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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.

Thompson Ridge fault (Class A) No. 793

Last Review Date: 2002-05-17

citation for this record: **Personius, S.F., compiler, 2002, Fault number 793, Thompson Ridge fault, 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	The northwest-striking, left-lateral Thompson Ridge fault offsets poorly consolidated accretionary wedge sediments incorporated in the Coos Basin slide, a super-scale submarine landslide thought to have formed about 450 ka. These sediments underlie the continental slope in the forearc of the Cascadia subduction zone [781]. The fault appears to offset the active deformation front, but evidence of offset of the subducting Juan de Fuca Plate is equivocal. The Thompson Ridge fault is the best expressed bathymetrically of all the strike-slip faults mapped in the accretionary wedge, and is mapped as multiple surficial scarps and aligned and offset fold axes in poorly consolidated sediments of unknown age on the lower continental slope. Similarities with other faults suggest most recent movement in the late Pleistocene and Holocene. However, as with other folds and faults located in the Cascadia forearc, it is unknown if coseismic displacements on this fault are always related to great megathrust earthquakes on

	the subduction zone, or whether some independent displacements are related to smaller earthquakes in the overriding North American Plate.
Name comments	The Thompson Ridge fault was originally mapped by Goldfinger and others (1992 #464), and named the Thompson Ridge fault by Goldfinger (1994 #3972). **Fault ID:** This structure is included in fault number 21 of Pezzopane (1993 #3544) and is fault number 6 of Geomatrix Consultants, Inc. (1995 #3593).
County(s) and State(s)	COOS COUNTY, OREGON (offshore)
Physiographic province(s)	PACIFIC BORDER (offshore)
Reliability of location	Poor Compiled at 1:500,000 scale. *Comments:* The fault trace is from 1:500,000-scale mapping of Goldfinger and others (1992 #464).
Geologic setting	The northwest-striking, left-lateral Thompson Ridge fault offsets poorly consolidated accretionary wedge sediments incorporated in the Coos Basin slide, a super-scale submarine landslide thought to have formed about 450 ka (Goldfinger and others, 2000 #5041). These sediments underlie the continental slope in the forearc of the Cascadia subduction zone [781]. The fault appears to offset the active deformation front, but evidence of offset of the subducting Juan de Fuca Plate is equivocal (Goldfinger and others, 1992 #464; Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090). As with other folds and faults located in the Cascadia forearc, it is unknown if coseismic displacements on this fault are always related to great megathrust earthquakes on the subduction zone, or whether some independent displacements are related to smaller earthquakes in the overriding North American Plate (Goldfinger and others, 1992 #446; Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090; McNeill and others, 1998 #4089).
Length (km)	49 km.
Average strike	N56°W

Sense of movement	Left lateral *Comments:* The Thompson Ridge fault is mapped as a left-lateral strike slip fault (Goldfinger and others, 1992 #464; Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090).
Dip	90° *Comments:* Dip estimate based on geophysical data (Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090).
Paleoseismology studies	
Geomorphic expression	The Thompson Ridge fault is the best expressed bathymetrically of all the strike-slip faults mapped in the accretionary wedge; the fault is mapped as multiple surficial scarps and aligned and offset fold axes in poorly consolidated landslide sediments on the lower continental slope (Goldfinger and others, 1992 #464; Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090, 2000 #5041).
Age of faulted surficial deposits	The Thompson Ridge fault offsets poorly consolidated accretionary wedge sediments incorporated in the Coos Basin slide, a super-scale submarine landslide thought to have formed about 450 ka (Goldfinger and others, 2000 #5041).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* The Thompson Ridge fault offsets poorly consolidated landslide deposits thought to have formed about 450 ka (Goldfinger and others, 2000 #5041). However, its similarity to other active faults in the accretionary wedge suggests most recent movement in the latest Quaternary. The fault is mapped as active in the Holocene or late Pleistocene by Goldfinger and others (1992 #464), Geomatrix Consultants, Inc. (1995 #3593), and Madin and Mabey (1996 #3575).
Recurrence interval	
Slip-rate category	Greater than 5.0 mm/yr

	Comments: No data on slip rates have been collected, but Goldfinger (1994 #3972) used values from other similar faults to estimate a slip rate of 5.5 mm/yr, and Geomatrix Consultants, Inc. (1995 #3593) used estimated slip rates of 1.0–8.0 mm/yr in their analysis of earthquake hazards associated with the Thompson Ridge fault.
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. #3972 Goldfinger, C., 1994, Active deformation of the Cascadia Forearc—Implications for great earthquake potential in Oregon and Washington: Oregon State University, unpublished Ph.D. dissertation, 246 p., http://hdl.handle.net/1957/36664. #5041 Goldfinger, C., Kulm, L.D., McNeill, L.C., and Watts, P., 2000, Super-scale failure of the southern Oregon Cascadia margin: Pure and Applied Geophysics, v. 157, p. 1189-1226. #446 Goldfinger, C., Kulm, L.D., Yeats, R.S., Appelgate, B., MacKay, M.E., and Moore, G.F., 1992, Transverse structural trends along the Oregon convergent margin—Implications for Cascadia earthquake potential and crustal rotations: Geology, v. 20, p. 141-144. #4090 Goldfinger, C., Kulm, L.D., Yeats, R.S., McNeill, L., and Hummon, C., 1997, Oblique strike-slip faulting of the central Cascadia submarine forearc: Journal of Geophysical Research, v. 102, no. B4, p. 8217-8243. #464 Goldfinger, C., Kulm, L.D., Yeats, R.S., Mitchell, C., Weldon, R., II, Peterson, C., Darienzo, M., Grant, W., and Priest, G.R., 1992, Neotectonic map of the Oregon continental margin and adjacent abyssal plain: State of Oregon, Department of Geology and Mineral Industries Open-File Report 0-92-4, 17 p., 2 pls. #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.

	#4089 McNeill, L.C., Goldfinger, C., Yeats, R.S., and Kulm, L.D., 1998, The effects of upper pl. deformation on records of prehistoric Cascadia subduction zone earthquakes, *in* Stewart, I.S., and Vita-Finzi, C., eds., Coastal tectonics: Geological Society Special Publication No. 146, p. 321-342. #3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in Oregon: Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.