Klamath graben, and probably are older structures related to the western margin graben (Smith, 1983 #3556). Young faults with similar trends are present across t border in northern California (Gay and Aune, 1958 #4890; Jennings, 1994 #2878
Length (km)	85 km.
Average strike	N18°W
Sense of movement	Normal *Comments:* These faults are mapped as normal or high-angle faults by Smith and others (1982 #3493), Moring (1983 #3554), Smith (1983 #3556; 1988 #3555), Sh and Pickthorn (1992 #3567), Walker and MacLeod (1991 #3646), Pezzopane (19 #3544), and Sherrod and Smith (2000 #5165).
Dip Direction	E; W

	Comments: No detailed structural data have been published, but Geomatrix Consultants, Inc. (1995 #3593) used an estimated dip of 70° in their analysis of earthquake hazards associated with faults in the Sky Lakes fault zone.
Paleoseismology studies	
Geomorphic expression	These faults form prominent escarpments on late Tertiary and Quaternary volcani rocks. Scarps range in height from less than 10 m to as much as 300 m; most are than 30 m high and have slope angles of less than 25° (Hawkins and others, 1989 #3548). Scarps are formed on bedrock, and in most places are covered by late Pleistocene (approximately 10–30 ka) glacial deposits and Holocene colluvium (Hawkins and others, 1989 #3548).
Age of faulted surficial deposits	Individual faults in the zone offset Pleistocene volcanic rocks; these rocks are poo dated but are probably lower Pleistocene (0.78–2.0 Ma) in age (Sherrod and Smit 2000 #5165). Walker and MacLeod (1991 #3646) map some fault strands at the southern end of the fault zone in Holocene (?) and Pleistocene volcanic rocks. Mo the most prominent faults are covered by late Pleistocene (approximately 10-30 k glacial deposits and Holocene colluvium (Hawkins and others, 1989 #3548).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* Hawkins and others (1989 #3548) indicate that latest movements on f in the northern part of the Sky Lakes fault zone predate the latest Pleistocene (>1(ka). Pezzopane (1993 #3544) and Geomatrix Consultants, Inc. (1995 #3593) clas most of these faults as middle and late Quaternary (<700–780 ka) or probable Quaternary (<1.6–1.8 Ma), but they map two fault strands with latest Pleistocene Holocene (<10–20 ka) displacement. The age constraints on the northernmost of two young faults is based on work of Carver (1972 #5190) and (G.A. Carver, wri commun., 1994, in Geomatrix Consultants Inc., 1995 #3593); this part of the Lak the Woods fault apparently offsets late Pleistocene moraines and thus has underg latest Quaternary (<20 ka) movement. Weldon and others (2002 #5648) infer a va of ages of latest movement, including latest Quaternary (<18 ka) on a long fault s near the northern end of the Sky Lakes fault zone.
Recurrence interval	>10–30 ky *Comments:* Hawkins and others (1989 #3548) used the lack of scarps on latest Pleistocene (10–30 ka) glacial deposits and Holocene colluvium to suggest that recurrence intervals must be longer than 10–30 ky.

Slip-rate category	Less than 0.2 mm/yr *Comments:* No detailed slip rate data have been published, but Geomatrix Consul Inc. (1995 #3593) used offsets of 300 m in 0.73–2.0 Ma rocks to calculate possib long-term rates of 0.15–0.4 mm/yr, but used a preferred rate of 0.01–0.2 mm/yr i analysis of earthquake hazards associated with the Sky Lakes fault zone.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#5190 Carver, G.A., 1972, Glacial geology of the Mountain Lakes Wilderness an adjacent parts of the Cascade Range, Oregon: Seattle, University of Washington, unpublished Ph.D. dissertation, 75 p. #4890 Gay, T.E., and Aune, Q.A., 1958, Alturas Sheet: California Division of Mi and Geology Geologic Atlas of California, GAM001, scale 1:250,000. #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. #3548 Hawkins, F.F., Foley, L.L., and LaForge, R.C., 1989, Seismotectonic study Fish Lake and Fourmile Lake Dams, Rogue River Basin Project, Oregon: U.S. Bu of Reclamation Seismotectonic Report 89-3, 26 p., 2 pls. #7794 Jenks, M.D., 2007, Geologic compilation map of part of the Upper Klama Basin, Klamath County, Oregon: Oregon Department of Geology and Mineral Industries Open-File Report O-2007-05, 7 p., scale 1:100,000. #2878 Jennings, C.W., 1994, Fault activity map of California and adjacent areas, locations of recent volcanic eruptions: California Division of Mines and Geology Geologic Data Map 6, 92 p., 2 pls., scale 1:750,000. #7789 Ma, L., Madin, I.P., Olson, K.V., Watzig, R.J., Wells, R.E., Niem, A.R., an Priest, G.R., (compilers), 2009, Oregon geologic data compilation [OGDC], relea (statewide): Oregon Department of Geology and Mineral Industries Digital Data Series. #3554 Moring, B., 1983, Reconnaissance surficial geologic map of the Medford quadrangle, Oregon-California: U.S. Geological Survey Miscellaneous Field Stu Map MF-1528, 2 sheets, scale 1:125,000. #3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in O Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.

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Blackwell, D.D., eds., Geological, geophysical, and tectonic setting of the Cascac
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#5165 Sherrod, D.R., and Smith, J.G., 2000, Geologic map of upper Eocene to
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Preliminary geologic map of the Medford 1x2 quadrangle, Oregon and California
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#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.

#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
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