

Sheet 3. Seismically induced liquefaction susceptibility from a Cascadia subduction zone magnitude 9+ earthquake for the Ocean Shores and Westport Peninsulas, Grays Harbor County, Washington

by

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Susceptibility to earthquake-induced soil liquefaction from ground shaking associated with a M9+ Cascadia subduction zone earthquake affects much of the lowlands and mapped tsunami inundation zones of the Ocean Shores (Map A) and Westport (Map B) peninsulas. The groundwater condition modeled is at the surface (0 ft) and is assumed homogeneous throughout the area. Beach and dune sands are the dominant soil underlying the report area, and all of it is susceptible to liquefaction. However, analysis of the limited borehole data categorized the initiation of liquefaction hazard as low to moderate. The relatively low initiation of liquefaction values are likely due to compaction of sand from wave action of the Pacific Ocean. Wave action compacted the sand on beaches such that the seismic energy necessary to initiate liquefaction may not be strong enough to initiate widespread liquefaction. Peat is a significant deposit on both peninsulas and covers more than 7 percent of the lowlands. Peat, which is not liquefiable, is considered a risk for deformation and sand boils from underlying liquefiable sediments. Wetlands cover approximately 14 percent of the Ocean Shores peninsula and 18 percent of the Westport peninsula. Nearly all of the mapped peat deposits coincide with the wetlands inventory; however, not all of the wetlands contain peat. Wetland areas should be recognized as areas where saturated soils are present in the subsurface and the increased likelihood of initiation of liquefaction should be considered, as well as potential hazards from unmapped peat deposits. Though the liquefaction susceptibility is generally lower in the study area, deformation from peat is a potential risk, especially where evacuation routes cross peat deposits.

**Liquefaction hazard rating**

- Peat
- Very low
- Very low to low
- Low to moderate
- Moderate to high  
*(not present on these map extents)*
- High
- All others not evaluated

**Map symbols**

-  Wetlands
-  Evacuation routes
-  Upland/lowland division
-  20-foot contour
-  Post-tsunami assembly areas
-  Airport
-  Lighthouse
-  Camp ground

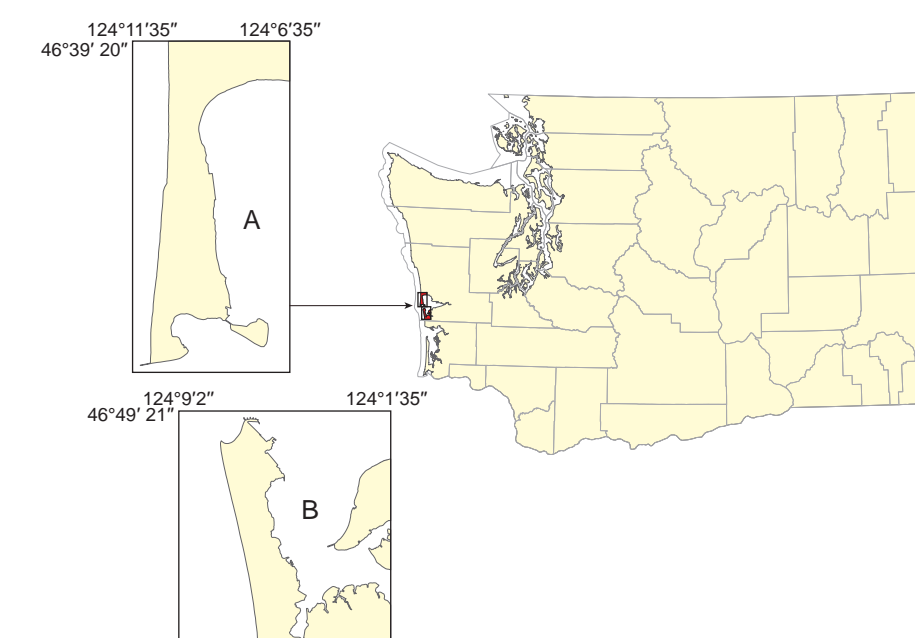
**Borehole liquefaction initiation,  
groundwater assumed  
at ground surface (0 ft)**

- Very low
- Low
- High

▲ Boreholes not used for  
quantitative analysis  
(Map A only)

Lambert conformal conic projection  
North American Datum of 1983  
Shaded relief generated from U.S. Geological Survey 10-meter digital elevation model;  
sun azimuth 315°; sun angle 45°  
Digital cartography and GIS by Stephen L. Slaughter, Ian J. Hubert, and Anne C. Olson  
Editing and production by Jareta M. Roloff

Tsunami evacuation routes and post-tsunami evacuation areas are not intended for emergency use and are included for reference purposes only. The objective of these map products is to assist city and emergency management officials in evaluating the suitability of existing evacuation routes and assembly areas for potential vulnerability to ground failure from a M9 CSZ earthquake. Results of this report could necessitate modifying, adding, or removing current tsunami evacuation routes and/or post-tsunami assembly areas.



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