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.**

## Yaquina faults (Class A) No. 885

**Last Review Date: 2002-05-31**

***citation for this record:*** **Personius, S.F., compiler, 2002, Fault number 885, Yaquina 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 03:14 PM.**

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| **Synopsis** | The Yaquina faults are three down-to-the-south, east-striking faults that offset ma terrace sediments and wave-cut platforms between Yaquina Head and Yaquina Ba Inland, the Yaquina Head and Yaquina Bay faults offset Miocene through Eocene sedimentary rocks in the Oregon Coast Range. None of these faults appear to pro offshore structures mapped in seismic-reflection profiles. Sense of slip is unknow these faults are probably oblique-slip faults, with left lateral and either extensiona contractional dip slip. The Nye Beach and Yaquina Head faults offset the approximately 80 ka Newport marine terrace about 1.7 and 1.5 m, respectively. T Yaquina Bay fault offsets the approximately 80 ka Newport, the approximately 1( Waconda, and the approximately 125 ka Yachats marine terraces. The Yachats ter is offset about 75 m, which yields a slip rate of 0.6 mm/yr across the Yaquina Bay fault. As with other folds and faults located in the Cascadia forearc, it is unknowr coseismic displacements on these faults are always related to great megathrust earthquakes on the subduction zone, or whether some displacements are related t smaller earthquakes in the North American Plate. |
| **Name** | Faults between Yaquina Head and Yaquina Bay were first named by Ticknor (199 |

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| **comments** | #4156); from north to south, these include the Yaquina Head, Nye Beach, and Ya Bay faults. These faults have subsequently been described by Kelsey and others ( #4111) and McNeill and others (1998 #4089). The Yaquina Head and Yaquina Ba faults, collectively called the Yaquina faults herein, were originally mapped by Schlicker and others (1973 #3983) and Snavely and others (1976 #3984).<br><br>**Fault ID:** Some of these faults are included in fault number 13 of Geomatrix Consultants, Inc. (1995 #3593). |
| **County(s) and State(s)** | LINCOLN COUNTY, OREGON |
| **Physiographic province(s)** | PACIFIC BORDER |
| **Reliability of location** | Good<br>Compiled at 1:100,000 scale.<br><br>*Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to 1:62,500-scale mapping of Snavely and oth (1976 #3984). |
| **Geologic setting** | The Yaquina faults are three down-south, east-striking faults that offset marine-te sediments and wave-cut platforms between Yaquina Head and Yaquina Bay (Tick 1993 #4156; Kelsey and others, 1996 #4111). Inland, the Yaquina Head and Yaqu Bay faults offset Miocene through Eocene sedimentary rocks in the Oregon Coas Range (Schlicker and others, 1973 #3983; Snavely and others, 1976 #3984). Non these faults appear to project to offshore structures mapped in seismic-reflection profiles (Kelsey and others, 1996 #4111; McNeill and others, 1998 #4089). Goldf and others (1992 #464), Pezzopane (1993 #3544), Geomatrix Consultants, Inc. (1 #3593), and Madin and Mabey (1996 #3575) also show a short east-striking fault kilometers south of Yaquina Bay in their compilations of active faults. No documentation of this structure has been described, and detailed mapping of mari terraces in this Bay (Ticknor, 1993 #4156; Kelsey and others, 1996 #4111) appare revealed no evidence of a fault, so this fault trace is not included herein. As with folds and faults located in the Cascadia forearc, it is unknown if coseismic displacements on these faults are always related to great megathrust earthquakes subduction zone, or whether some displacements are related to smaller earthquak the North American Plate. |
| **Length (km)** | 13 km. |
| **Average strike** | N79°E |
| **Sense of** | Reverse, Left lateral |

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| **movement** | *Comments:* The Yaquina faults vertically offset marine-terrace sediments and wa platforms between Yaquina Head and Yaquina Bay (Ticknor, 1993 #4156; Kelsey others, 1996 #4111). Faults with similar attitudes are shown as reverse faults on t cross section of Schlicker and others (1973 #3983), and as normal faults on the cr section of Snavely and others (Snavely and others, 1976 #3984). Kelsey and othe (1996 #4111) concluded that most active faults along the Oregon coast are obliqu faults, with left lateral and either extensional or contractional dip slip. Geomatrix Consultants, Inc. (1995 #3593) modeled the Yaquina Bay fault as a 60° south-dip reverse fault, but such attitude is inconsistent with geologic mapping relations of Ticknor (1993 #4156) and Kelsey and others (1996 #4111). Wong and others (19 #4073; 2000 #5137) modeled the Yaquina Bay fault as a 60° north-dipping revers fault. Given the north-south orientation of maximum horizontal compression in northwestern Oregon (Werner and others, 1991 #4127), a reverse sense of slip ma most reasonable for the dip-slip component. |
| **Dip Direction** | N<br><br>*Comments:* Geomatrix Consultants, Inc. (1995 #3593) and Wong and others (199 #4073; 2000 #5137) used an estimated dip of 60° in their probabilistic seismic ha assessment associated with the Yaquina Bay fault. |
| **Paleoseismology studies** | |
| **Geomorphic expression** | The Yaquina faults are mapped on the basis of offset marine-terrace sediments an wavecut platforms (Ticknor, 1993 #4156; Kelsey and others, 1996 #4111). |
| **Age of faulted surficial deposits** | The Yaquina Head and Nye Beach faults offset the approximately 80 ka Newport marine terrace; the Yaquina Bay fault offsets the approximately 80 ka Newport, t approximately 105 ka Waconda, and the approximately 125 ka Yachats marine te (Ticknor, 1993 #4156; Kelsey and others, 1996 #4111). |
| **Historic earthquake** | |
| **Most recent prehistoric deformation** | late Quaternary (<130 ka)<br><br>*Comments:* Pezzopane (1993 #3544) and Goldfinger and others (1992 #464) sho Yaquina Bay fault as active in the Holocene or Holocene-late Pleistocene, but do discuss the evidence for this age assignment. Geomatrix Consultants, Inc. (1995 #3593), and Madin and Mabey (1996 #3575) show this structure as active in the middle and late Quaternary (<780 ka). If the faulted marine terrace platforms des by Ticknor (1993 #4156) and Kelsey and others (1996 #4111) are correlative wit approximately 80 ka, approximately 105 ka, and approximately 125 ka marine |

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| | highstands, then these faults have displacements in the late Quaternary. |
| **Recurrence interval** | |
| **Slip-rate category** | Between 0.2 and 1.0 mm/yr<br><br>*Comments:* Ticknor (1993 #4156) and Kelsey and others (1996 #4111) estimated vertical displacement rate of 0.6±0.06 mm/yr, based on measured offsets of about of the approximately 125 ka Yachats marine terrace across the projected trace of t Yaquina Bay fault. Measured offsets of 1.7 m and 1.5 m of the approximately 80 Newport marine terrace across the Nye Beach and Yaquina Head faults, respectiv yield much lower rates of displacement (Ticknor, 1993 #4156; Kelsey and others #4111). Wong and others (1999 #4073; 2000 #5137) used slip rates of 0.1–0.6 mm in their analyses of the earthquake hazards associated with the Yaquina Bay fault. |
| **Date and Compiler(s)** | 2002<br>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.<br><br>#464 Goldfinger, C., Kulm, L.D., Yeats, R.S., Mitchell, C., Weldon, R., II, Peters C., Darienzo, M., Grant, W., and Priest, G.R., 1992, Neotectonic map of the Oreg 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.<br><br>#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 Amer Bulletin, v. 108, no. 7, p. 843-860.<br><br>#3575 Madin, I.P., and Mabey, M.A., 1996, Earthquake hazard maps for Oregon: of Oregon, Department of Geology and Mineral Industries Geological Map Series GMS-100, 1 sheet.<br><br>#4089 McNeill, L.C., Goldfinger, C., Yeats, R.S., and Kulm, L.D., 1998, The effe upper pl. deformation on records of prehistoric Cascadia subduction zone earthqu *in* Stewart, I.S., and Vita-Finzi, C., eds., Coastal tectonics: Geological Society Sp Publication No. 146, p. 321-342.<br><br>#3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in Or Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.<br><br>#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
Geology and Mineral Industries, Bulletin 81, 171 p., 6 pls.

#3984 Snavely, P.D., Jr., MacLeod, N.S., Wagner, H.C., and Rau, W.W., 1976,
Geologic map of the Yaquina and Toledo quadrangles, Lincoln County, Oregon:
Geological Survey Miscellaneous Investigations Map I-867, 1 sheet, scale 1:62,5

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

#4127 Werner, K.S., Graven, E.P., Berkman, T.A., and Parker, M.J., 1991, Directi
maximum horizontal compression in western Oregon determined by borehole
breakouts: Tectonics, v. 10, no. 5, p. 948-958.

#4073 Wong, I., Silva, W., Bott, J., Wright, D., Thomas, P., Gregor, N., Li, S., Ma
M., Sojourner, A., and Wang, Y., 1999, Earthquake scenario and probabilistic gro
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., Ma
M., Sojourner, A., and Wang, Y., 2000, Earthquake scenario and probabilistic gro
shaking maps for the Portland, Oregon, metropolitan area: State of Oregon,
Department of Geology and Mineral Industries Interpretive Map Series IMS-16,
pamphlet, scale 1:62,500.