

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](#).

Goose Lake graben faults (Class A) No. 828

Last Review Date: 2016-03-25

citation for this record: Personius, S.F., compiler, 2002, Fault number 828, Goose Lake graben 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 02:20 PM.

Synopsis	These north-trending normal faults form a large graben that confines the Goose Lake basin. The basin-margin faults are marked by faceted spurs and fault-related ridges along oversteepened mountain fronts in Miocene to Oligocene volcanic and volcanoclastic sedimentary rocks. Only one short fault scarp on Quaternary deposits has been described along these faults, but high rates of colluvial deposition may obscure geomorphic evidence of most young fault scarps. Pleistocene (?) lake deposits are offset by small faults on the valley floor, and Pliocene (?)–Pleistocene lake sediments and terrace deposits that may be remnants of lake shorelines may be uplifted along eastern graben fault near Lakeview. Gravity and well-log data indicate that the Goose Lake basin may be filled with as much as 1,500 m of unconsolidated sediment. The most recent surface rupture of the eastern graben faults probably occurred in the middle and late Quaternary, and mostly in the Quaternary on the western graben faults.
Name comments	These faults are named after Goose Lake and the Goose Lake basin, a large graben system in the Basin and Range of southern Oregon and northeastern California. The faults were originally mapped by Walker (1963 #3565) in Oregon and by Gay and

	<p>Aune (1958 #4890) in California, with additions from Peterson and McIntyre (19 #3791), Peterson and others (1980 #3562), Pezzopane (1993 #3544), and Klinger others (1996 #3729). Gay and Aune (1958 #4890) name the fault that forms the e margin of the graben the Goose Lake fault.</p> <p>Fault ID: These structures are fault number 43 of Pezzopane (1993 #3544), fault number 59 of Geomatrix Consultants, Inc. (1995 #3593), and fault number 7A of Jennings (1994 #2878).</p>
County(s) and State(s)	LAKE COUNTY, OREGON MODOC COUNTY, CALIFORNIA
Physiographic province(s)	BASIN AND RANGE
Reliability of location	<p>Good Compiled at 1:62,500 and 1:250,000 scale.</p> <p><i>Comments:</i> In Oregon, location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/Map8 downloaded 06/02/2016) attributed to 1:62,500-scale mapping of Peterson and ot (1980 #3562), and 1:250,000-scale mapping of Walker (1963 #3565) supplement with fault traces from 1:100,000-scale mapping of Weldon and others (2002 #564 Fault traces in California are from 1:750,000-scale mapping of Jennings (1994 #2 based on 1:250,000-scale mapping of Gay and Aune (1958 #4890).</p>
Geologic setting	<p>These north-trending normal faults form a graben that confines the Goose Lake b The faults are marked by prominent escarpments on Miocene to Oligocene volca and volcanoclastic sedimentary rocks (Walker, 1963 #3565; Walker and MacLeod 1991 #3646). Gravity and well-log data indicate that the Goose Lake basin may b filled with as much as 1,500 m of unconsolidated sediment (Peterson and others, #3562).</p>
Length (km)	55 km.
Average strike	N9°W
Sense of movement	<p>Normal</p> <p><i>Comments:</i> These faults are mapped as normal or high-angle faults by Walker (19 #3565), Walker and MacLeod (1991 #3646), Pezzopane (1993 #3544), and Kling and others (1996 #3729). Klinger and others (1996 #3729) describe a west-dippir fault exposure in a gravel pit just south of Lakeview with well preserved slickens that indicate dip-slip motion.</p>
Dip	51° W

	<p><i>Comments:</i> Peterson and McIntyre (1970 #3791) and Peterson and others (1980 #3562) describe "near vertical" exposures of the east Goose Lake graben fault near Lakeview; Klinger and others (1996 #3729) describe a fault exposure on their Goose Lake fault in a gravel pit just south of Lakeview with a westerly dip of 51°.</p>
<p>Paleoseismology studies</p>	
<p>Geomorphic expression</p>	<p>The range-bounding Goose Lake graben faults are marked by faceted spurs and related ridges along oversteepened mountain fronts (Pezzopane and Weldon, 1993 #149; Pezzopane, 1993 #3544; Geomatrix Consultants Inc., 1995 #3593). These workers do not describe fault scarps on Quaternary deposits along these faults, but rates of colluvial deposition may obscure geomorphic evidence of young fault scarps (Pezzopane and Weldon, 1993 #149; Pezzopane, 1993 #3544; Geomatrix Consultants Inc., 1995 #3593). Pleistocene (?) lake deposits are offset by small faults on the valley fronts (Pezzopane and Weldon, 1993 #149; Pezzopane, 1993 #3544). Klinger and others (1996 #3729) describe a 1- to 2-m-high fault scarp in a small alluvial fan about 1 km south of Warner Canyon near the northern end of the eastern graben fault. They also describe the prominent mountain front that parallels the eastern graben fault, which is more sinuous and dissected than the range front along the nearby (and more active) Surprise Valley fault in northeastern California.</p>
<p>Age of faulted surficial deposits</p>	<p>Fault scarps on Quaternary deposits have only been described in one location along the eastern Goose Lake graben fault (Klinger and others, 1996 #3729), but high rates of colluvial deposition may obscure geomorphic evidence of young fault scarps (Pezzopane and Weldon, 1993 #149; Pezzopane, 1993 #3544; Geomatrix Consultants Inc., 1995 #3593). Pleistocene (?) lake deposits are offset by small faults on the valley floor, and Plio (?)–Pleistocene lake sediments and terrace deposits (Peterson and others, 1980 #3562) that may be remnants of lake shorelines may be uplifted along the eastern graben fault near Lakeview (Pezzopane and Weldon, 1993 #149; Pezzopane, 1993 #3544).</p>
<p>Historic earthquake</p>	
<p>Most recent prehistoric deformation</p>	<p>late Quaternary (<130 ka)</p> <p><i>Comments:</i> Pezzopane (1993 #3544), and subsequent compilations (Jennings, 1993 #2878; Geomatrix Consultants Inc., 1995 #3593; Madin and Mabey, 1996 #3575; Weldon and others, 2002 #5648) infer middle and late Quaternary (<700–780 ka) displacement on the eastern graben faults, and mostly Quaternary (<1.6–1.8 Ma) displacement on the western graben faults in the Goose Lake Valley. Klinger and others (1996 #3729) infer late Quaternary displacement on the eastern graben fault based on the presence of a 1- to 2-m-high fault scarp in a small alluvial fan near t</p>

	northern end of the eastern Goose Lake graben fault. Sherrod (1993 #3510) assigned an age of <35 ka for activity on the eastern graben fault, but did not discuss the basis for this age assignment.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr <i>Comments:</i> Geomatrix Consultants, Inc. (1995 #3593) used an estimate of 100 m uplift and an estimated age of 1–2 Ma of possibly offset lacustrine features identified by Peterson and others (1980 #3562), Pezzopane (1993 #3544) and Pezzopane and Weldon (1993 #149), to estimate a long-term slip rate of 0.05–0.1 mm/yr.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#4890 Gay, T.E., and Aune, Q.A., 1958, Alturas Sheet: California Division of Mines and Geology Geologic Atlas of California, GAM001, scale 1:250,000. #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. #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. #3729 Klinger, R.E., Vetter, U.R., and Ryter, D.W., 1996, Seismotectonic study for Gerber Dam Klamath Project, California-Oregon: U.S. Bureau of Reclamation Seismotectonic Report 96-1, 51 p., 1 pl. #3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon: Oregon Department of Geology and Mineral Industries Geological Map Series GMS-100, 1 sheet. #3791 Peterson, N.V., and McIntyre, J.R., 1970, The reconnaissance geology and mineral resources of eastern Klamath County and western Lake County, Oregon: Oregon Department of Geology and Mineral Industries Bulletin 66, 70 p., 1 pl. scale 1:250,000. #3562 Peterson, N.V., Brown, D.E., and McLean, G.D., 1980, Preliminary geologic and geothermal resource potential of the Lakeview Area, Oregon: State of Oregon, Department of Geology and Mineral Industries Open-File Report O-80-9, 108 p., 2 pls., scale 1:62,500.

#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 central Oregon: *Tectonics*, v. 12, p. 1140-1169.

#3510 Sherrod, D.R., 1993, Historic and prehistoric earthquakes near Klamath Falls, Oregon: *Earthquakes and Volcanoes*, v. 24, no. 3, p. 106-120.

#3565 Walker, G.W., 1963, Reconnaissance geologic map of the eastern half of the Klamath Falls (AMS) quadrangle, Lake and Klamath Counties, Oregon: U.S. Geological Survey Mineral Investigations Field Studies Map MF-260, 1 sheet, scale 1:250,000.

#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. Geological Survey Open-File Report 02-301 (CD-ROM), 26 sheets, scale 1:100,000.

[Questions or comments?](#)

[Facebook](#) [Twitter](#) [Google](#) [Email](#)

[Hazards](#)

[Design](#) [Ground Motions](#) [Seismic Hazard Maps & Site-Specific Data](#) [Faults](#) [Scenarios](#)

[Earthquakes](#) [Hazards](#) [Data](#) [Education](#) [Monitoring](#) [Research](#)

[Home](#) [About Us](#) [Contacts](#) [Legal](#)