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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.

Waldport faults (Class A) No. 886

Last Review Date: 2002-05-31

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Synopsis	The Waldport faults are three north-northeast-striking faults that offset marine-terrace sediments and wave-cut platforms in the vicinity of Alsea Bay along the central Oregon coast. The Waldport and Lint Slough faults are down-to-the-east; the very short (approximately 1 km) Reynolds Creek fault is down-to-the-west, but this fault may be an antithetic graben fault to the more prominent Waldport fault. None of these faults appear to project to offshore structures mapped in seismic-reflection profiles, but the greatest cumulative offset along these faults is coincident with Alsea Bay, suggesting that faulting has localized the location of the bay. Sense of slip is unknown, but these faults are probably oblique-slip faults, with left lateral and either extensional or contractional dip slip. The Waldport, Lint Slough, and Reynolds Creek faults offset the approximately 125 ka Yachats marine terrace 15–20 m, 8–15 m, and 7 m, respectively; these data imply low vertical displacement rates in the late Quaternary. As with other folds and faults located in the Cascadia forearc, it is unknown if coseismic displacements on these faults are always

	related to great megathrust earthquakes on the subduction zone, or whether some displacements are related to smaller earthquakes in the North American Plate.
Name comments	Faults in the vicinity of Waldport were mapped and named by Ticknor (1993 #4156); from west to east, these include the Waldport, Reynolds Creek, and Lint Slough faults. These faults have subsequently been described by Kelsey and others (1996 #4111) and McNeill and others (1998 #4089). The Waldport faults are not included on geologic maps of the area (Schlicker and others, 1973 #3983; Snavely and others, 1976 #4305; Walker and Duncan, 1989 #3581; Walker and MacLeod, 1991 #3646).
County(s) and State(s)	LINCOLN COUNTY, OREGON
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Poor Compiled at 1:250,000 scale. *Comments:* The fault trace is from 1:190,000-scale (approximate) figure from Kelsey and others (1996 #4111) transferred to 1:250,000-scale base map.
Geologic setting	The Waldport faults are three north-northeast-striking faults that offset marine-terrace sediments and wave-cut platforms in the vicinity of Alsea Bay along the central Oregon coast (Ticknor, 1993 #4156; Kelsey and others, 1996 #4111). The Waldport and Lint Slough faults are down-east; the very short approximately 1 km) Reynolds Creek fault is down-west, but this fault may be an antithetic graben fault to the more prominent Waldport fault. None of these faults appear to project to offshore structures mapped in seismic-reflection profiles (Kelsey and others, 1996 #4111; McNeill and others, 1998 #4089). As with other folds and faults located in the Cascadia forearc, it is unknown if coseismic displacements on these faults are always related to great megathrust earthquakes on the subduction zone, or whether some displacements are related to smaller earthquakes in the North American Plate.
Length (km)	14 km.
Average strike	N13°E

Sense of movement	Reverse, Left lateral, Normal *Comments:* The Waldport faults vertically offset marine-terrace sediments and wave-cut platforms in the vicinity of Alsea Bay (Ticknor, 1993 #4156; Kelsey and others, 1996 #4111). Faults with similar attitudes are shown as vertical or high angle reverse faults on the cross sections of Schlicker and others (1973 #3983), and Snavely and others (1976 #4305). Kelsey and others (1996 #4111) concluded that most active faults along the Oregon coast are oblique-slip faults, with left lateral and either extensional or contractional dip slip. Geomatrix Consultants, Inc. (1995 #3593) and Wong and others (1999 #4073; 2000 #5137) modeled the Waldport and Lint Slough faults as 60? east dipping normal faults.
Dip Direction	E; W *Comments:* Geomatrix Consultants, Inc. (1995 #3593) and Wong and others (1999 #4073) used an estimated dip of 60° in their probabilistic seismic hazard analysis.
Paleoseismology studies	
Geomorphic expression	The Waldport faults are mapped on the basis of offset marine-terrace sediments and wavecut platforms (Ticknor, 1993 #4156; Kelsey and others, 1996 #4111). The greatest cumulative offset along these faults is coincident with Alsea Bay, suggesting that faulting has localized the location of the bay (Kelsey and others, 1996 #4111; McNeill and others, 1998 #4089). No other geomorphic expression of these faults has been described.
Age of faulted surficial deposits	The Waldport faults offset the approximately 125 ka Yachats and the >200 ka Crestview marine terraces (Ticknor, 1993 #4156; Kelsey and others, 1996 #4111).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* If the faulted marine terrace platforms described by Ticknor (1993 #4156) and Kelsey and others (1996 #4111) are correlative with approximately 125 ka and >200 ka marine highstands, then these faults have displacements in the late Quaternary. Geomatrix Consultants, Inc. (1995 #3593), and

	Madin and Mabey (1996 #3575) show these structures as active in the middle and late Quaternary (<780 ka). Pezzopane (1993 #3544) and Goldfinger and others (1992 #464) do not show the Waldport faults in their fault compilations.
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* Kelsey and others (1996 #4111) estimate vertical displacement rates of 0.1–0.15 mm/yr and 0.07–0.1 mm/yr across the Waldport and Lint Slough faults, respectively; these estimates are based on measured offsets of 15–20 m and 8–15 m of the approximately 125 ka Yachats marine terrace across these faults. Vertical offset of about 7 m of the approximately 125 ka Yachats marine terrace indicate even lower slip rates on the Reynolds Creek fault. Wong and others (1999 #4073; 2000 #5137) assigned slip rates of 0.05–0.1 mm/yr in their modeling of the earthquake hazards associated with the Waldport faults.
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. #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. #4111 Kelsey, H.M., Ticknor, R.L., Bockheim, J.G., and Mitchell, C.E., 1996, Quaternary upper pl. deformation in coastal Oregon: Geological Society of America Bulletin, v. 108, no. 7, p. 843-860. #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.

#3983 Schlicker, H.G., Deacon, R.J., Olcott, G.W., and Beaulieu, J.D., 1973, Environmental geology of Lincoln County, Oregon: State of Oregon, Department of Geology and Mineral Industries, Bulletin 81, 171 p., 6 pls.

#4305 Snavely, P.D., Jr., MacLeod, N.S., Wagner, H.C., and Rau, W.W., 1976, Geologic map of the Waldport and Tidewater quadrangles, Lincoln, Lane, and Benton Counties, Oregon: U.S. Geological Survey Miscellaneous Investigations Map I-866, 1 sheet, scale 1:62,500.

#4156 Ticknor, R., 1993, Late Quaternary crustal deformation on the central Oregon coast as deduced from uplifted wave-cut platforms: Western Washington University, unpublished M.S. thesis, 70 p.

#3581 Walker, G.W., and Duncan, R.A., 1989, Geologic map of the Salem 1 by 2 quadrangle, western Oregon: U.S. Geological Survey Miscellaneous Investigations Map I-1893, 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.

#4073 Wong, I., Silva, W., Bott, J., Wright, D., Thomas, P., Gregor, N., Li, S., Mabey, M., Sojourner, A., and Wang, Y., 1999, Earthquake scenario and probabilistic ground shaking maps for the Portland, Oregon metropolitan area: Technical report to U.S. Geological Survey, under Contract 1434-HQ-96-GR-02727, 16 p., 12 pls.

#5137 Wong, I., Silva, W., Bott, J., Wright, D., Thomas, P., Gregor, N., Li, S., Mabey, M., Sojourner, A., and Wang, Y., 2000, Earthquake scenario and probabilistic ground shaking maps for

	the Portland, Oregon, metropolitan area: State of Oregon, Department of Geology and Mineral Industries Interpretive Map Series IMS-16, 16 p. pamphlet, scale 1:62,500.