Jump to Navigation

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 East Christmas Lake Valley faults (Class A) No. 1803

Last Review Date: 2002-12-10

citation for this record: **Personius, S.F., compiler, 2002, Fault number 1803, unnamed East Christmas Lake Valley 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 02:24 PM.**

Synopsis	These northwest-trending high-angle faults are located in the central part of the Brothers fault zone [819], a 250- to 300-km long zone of high-angle faulting that be the surface manifestation of a regional-scale right-lateral shear zone. The fault form escarpments on Miocene and Pliocene bedrock; in some places, the faults ar mapped as juxtaposing Quaternary sediments against bedrock, but no fault scarps Quaternary deposits have been described along their traces. Analyses of airphotos 1:100,000-scale DEMs were used to infer Quaternary displacement on these fault
Name comments	This group of unnamed faults is located east of Christmas Lake Valley and were originally mapped by Hampton (1964 #3790) and Walker and others (1967 #3564 From north to south, these faults form the eastern margin of Christmas Lake Valle along Wildcat Butte, Stauffer Rim and the western margin of Overall Flat, the ma between Rams Butte and the eastern margin of Jew Valley, and part of the northw margin of Alkali Valley.

County(s) and State(s)	LAKE COUNTY, OREGON
Physiographic province(s)	COLUMBIA PLATEAU
Reliability of location	Good Compiled at 1:100,000 scale. *Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to 1:62,000-scale mapping by Walker and Mc (1980 #7798) and 1:250,000-scale mapping of Walker and others (1967 #3564).
Geologic setting	These northwest-trending high-angle faults are located in the central part of the Brothers fault zone [819], a 250- to 300-km-long zone of high-angle faulting that be the surface manifestation of a regional-scale right-lateral shear zone (Walker, 1 #4296; Stewart and others, 1975 #3769; Lawrence, 1976 #3506; Walker and Nolf 1981 #4310; 1981 #4311). The area is underlain by Miocene and Pliocene volcan tuffaceous sedimentary rocks (Hampton, 1964 #3790; Walker and others, 1967 #3 Walker and MacLeod, 1991 #3646).
Length (km)	42 km.
Average strike	N24°W
Sense of movement	Normal *Comments:* These structures as depicted as normal or high-angle faults on maps c Hampton (1964 #3790), Walker and others (1967 #3564), Walker and MacLeod (#3646). If they are part of the Brothers fault zone [819], then they may represent of the surface manifestations of a regional right-lateral shear zone (Lawrence, 19 #3506).
Dip Direction	NE; W
Paleoseismology studies	
Geomorphic expression	These northwest-trending faults form 20- to 80-m-high escarpments on Miocene Pliocene rocks along the margins of Christmas Lake Valley, Overall Flat, Jew Val and Alkali Valley. No data on the geomorphic expression of these escarpments ha been described, but Weldon and others (2002 #5648) observed lineaments across Quaternary deposits on 1:100,000-scale DEMs.
Age of faulted	These northwest-trending faults form escarpments on Miocene and Pliocene bedr

surficial deposits	in some places, the faults are mapped as juxtaposing Quaternary sediments agains bedrock (Hampton, 1964 #3790; Walker and others, 1967 #3564; Walker and MacLeod, 1991 #3646), but no fault scarps in Quaternary deposits have been des along their traces.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Weldon and others (2002 #5648) used analysis of airphotos and 1:10(scale DEMs to infer Quaternary displacement on these faults. No other fault compilations in the region include these faults as potential seismic sources (Pezzo 1993 #3544; Geomatrix Consultants Inc., 1995 #3593; Madin and Mabey, 1996 #3575).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* No published slip data are available for the unnamed faults east of Christmas Lake Valley. The largest of these faults is marked by 80-m-high escarp on Pliocene and Miocene volcanic rocks; such slip data indicate low long-term ra 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. #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: 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 Or Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.

#3769 Stewart, J.H., Walker, G.W., and Kleinhampl, F.J., 1975, Oregon-Nevada lineament: Geology, v. 3, no. 5, p. 265-268.

#4296 Walker, G.W., 1969, Geology of the High Lava Plains Province, *in* Minera water resources of Oregon: State of Oregon, Department of Geology and Mineral Industries Bulletin 64, p. 77-79.

#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.

#7798 Walker, G.W., and McHugh, E.L., 1980, Mineral resources of the Lost For Instant Wilderness study area, Oregon: U.S. Geological Survey Open-File Report 846.

#4310 Walker, G.W., and Nolf, B., 1981, High Lava Plains, Brothers fault zone to Harney Basin, Oregon, *in* Johnston, D.A., and Donnelly-Nolan, J., eds., Guides to some volcanic terranes in Washington, Idaho, Oregon, and northern California: U Geological Survey Circular 838, p. 105-111.

#4311 Walker, G.W., and Nolf, B., 1981, Roadlog for High Lava Plains, Brothers zone to Harney Basin, Oregon, *in* Johnston, D.A., and Donnelly-Nolan, J., eds., G to some volcanic terranes in Washington, Idaho, Oregon, and northern California Geological Survey Circular 838, p. 113-140.

#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.