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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.

unnamed fault zone near and offshore of Raft River (Class A) No. 583

Last Review Date: 2003-09-03

citation for this record: **McCrory, P.A., compiler, 2003, Fault number 583, unnamed fault zone near and offshore of Raft River, 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 03:04 PM.**

Synopsis	The unnamed fault zone near and offshore of Raft River is a 2-km-wide zone of reverse faults (McCrory, 1997 #6323; McCrory and others, 2002 #5864). The fault zone consists of shorter discontinuous traces that together form a zone at least 10 kilometers long. Mapped faults and anticlinal folds to the north may be a continuation of this fault zone (McCrory and others, 2002 #5864), but available data are not sufficient to establish such a connection. This fault zone is north of a broad convergent zone associated with a major forearc block boundary. In this region, late Cenozoic structures trend sub-parallel to the continental slope, consistent with contraction related to subduction (McCrory and others, 2002 #5864). The onshore strands displace late Quaternary marine-terrace deposits (McCrory, 1997 #6323; McCrory and others, 2002 #5864). An offshore trace offsets the seafloor and deforms pre-Quaternary strata exposed on the

	seafloor. No Quaternary seafloor deposits are observed on available seismic reflection profiles, so potential younger fault activity cannot be evaluated offshore.
Name comments	Wolf and others (1997 #6305) first mapped offshore fault strands of this unnamed fault zone near and offshore of Raft River, based on sparse seismic reflection data collected by the USGS and University of Washington on 2 cruises in 1967 and 1977. McCrory and others (2002 #5864) substantially revised the orientation and location of the fault strands and related anticlinal folds based on new USGS high-resolution seismic reflection data (Foster and others, 1999 #6317; Foster and others, 1999 #6318; Foster and others, 2001 #6319) and sidescan-sonar data (McCrory and others, 2003 #6324; McCrory and others, in press #6325) collected in 1997 and 1998. The location and interpretation of recent activity on late Cenozoic faults previously mapped in the offshore area (Grim and Bennett, 1969 #6320; Wagner and others, 1986 #5670) have been superceded by these more recent publications (McCrory and others, 2002 #5864). McCrory (1997 #6323) first noted and mapped the onshore fault strands. North-northwest-striking, onshore fault strands of this zone occur directly north and south of Raft River. Two offshore strands extend to the north-northwest from near the mouth of Raft River; Quaternary activity along the western offshore strand has not been documented.
County(s) and State(s)	GRAYS HARBOR COUNTY, WASHINGTON
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:250,000 scale. *Comments:* The fault-trace locations are based on mapping of McCrory and others (2002 #5864) from seismic reflection profiles with a 5-km spacing. At least one of these traces extends onshore (McCrory, 1996 #6321; McCrory, 1997 #6323). The northwestward extent of this unnamed fault zone, and possible connection with mapped faults to the north (included in the unnamed fault set offshore of Queets River [#582]) cannot be resolved with available data.
Geologic setting	North of Cape Elizabeth, structures shift progressively from an

	east-northeast orientation to a north-northwest orientation across a 6-km-wide area. North-northwest-striking faults of the unnamed fault zone near and offshore of Raft River, occur north of that shift in orientations. North-northwest-striking faults on the continental shelf north of the Raft River generally do not project onshore; rather, they tend to lie offshore subparallel to the coastline. The north-northwest orientation of structures in this region is consistent with subduction-related contraction, perhaps driven by interplate coupling far from the deformation front (McCrory and others, 2002 #5864). Some faults of this zone and some faults to the north and south show evidence of ongoing contraction, disrupt the late Pleistocene erosional unconformity, and offset the seafloor. Some of these faults also elevate Neogene bedrock to the seafloor. For example, a fault about 20 kilometers west of the Queets River (plate 2I, shot point 9000 in McCrory and others, 2002 #5864) disrupts the seafloor and underpins local bedrock outcrops along the seafloor. Where north-northwest-striking faults of this region extend onshore, such as those in this fault zone, they displace late Quaternary marine-terrace deposits (McCrory, 1996 #6321; McCrory and others, 2002 #5864) along thrust and reverse faults that have offsets of as much as 0.5-m, with cumulative offsets up to 2 m. Faulted deposits exposed in sea cliffs along onshore strands of this fault zone are as young as 37 ka (McCrory and others, 1996 #6322) based on radiocarbon dating.
Length (km)	11 km.
Average strike	N21°W
Sense of movement	Thrust *Comments:* Onshore fault strands are mapped as down-to-the-southwest, northeast-dipping thrust faults (McCrory and others, 2002 #5864). Offshore fault strands are inferred to be thrust or reverse faults based on their association with the onshore thrust faults and with anticlines mapped offshore.
Dip	<45? *Comments:* Onshore fault strands are mapped as down-to-the-southwest, northeast-dipping thrust faults (McCrory and others, 2002 #5864); dip angles are not specified for these onshore fault strands, but they dip to the northeast probably at low-moderate angles. Offshore strands are inferred to be thrust or reverse faults

	based on their association with the onshore thrust faults and with anticlines mapped offshore and they may also have low- to moderate-angle dips (<45?). The vertical exaggeration of seismic reflection data, however, precludes accurate determination of fault dip (all strands with dips >30? appear to have vertical dips).
Paleoseismology studies	
Geomorphic expression	Offshore fault strand and associated anticline deform the seafloor (McCrory, 1996 #6321)
Age of faulted surficial deposits	late Quaternary marine-terrace deposits (<37 ka) are offset along the southern onshore fault strand (McCrory and others, 1996 #6322)
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Late Quaternary marine-terrace deposits (<37 ka) are offset along the southern strand of the fault zone onshore (McCrory and others, 1996 #6322).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* At this time, no information has been reported on rates of slip for these faults. Based mostly on this lack of information, a conservative rate of <0.2 mm/yr is tentatively assigned herein.
Date and Compiler(s)	2003 Patricia A. McCrory, U.S. Geological Survey
References	#6319 Foster, D.S., McCrory, P.A., and O'Brien, T.F., 2001, Archive of boomer subbottom data collected during USGS cruise MCAR 97013 (M1-97-WO) Washington shelf, 7-14 July, 1997: U.S. Geological Survey Open-File Report 01-048, 3 CD-ROM set. #6317 Foster, D.S., McCrory, P.A., Danforth, W.W., and O?Brien, T.J., 1999, Archive of chirp subbottom data collected during USGS cruise MCAR 98008 (M3-98-WO) Washington shelf, 24

June-5 July, 1998: U.S. Geological Survey Open-File Report 99-591, 2 CD-ROM set.

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#6321 McCrory, P.A., 1996, Tectonic model explaining divergent contraction directions along the Cascadia margin, Washington: Geology, v. 24, p. 929-932.

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#6322 McCrory, P.A., Wilson, D.S., and Murray, M.H., 1996, Crustal deformation at the leading edge of the Siletz terrane, coastal Washington [abs.]: Eos, Transactions of the American Geophysical Union, v. 77, no. 46, p. 669.

	#5670 Wagner, H.C., Batatian, L.D., Lambert, T.M., and Tomson, J.H., 1986, Preliminary geologic framework studies showing bathymetry, locations of geophysical tracklines and exploratory wells, sea-floor geology and deeper geologic structures, magnetic contours, and inferred thickness of Tertiary rocks on the continental shelf and upper continental slope off southwestern Washington between latitudes 46° N and 48°30'N and from the Washington coast to 125°20'W: Washington State Department of Natural Resources Open-File Report 86-1, 8 p., 6, scale 1:250,000. #6305 Wolf, S.C., Hamer, M.R., and McCrory, P.A., 1997, Quaternary geologic investigations on the inner shelf offshore northern Oregon-southern Washington: U.S. Geological Survey Open-File Report 97-677, 4 sheets, scale 1:500,000.