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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 offshore of Cape Shoalwater (Class A) No. 591

Last Review Date: 2003-07-03

citation for this record: **McCrory, P.A., compiler, 2003, Fault number 591, unnamed fault zone offshore of Cape Shoalwater, 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 offshore of Cape Shoalwater is a small zone, only about 1.5-km wide and 6-km long. Available single-channel, seismic reflection data suggest that one strand offsets a late Quaternary erosional surface beneath the continental shelf. The two mapped traces are short, and not considered seismogenic unless they continue southeastward to connect with the Willapa Bay fault zone [#592]. The regional tectonic setting favors reverse or transpressional motion on these faults, however to date only dip-slip displacement has been documented.
Name comments	McCrory and others (2002 #5864) first recognized and mapped the unnamed fault zone offshore of Cape Shoalwater, based primarily on USGS seismic reflection profiles collected in 1997 (Cross and others, 1998 #6303). Two mapped fault traces define

	this short, northwest-trending fault zone that is located west of Cape Shoalwater.
County(s) and State(s)	PACIFIC COUNTY, WASHINGTON (offshore)
Physiographic province(s)	PACIFIC BORDER (offshore)
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 5-km spacing. This study used high-resolution seismic reflection data to map the location of offset stratigraphic reflectors.
Geologic setting	The unnamed fault zone offshore of Cape Shoalwater is situated a few kilometers from a major forearc block boundary that is expected to accommodate modest relative motion (d8 mm/y) (Mazzotti and others, 2002 #6304). The orientation of the fault traces with respect to the block boundary, favors transpressional motion (See also, discussion in "Geologic setting" of Willapa Bay fault zone [#592]). If these short strands continue southeastward to connect with the Willapa Bay fault zone, then they are part of a much longer (>47-km-long) fault zone. Available seismic reflection profiles do not image strata deeper than about 150 m below the seafloor, so offset of deeper reflectors and older units has not been assessed.
Length (km)	6 km.
Average strike	N54°W
Sense of movement	Thrust *Comments:* Dip-slip offset is depicted in seismic reflection profiles; strike-slip offset, if any, is not resolvable with available data (Cross and others, 1998 #6303; McCrory and others, 2002 #5864). These faults are inferred to be, at least in part, reverse faults based on their apparent dip-slip offsets and their association with offshore anticlines or with thrust and reverse faults and anticlines mapped onshore. The tectonic setting of this region, however, suggests that these faults might also have components of strike-slip (McCrory and others, 2002 #5864). The actual fault

	planes of these offshore faults, however, cannot be resolved with available seismic reflection data.
Dip Direction	NE; SW *Comments:* The southern strand vertically displaces seismic stratigraphic reflectors southwest side down; the northern strand displaces reflectors northeast side down to define an uplifted ridge (McCrory and others, 2002 #5864). These two offshore fault strands are inferred to be, at least in part, reverse faults that dip to the northeast and southwest, respectively, perhaps at moderate to steep angles if these faults also have components of strike-slip. 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	
Age of faulted surficial deposits	Seafloor deposits are not faulted. Both fault strands offset or deform seismic stratigraphic reflectors beneath the seafloor. Stratigraphic reflectors deformed by the northern strand are inferred to mark Quaternary units, whereas the age of reflectors deformed by the southern strand has not been specified.
Historic earthquake	
Most recent prehistoric deformation	undifferentiated Quaternary (<1.6 Ma) *Comments:* Based on inferred ages of deformed units depicted in seismic reflection data, McCrory and others (Plate 2H 2002 #5864) assigned the northern strand of this fault zone a Quaternary (<1.8 Ma) age for the time of the most recent prehistoric faulting event. They did not assign an age to the southern strand. These age assignments are retained herein, with the exception that the limiting age used for the Quaternary is <1.6 Ma.
Recurrence interval	
Slip-rate	Less than 0.2 mm/yr

category	*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	#6303 Cross, V.A., Twichell, D.C., Parolski, K.F., and Harrison, S.E., 1998, Archive of boomer seismic-reflection data collected aboard RV CORLISS cruise CRLS97007 off Northern Oregon and Southern Washington inner continental shelf: U.S. Geological Survey Open-File Report 98-351, 2 CD-ROM set. #6304 Mazzotti, S., Dragert, H., Hyndman, R.D., Miller, M.M., and Henton, J.A., 2002, GPS deformation in a region of high crustal seismicity—N. Cascadia forearc: Earth and Planetary Science Letters, v. 198, p. 41-48. #5864 McCrory, P.A., Foster, D.S., Danforth, W.W., and Hamer, M.R., 2002, Crustal deformation at the leading edge of the Oregon Coast Range block, offshore Washington (Columbia River to Hoh River): U.S. Geological Survey Professional Paper 1661-A, 47 p., 2 pls.