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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.

Bald Mountain-Big Lagoon fault zone (Class A) No. 787

Last Review Date: 2002-04-19

citation for this record: **Personius, S.F., compiler, 2002, Fault number 787, Bald Mountain-Big Lagoon fault zone, 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 north-northwest-striking, thrust or reverse Bald Mountain-Big Lagoon fault zone is one of numerous structures in a fold and thrust belt [784] that deforms sediment underlying the continental slope and shelf in the forearc of the Cascadia subduction zone [781] in offshore northern California and southern Oregon. The Bald Mountain-Big Lagoon fault zone may form the boundary between Cretaceous and Jurassic rocks of the Central belt of the Franciscan Complex and Tertiary and Cretaceous rocks of the Coastal belt of the Franciscan Complex. Deformation of Quaternary sediment onshore and offsets of upper Quaternary sediment apparent in seismic reflection profiles offshore indicate most recent movement in the late Quaternary. However, as with other folds and faults located in the Cascadia forearc, it is unknown if coseismic displacements on this fault zone 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 America Plate.
Name comments	The Bald Mountain-Big Lagoon fault zone includes the Bald Mountain and Big Lagoon faults, which are mapped onshore in northern California (Kelsey and Carver, 1988 #4094). The northern end of the fault zone extends into offshore Oregon (Goldfinger and others, 1992 #464). **Fault ID:** This structure is fault number 40 of Pezzopane (1993 #3544) and fault number 11 of Geomatrix Consultants, Inc, (1995 #3593).
County(s) and State(s)	DEL NORTE COUNTY, CALIFORNIA (offshore) CURRY COUNTY, OREGON (offshore)
Physiographic province(s)	PACIFIC BORDER (offshore)
Reliability of location	Poor Compiled at 1:500,000 scale. *Comments:* The fault trace in Oregon is from 1:500,000-scale mapping of Goldfinger and others (1992 #464).
Geologic setting	The north-northwest-striking, thrust or reverse Bald Mountain-Big Lagoon fault zone is one of numerous structures in a fold and thrust belt [784] that deforms sediment underlying the continental slope and shelf in the forearc of the Cascadia subduction zone [781] in offshore northern California and southern Oregon [784] (Goldfinger and others, 1992 #464; Clarke and Carver, 1992 #4091; Clarke, 1992 #4092). In northernmost offshore California and southern Oregon, Clarke (1992 #4092) interprets the Bald Mountain-Big Lagoon fault zone as the boundary between Cretaceous and Jurassic rocks of the Central belt of the Franciscan Complex in the hanging wall, and Tertiary and Cretaceous rocks of the Coastal belt of the Franciscan Complex in the foot wall. As with other folds and faults located in the Cascadia forearc, it is unknown if coseismic displacements on this fault 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 America Plate (Goldfinger and others, 1992 #446; Goldfinger, 1994 #3972; Goldfinger and others, 1997 #4090; McNeill and others, 1998 #4089).

Length (km)	95 km.
Average strike	N27°W
Sense of movement	Thrust *Comments:* The Bald Mountain-Big Lagoon fault zone has been described as a right-lateral strike-slip fault (Cashman and others, 1986 #4095; Clarke, 1987 #4087; Kelsey and Carver, 1988 #4094), but most recent data indicates the structure is an east-dipping thrust or reverse fault zone (Clarke, 1990 #4143; Goldfinger and others, 1992 #464; Clarke, 1992 #4092; Geomatrix Consultants Inc., 1995 #3593).
Dip Direction	E
Paleoseismology studies	
Geomorphic expression	The Bald Mountain-Big Lagoon fault zone is mapped in seismic reflection profiles as multiple fault strands and anticlinal axes in Jurassic through upper Quaternary sediment on the upper slope and continental shelf (Clarke, 1990 #4143; Goldfinger and others, 1992 #464; Clarke, 1992 #4092; Geomatrix Consultants Inc., 1995 #3593). In onshore northern California, the Big Lagoon fault offsets and folds Quaternary sediment near Big Lagoon, but no evidence of faulting in Quaternary deposits has been described along the Bald Mountain fault (Kelsey and Carver, 1988 #4094).
Age of faulted surficial deposits	The Bald Mountain-Big Lagoon fault zone is mapped in seismic reflection profiles as offsetting upper Quaternary sediment on the upper slope and continental shelf; these sediments are equivalent in age to onshore deposits that postdate the Pliocene to the late Pleistocene Wildcat Group (Clarke, 1992 #4092).
Historic earthquake	
Most recent prehistoric deformation	late Quaternary (<130 ka) *Comments:* Offset of post-late Pleistocene sediment on the continental slope and shelf (Clarke, 1992 #4092) suggests most recent movement in the late Quaternary. The fault is mapped as active in the Holocene or late Pleistocene by Goldfinger and others (1992 #464), and in the middle and late Quaternary (<700-780 k.y.) by Pezzopane (1993 #3544), Geomatrix Consultants,

	Inc, (1995 #3593), and Madin and Mabey (1996 #3575).
Recurrence interval	
Slip-rate category	Between 0.2 and 1.0 mm/yr *Comments:* No data on slip rates have been published, but Geomatrix Consultants, Inc, (1995 #3593) used estimated slip rates of 0.01-1.0 mm/yr in their analysis of earthquake hazards associated with the Bald Mountain-Big Lagoon fault zone.
Date and Compiler(s)	2002 Stephen F. Personius, U.S. Geological Survey
References	#4095 Cashman, S.M., Cashman, P.H., and Longshore, J.D., 1986, Deformational history and regional tectonic significance of the Redwood Creek schist, northwestern California: Geological Society of America Bulletin, v. 97, p. 35-47. #4087 Clarke, S.H., Jr., 1987, Chapter 15-Geology of the California continental margin north of Cape Mendocino, *in* Scholl, D.W., Grantz, A., and Vedder, J.G., eds., Geology and resource potential of the continental margin of Western North America and adjacent ocean basins—Beaufort Sea to Baja, California: Circum-Pacific Council for Energy and Mineral Resources Earth Science Series, v. 6, p. 337-351. #4143 Clarke, S.H., Jr., 1990, Map showing geologic structures of the northern California continental margin: U.S. Geological Survey Miscellaneous Field Studies Map MF-2130, 1 sheet, scale 1:250,000. #4092 Clarke, S.H., Jr., 1992, Geology of the Eel River Basin and adjacent region—Implications for Late Cenozoic tectonics of the southern Cascadian subduction zone and Mendocino Triple Junction: The America Association of Petroleum Geologists Bulletin, v. 76, no. 2, p. 199–224. #4091 Clarke, S.H., Jr., and Carver, G.A., 1992, Late Holocene tectonics and paleoseismicity, southern Cascadia subduction zone: Science, v. 255, p. 188-192. #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.

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#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.

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#4094 Kelsey, H.M., and Carver, G.A., 1988, Late Neogene and Quaternary tectonics associated with northward growth of the San Andreas transform fault, northern California: Journal of Geophysical Research, v. 93, no. B5, p. 4797–4819.

#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.

#3544 Pezzopane, S.K., 1993, Active faults and earthquake ground motions in Oregon: Eugene, Oregon, University of Oregon, unpublished Ph.D. dissertation, 208 p.