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Quaternary Fault and Fold Database of the United States

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South Slough thrust and reverse faults (Class A) No. 890

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Synopsis	Numerous north-striking thrust and reverse faults associated with the South Sloug syncline were formed during ongoing east-west compression in the forearc of the Cascadia subduction zone [781]. The faults and associated folds are an onshore extension of a broad fold and thrust belt that is actively deforming the accretionar wedge offshore [784]. Many of these faults are parallel to bedding attitudes in the limb of the South Slough syncline and thus are bedding plane (flexural-slip) fault these structures may not be seismogenic, but rather move in tandem with coseism deformation related to folding. Other north-striking reverse and thrust faults have strikes and dips that are somewhat discordant with bedding attitudes in the axis ar east limb of the South Slough; the structural relationship between these latter faul folding in the syncline is unknown. Most of these faults offset middle and late Quaternary marine terrace deposits and platforms, and at least one appears to hav been active in the Holocene. As with other folds and faults located in the Cascadi forearc, it is unknown if coseismic displacements on these structures are always r to great megathrust earthquakes on the subduction zone, or whether some

	displacements are related to smaller earthquakes in the North American plate.
Name comments	Numerous north-striking thrust and reverse faults have been mapped and named i vicinity of the South Slough syncline [891]. Named faults include the Barview or Barview-Empire, Bastendorff, Charleston, Coos Head, Crown Point, Hayward Cr Miner Creek, Westside, Winchester, and Yoakum Point faults (McInelly and Kels 1990 #4102; Black and Madin, 1995 #4157; Madin and others, 1995 #4158). **Fault ID:** Some of these faults are included in fault number 39 of Pezzopane (19 #3544), and fault number 15 of Geomatrix Consultants, Inc. (1995 #3593).
County(s) and State(s)	COOS COUNTY, OREGON
Physiographic province(s)	PACIFIC BORDER
Reliability of location	Good Compiled at 1:24,000 scale. *Comments:* Location of fault from ORActiveFaults (http://www.oregongeology.org/arcgis/rest/services/Public/ORActiveFaults/MapS downloaded 06/02/2016) attributed to 1:24,000-scale mapping of Madin and othe (1995 #4158) and Black and Madin (1995 #4157).
Geologic setting	The numerous north-striking thrust and reverse faults included in this group of fa were formed during ongoing east-west compression in the forearc of the Cascadia subduction zone in the central Oregon Coast Range (McInelly and Kelsey, 1990 #4102; Black and Madin, 1995 #4157; Madin and others, 1995 #4158). The fault associated folds are an onshore extension of a broad fold and thrust belt that is ac deforming the accretionary wedge offshore [784] (Goldfinger and others, 1992 #4 Nelson and Personius, 1996 #4128; McNeill and others, 1998 #4089). Many of th reverse faults, such as the Bastendorff, Coos Head, Hayward Creek, Miner Creek Yoakum Point faults, are parallel to bedding attitudes in the west limb of the Sout Slough syncline (Baldwin, 1966 #4122; Adams, 1984 #4120; McInelly and Kelse 1990 #4102; Madin and others, 1995 #4158). These bedding plane (flexural-slip) may not be seismogenic, but rather move in tandem with coseismic deformation related to folding (Yeats and others, 1981 #4132; Yeats, 1986 #4159). Other north striking reverse and thrust faults, such as the Barview, Charleston, Crown Point, Westside, and Winchester faults, have strikes and dips that are somewhat discorda with bedding attitudes in the axis and east limb of the South Slough syncline (Mc and Kelsey, 1990 #4102; Black and Madin, 1995 #4157; Madin and others, 1995 #4158). The structural relationship between these latter faults and folding in the syncline is unknown. As with other folds and faults located in the Cascadia forea is unknown if coseismic displacements on these structures are always related to g

	megathrust earthquakes on the subduction zone, or whether some displacements a related to smaller earthquakes in the North American plate.
Length (km)	16 km.
Average strike	N8°E
Sense of movement	Reverse *Comments:* These faults are mapped as north-striking thrust and reverse faults (McInelly and Kelsey, 1990 #4102; Black and Madin, 1995 #4157; Madin and ot 1995 #4158). Many of the reverse faults are parallel to bedding attitudes and thus bedding plane (flexural-slip) faults. Other north-striking reverse and thrust faults strikes and dips that are somewhat discordant with bedding attitudes of the South Slough syncline; the structural relationship between these latter faults and folding the syncline is unknown.
Dip Direction	E; W *Comments:* McInelly and Kelsey (1990 #4102) and Madin and others (1995 #415
Paleoseismology studies	Madin and others (1995 #4158) excavated trenches across the southern end of the Winchester fault near Cox Canyon. The trench logs have not been published, so t following description is from Madin and others (1995 #4158) and I.P. Madin (per commun., 2000). Cox Canyon site (890-1). Three trenches were excavated across an 8-m-high scar marine-terrace platform south of Cox Canyon in 1993. The trenches exposed at le two major thrust faults dipping 17–20° west, that thrust Eocene bedrock over folc faulted, and overturned marine sediments of the >200 ka Metcalf marine terrace. least two colluvial deposits were offset, indicating three or more surface-faulting events since deposition of the marine-terrace sediments. Carbon from both colluv deposits yielded infinite radiocarbon ages (>47,800 yr BP. and >52,800 yr BP). C from a 1-m-thick post-faulting colluvial and soil deposit overlying the fault yielde radiocarbon age of about 9,590 yr BP, indicating the latest event is pre-Holocene age.
Geomorphic expression	The numerous north-striking thrust and reverse faults included in this group of fa warp, offset, and form fault scarps on marine terraces, wave-cut platforms, and estuarine deposits in the vicinity of South Slough (Baldwin, 1966 #4122; McInell Kelsey, 1990 #4102; Black and Madin, 1995 #4157; Madin and others, 1995 #41:
Age of faulted surficial	Most of these faults offset the Whisky Run, Pioneer, Seven Devils, and/or Metcal marine terraces; these terraces have assigned ages of about 80, 105, 125, and grea

deposits	than or equal to 200 ka, respectively (McInelly and Kelsey, 1990 #4102; Madin a others, 1995 #4158; Kelsey and others, 1996 #4111).
Historic earthquake	
Most recent prehistoric deformation	latest Quaternary (<15 ka) *Comments:* If the faulted marine terrace sediments and platforms mapped by McI and Kelsey (McInelly and Kelsey, 1990 #4102) and Madin and others (1995 #41: are correlative with 80, 105, 125, and greater than or equal to 200 ka marine highstands, then most of these faults have displacements in the late Quaternary. Drowned tree stumps in the footwall of the Barview fault yielded late Holocene radiocarbon ages (McInelly and Kelsey, 1990 #4102), so at least one of these faul may have been active in the Holocene. Pezzopane (1993 #3544), Goldfinger and (1992 #464), Geomatrix Consultants, Inc. (1995 #3593), and Madin and Mabey (#3575) show faults in the vicinity of South Slough as active in the Holocene or la Pleistocene (<20 ka).
Recurrence interval	
Slip-rate category	Less than 0.2 mm/yr *Comments:* A few reverse and thrust faults in the vicinity of South Slough have published slip data in marine-terrace deposits. Bedding plane faults such as the Yoakum Point, Miner Creek, and Bastendorff Beach faults offset the 80 ka Whisk Run terrace 4–5 m, the 125 ka Seven Devils terrace as much as 12 m, and the gre than or equal to 200 ka Metcalf terrace 6–25 m (Baldwin, 1966 #4122; McInelly Kelsey, 1990 #4102). The Charleston fault offsets the 105-ka Pioneer terrace 19 r may offset the 80 ka Whisky Run terrace a similar amount (McInelly and Kelsey, #4102). Madin and others (1995 #4158) measured a vertical offset of 50 m of the greater than or equal to 200 ka Metcalf terrace across the Winchester fault, and calculated an actual offset of 146 m, based on projection of the fault in the subsur these data yield a maximum deformation rate of 0.73 mm/yr (Madin and others, 1 #4158), for perhaps the highest-slip fault in this group.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
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