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.

Heceta Bank structure (Class A) No. 795

Last Review Date: 2002-05-17

citation for this record: **Personius, S.F., compiler, 2002, Fault number 795, Heceta Bank structure, 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 Heceta Bank structure deforms accretionary wedge sediments that underlie the continental slope in the forearc of the Cascadia subduction zone [781]. The structure is mapped as a very linear scarp that abruptly truncates the southern margin of Heceta Bank, and appears to tilt and offset >200 m a submerged, late Pleistocene sea-level lowstand shoreline that fringes the bank. The Heceta Bank structure was originally mapped as a left-lateral strike slip fault, but subsequent studies revealed little evidence of surface faulting, so the structure may be a monocline overlying a buried fault. Deformation of the late Pleistocene shoreline indicates 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 structure 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 Heceta Bank structure was originally mapped and included in the Heceta South fault [796] by Goldfinger and others (1992 #464) and Goldfinger (1994 #3972). Goldfinger and others (1997 #4090) used subsequent data to delineate and name the Heceta Bank structure as a separate structure. **Fault ID:** The structure is included in fault number 4 of Geomatrix Consultants, Inc. (1995 #3593).
County(s) and State(s)	LANE COUNTY, OREGON (offshore) DOUGLAS 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 Heceta Bank structure deforms accretionary wedge sediments that underlie the continental slope in the forearc of the Cascadia subduction zone [781] (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 structure 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)	18 km.
Average strike	N58°W
Sense of movement	Monocline, Left lateral *Comments:* The Heceta Bank structure was originally mapped as a left-lateral strike slip fault (Goldfinger and others, 1992 #464; Goldfinger, 1994 #3972), but subsequent studies revealed little evidence of surface faulting, so the structure may be a monocline

	overlying a buried fault (Goldfinger and others, 1997 #4090).
Dip Direction	SW
Paleoseismology studies	
Geomorphic expression	The Heceta Bank structure is mapped as a very linear scarp that abruptly truncates the southern margin of Heceta Bank, and appears to tilt and offset a submerged shoreline that fringes the bank (Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090).
Age of faulted surficial deposits	The Heceta Bank structure appears to tilt and offset a submerged, late Pleistocene sea-level lowstand shoreline that fringes the bank (Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* The Heceta Bank structure appears to tilt a submerged, late Pleistocene sea-level lowstand shoreline that fringes Heceta Bank (Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090), so latest deformation must have occurred in the late Pleistocene or Holocene. The structure 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 horizontal slip rates has been collected (Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090), but Goldfinger (1994 #3972) included this structure in the Heceta South fault [796] and used slip rates from similar faults to estimate a slip rate of 5.5 mm/yr. Goldfinger and others (Goldfinger and others, 1997 #4090) estimated >200 m of vertical displacement of a submerged late Pleistocene shoreline across the structure.
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. #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.

Questions or comments?

Facebook Twitter Google Email
Hazards
Design Ground MotionsSeismic Hazard Maps & Site-Specific DataFaultsScenarios