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Tsunami Hazard Map of the Siletz Bay Area, Lincoln County, Oregon

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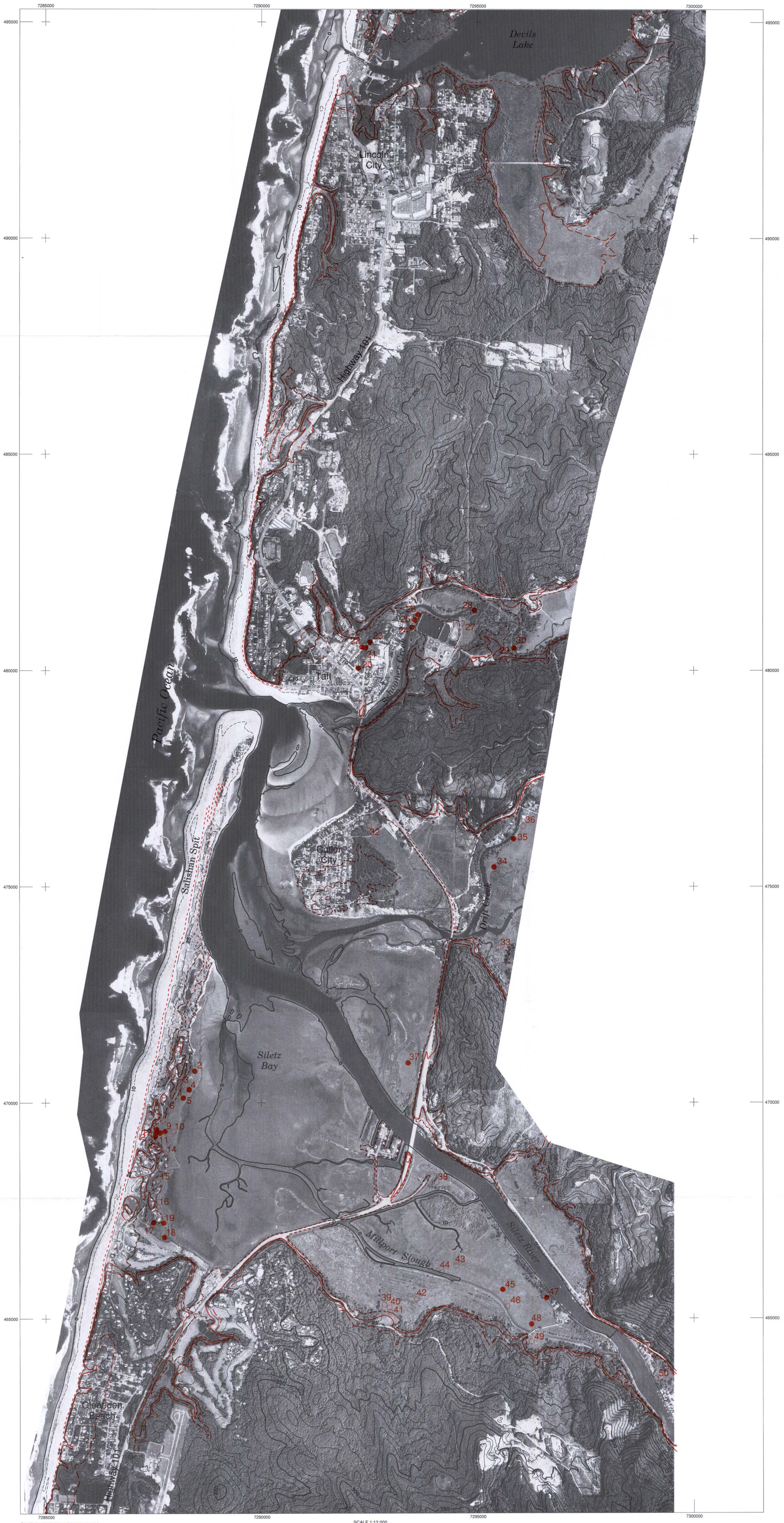
Lincoln County, Oregon

By G. R. Priest and others



MAP SYMBOLS

- Boundary line between areas of extreme and high risk from tsunami flooding. (Scenario 1 of Priest, 1995b)[1]
- Boundary line between areas of high and moderate risk from tsunami flooding. (Scenario 2 of Priest, 1995b). This line was adopted to implement Oregon Revised Statutes 455.446 and 455.447[2]
- Boundary line between areas of moderate and low risk from tsunami flooding. (Scenario 3 of Priest, 1995b)
- ○ 46 Core site with buried soils; no tsunami sand layers; database label[3]
- ● 45 Core site with buried soils; one or more tsunami sand layers; database label[3]

[1]This boundary line may not be the highest possible run-up. Tsunamis under very unusual conditions can reach as high as 100 feet at the open coast. It is not known whether waves could reach that high in the Siletz Bay area, but evacuating to areas above 100 feet in elevation will reduce risk to near zero.
[2]This boundary was adopted to implement Oregon Revised Statutes ORS 455.446 and 455.447, which limit construction of essential and special occupancy buildings in tsunami inundation zones. Any differences between this line and the same line on smaller scale maps is due to scale, not actual differences in location. Explanation of the methodology used to develop the line adopted to implement ORS 455.446 and 455.447 appears in DOGAMI Open-File Report O-95-67 (Priest, 1995a).
[3]Data from core sites are available as part of DOGAMI Open-File Report O-95-05 (Peterson and others, 1995).

Map prepared by George R. Priest, Oregon Department of Geology and Mineral Industries (DOGAMI), from numerical simulations of Ming Qi and António M. Baptista, Oregon Graduate Institute of Science & Technology; and from core data of Curt D. Peterson and Mark E. Darienzo, Portland State University

How to Use the Map: Mapped boundary lines may be viewed as guides for evacuation planning in the event of an earthquake and tsunami. ***If you feel an earthquake with 20 seconds or more of strong ground shaking, immediately head inland or to high ground***. As illustrated in Figure 1, ***if the earthquake has generated a tsunami, water will begin to rise immediately after the earthquake, and dangerous wave activity will continue for a period of several hours. Therefore, do not go back to the shoreline until an official "all clear" is issued***.

Mapped boundary lines on this map were developed by a combination of geologic analysis and computer modeling. The methodology and three scenarios developed as part of the modeling are described in the Oregon Department of Geology and Mineral Industries (DOGAMI) Open-File Report O-95-05 (Priest and others, 1995a; Baptista and others, 1995).

SILETZ BAY AREA - GENERALIZED TIME HISTORY

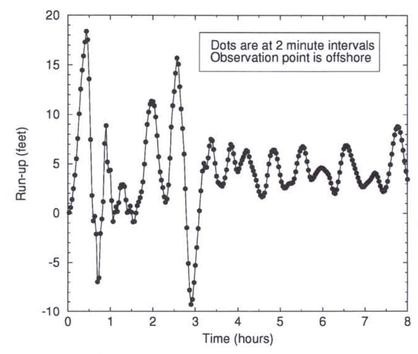


Figure 1. Time history for tsunami run-up at a point immediately offshore of the Taft area. Because the point is offshore, the vertical axis does not directly predict run-up at the shoreline. The figure is given to show the general pattern of wave activity, not absolute run-up elevation. Figure 1 was taken from a preliminary simulation by Priest (1995a) using earthquake-induced bottom deformation inferred from data of Hyndman and Wang (1993).

The distribution of tsunami sand layers found at the mapped core sites is most consistent with open coastal tsunami run-up predicted by Scenario 2 of Open-File Report 0-95-05 (Priest and others, 1995a). This line is considered the most appropriate line for evacuation planning, but for maximum safety people should be encouraged to get to areas as high and as far inland as possible. Planners of evacuation routes and destinations should consult the earthquake hazard maps of the Siletz Bay area (Wang and Priest, 1995) to make sure that these evacuation areas are not compromised by liquefaction or earthquake-induced landslides. Bridges may fail in the event of an earthquake. Consult with government transportation authorities about the seismic stability of bridges used for evacuation.

Additional Detailed Information: See Oregon Department of Geology and Mineral Industries Open-File Report O-95-05 (Priest, 1995b) for a summary of the mapping procedure (Priest and others, 1995a), an explanation of the numerical simulation of the tsunamis (Baptista and others, 1995), and data from core sites (Peterson and others, 1995). See Open-File Report O-95-06 (Priest and others, 1995b) (library access only) for a draft version of the map depicted as three maps at a scale of 1:4,800. The 1:4,800-scale maps have elevation contours at intervals of 5 feet, except in areas of steep slopes or insufficient data.

Funding Sources: Funds for the project were provided in part from the Oregon Coastal Management Program, Oregon Department of Land Conservation and Development, from funds provided by the Oregon Legislature, U.S. Department of Commerce National Oceanographic and Atmospheric Administration office of Coastal Resource Management under Section 306 Coastal Zone Management grants, and Section 309 Program Enhancement grants. The project was also funded from State of Oregon Lottery, State of Oregon General Fund, donated in-kind support from the Oregon Graduate Institute of Science & Technology, and the Oregon State University Extension Sea Grant College Program under grant number NA36RG0451.R/CP.

References:

Baptista, A. M., Qi, M., and Myers, E.P., III, 1995, Siletz Bay: A pilot investigation of coastal inundation by Cascadia Subduction Zone tsunamis, *in* Priest, G.R., ed., 1995, Explanation of mapping methods and use of the tsunami hazard map of the Siletz Bay area, Lincoln County, Oregon: Oregon Department of Geology and Mineral Industries Open-File Report O-95-05, p. 21-44.

Hyndman, R.D., and Wang, K., 1993, Thermal constraints on the zone of a major thrust earthquake failure: the Cascadia subduction zone: Journal of Geophysical Research, v. 98, no. b2, p. 2039-2060.

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Priest, G.R., Baptista, A.M., Qi, M., Peterson, C.D., and Darienzo, M.E., 1995a, Simplified explanation of the tsunami hazard map of the Siletz Bay area, Lincoln County, Oregon, *in* Priest, G.R., ed., 1995, Explanation of mapping methods and use of the tsunami hazard map of the Siletz Bay area, Lincoln County, Oregon: Oregon Department of Geology and Mineral Industries Open-File Report O-95-05, p. 1-20.

Priest, G.R., Qi, M., Baptista, A. M., Peterson, C.D., and Darienzo, M.E., 1995b, Large-scale tsunami hazard maps of the Siletz Bay area, Lincoln County, Oregon: Oregon Department of Geology and Mineral Industries Open-File Report O-95-06, scale 1:4,800 (library access copy available only in the DOGAMI library, Suite 965, 800 NE Oregon Street, Portland, OR 97232).

Wang, Y., and Priest, G.R. 1995, Relative hazard maps of the Siletz Bay area, coastal Lincoln County, Oregon: Oregon Department of Geology and Mineral Industries, Geological Map Series GMS-93.

Rectified orthophotograph base prepared from 1994 1:15,000 aerial photography taken by Spencer B. Gross, Inc.

Projection and 5,000-foot grid ticks: Oregon coordinate system, north zone (Lambert conformal conic).

Horizontal datum: 1983 North American Datum.
Vertical datum: National Geodetic Vertical Datum of 1929.

PROJECT LOCATION

N

SCALE 1:12,000

.5 0 1 2 KILOMETERS

1000 0 7000 FEET

.5 0 1 MILES

Contour interval: 50 feet, with supplemental contours at 10, 25, and 75 feet

Map by George R. Priest, Oregon Department of Geology and Mineral Industries;
Ming Qi and António M. Baptista, Oregon Graduate Institute of Science & Technology;
Curt D. Peterson and Mark E. Darienzo, Portland State University

Cartography by Mark E. Neuhaus