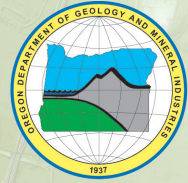


OREGON DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

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Oregon coast now fully mapped for tsunami dangers

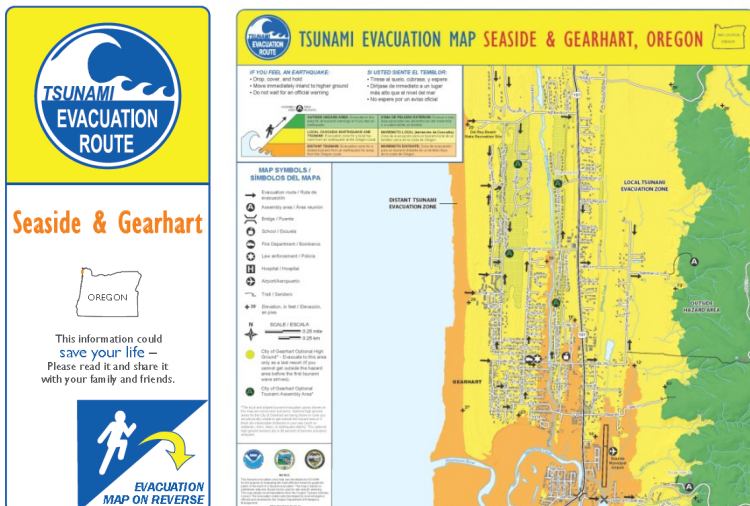
Coast is safer for summer beach season after four-year mapping and outreach effort reaches milestone

Portland, Oregon: Beachgoers this summer should pack not only their sunscreen and favorite novel, but also a tsunami evacuation map. For the first time, Oregon's entire coast has maps showing where to evacuate in the event of a tsunami. This information could save your life and those you love.

A catastrophic Cascadia earthquake and tsunami is a matter of *when*, not *if*. But our state is now more tsunami-ready than before. The Oregon Department of Geology and Mineral Industries (DOGAMI) has completed its work under a federal grant to create a new generation of tsunami maps and to educate vulnerable coastal communities how to prepare.

"We're the first generation in Oregon to fully understand the threat from earthquakes and tsunamis," said Governor John Kitzhaber. "This project has brought coastal communities together to become more prepared, thanks to federal funding, state expertise in mapping and outreach, and a local sense of responsibility. Coastal residents want to live with peace of mind and also let visitors know they're open for business and will know where to go if a tsunami strikes," Kitzhaber said.

Knowing where to go means understanding where high ground is, including the nearest tsunami assembly area. DOGAMI developed a total of 131 new maps, including 89 new tsunami inundation maps (TIMs) and 42 new evacuation maps; the latter are available free as pocket-sized brochures. The attached fact sheet explains where to get new maps and how they were developed.



Example of a tsunami evacuation map (brochure). Evacuate from orange and yellow areas to green area. Forty-two brochures have been published, covering Oregon's coastal population centers. Those living outside the map areas can get this information via OregonTsunami.org by clicking on "Evacuation Zone Map Viewer."

DOGAMI's mission is to provide earth science information and regulation to make Oregon safe and prosperous.

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“These new maps and the State’s outreach have definitely made our county safer,” said Gordon McCraw, Tillamook County emergency manager. “Several areas conducted their very first tsunami evacuation drill, and some have had more drills since then. Residents and visitors practiced their evacuation routes to high ground, and folks really worked well together,” McCraw said.

The program has also helped an additional 14 communities to become TsunamiReady, a designation by the National Weather Service recognizing cities and counties who strengthen their local tsunami plans and communications. Communities will have fewer fatalities and less property damage if they plan before a tsunami happens. (An additional seven entities, from fire districts to school districts, earned TsunamiReady Supporter status.)

“After Japan’s devastating tsunami two years ago, we’ve been working hard to finish our maps and conduct outreach to coastal areas,” said Vicki McConnell, State Geologist. “I want to thank NOAA for funding this work and our local partners – from fire chiefs to ham radio enthusiasts – for their leadership in getting our coast ready. We can’t prevent a tsunami but we can prepare for one.”

Maps and more information at www.OregonTsunami.org

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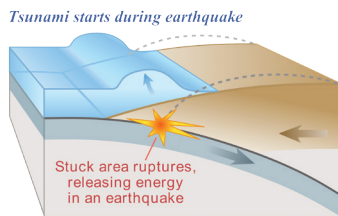
The Oregon Department of Geology and Mineral Industries is an independent agency of the State and has a broad responsibility in developing an understanding of the state’s geologic resources and natural hazards. The Department then makes this information available to communities and individuals to help inform and reduce the risks from natural hazards, such as earthquakes, tsunamis, landslides, floods and volcanic eruptions. The Department assists in the formulation of state policy where an understanding of geologic materials, geologic resources, processes, and hazards is key to decision-making. The Department is also the lead state regulatory agency for mining, oil, gas and geothermal exploration, production and reclamation.

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In summer 2013 DOGAMI completed mapping for modeled tsunami inundation along the entire Oregon coast. This 4-year, NOAA-funded project brought together the latest science, new mapping techniques, and lessons learned from earthquakes and tsunamis around the globe.

Why should we get ready for tsunamis in Oregon?

Oregon sits on the Pacific Rim “ring of fire,” a zone of very active plate tectonics. If plates move suddenly (“slip”) in an area where they usually stick, an earthquake happens. When a plate descends, or “subducts,” under an adjacent plate, a subduction zone exists.



Tsunami diagram: <http://pubs.usgs.gov/circ/c1187/>

When earthquakes occur in a subduction zone, they can generate large tsunamis. Tsunamis can come from local or distant sources.

A **local tsunami**, caused by a big Cascadia Subduction Zone (CSZ) earthquake just off our coast, can come on shore within 15–20 minutes, before there’s time for an official warning. Ground shaking from the earthquake may be the only clue that you should evacuate quickly on foot to a safe area.

Recent work by the U.S. Geological Survey ([Professional Paper 1661-F](#)) suggests that the probability of a giant full-rupture earthquake (magnitude 8.8–9.2) of the CSZ is 7–12% in 50 years. For a smaller, southern margin CSZ event (in southern Oregon and northern California), the probability is 37–42%.

A **distant tsunami**, caused by an undersea earthquake along the Pacific Rim far away from Oregon’s coast, will take four hours or more to come ashore. You won’t feel an earthquake, and there will be time for an official warning and evacuation to a safe area.

For either kind of tsunami, it’s important to know where your safe area is and how to get to it before the first waves arrive.

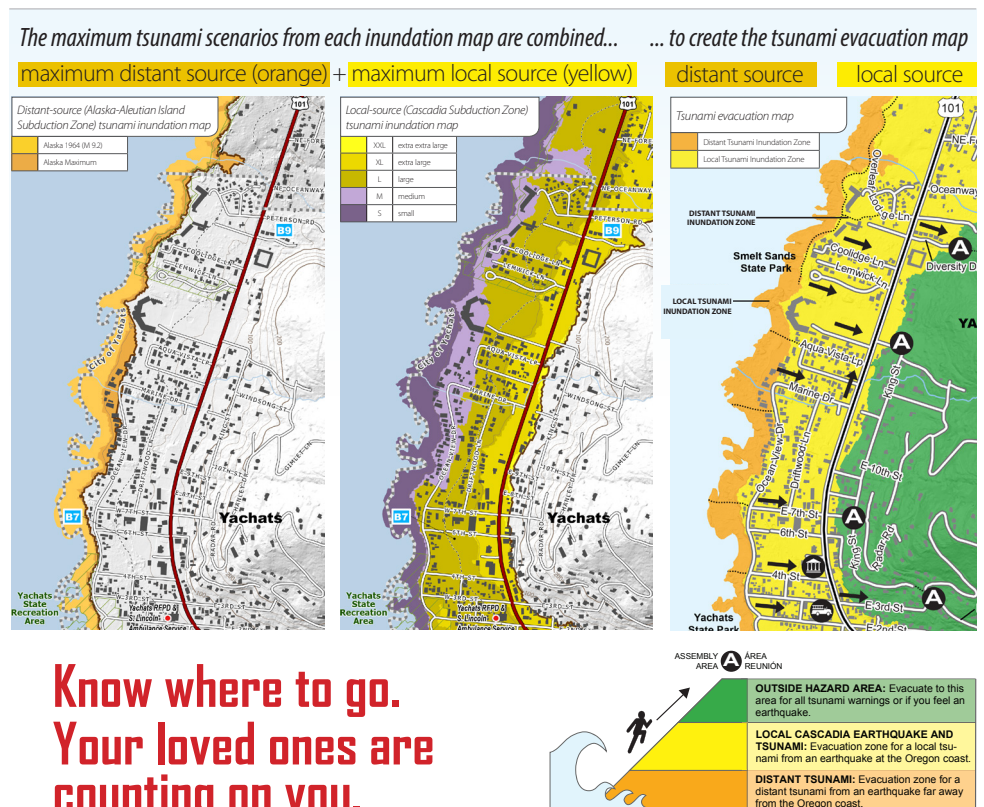
How do tsunami inundation and evacuation maps work?

These maps show safe areas so you can locate your home, school, or business, find your safe area, and practice your route to the safe area.

To create the **inundation maps**, DOGAMI scientists modeled tsunami scenarios for local-source (Cascadia Subduction Zone, or CSZ) and for distant-source (Gulf of Alaska subduction zone) tsunamis. CSZ scenarios can show a wide range of inundation in the same area. To make it easier to understand CSZ inundation scenarios for different earthquake sizes, the sizes are labeled like T-shirts: small (magnitude ~8.7), medium (magnitude ~8.9), large (magnitude ~9.0), extra-large (magnitude ~9.1), and extra-extra-large (magnitude ~9.1). XL and XXL scenarios simulate tsunamis similar to the 2011 Tōhoku, Japan, tsunami.

For distant-source earthquakes, DOGAMI scientists modeled two inundation scenarios: one simulates the 1964 Alaska magnitude 9.2 earthquake and tsunami; the other simulates a hypothetical maximum considered Alaska tsunami from a magnitude ~9.2 event with more seafloor uplift and positioned to focus tsunamis at the Oregon coast.

To make the **evacuation maps**, the Cascadia XXL scenario and the hypothetical maximum Alaska scenario inundation zones are put on one map. Green on the evacuation map shows typically higher elevation areas that lie outside the tsunami hazard zones. The evacuation map also shows safe evacuation routes and assembly areas, as developed by local emergency authorities.



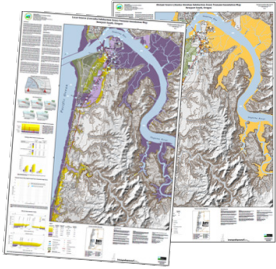
**Know where to go.
Your loved ones are
counting on you.**



WHERE CAN I GET THE MAPS?

You can get the maps in several ways:

Tsunami inundation maps (TIM series)



DOGAMI publishes detailed tsunami inundation maps (known as TIMs), showing multiple scenarios for local and distant tsunamis. These technical maps are intended for planners, scientists, emergency managers, elected officials, and others to help mitigate risk and reduce the loss of life and property to tsunamis. TIMs cover the entire Oregon coast and are

available for purchase via OregonTsunami.org.

Tsunami evacuation maps (based on TIM maps)



Evacuation maps, covering the most populated areas of the Oregon coast, show maximum considered scenarios for local and distant tsunamis. The maps are included in brochures that also contain preparedness tips and information on what to do in a tsunami. Brochures are available from coastal area emergency management authorities or free from OregonTsunami.org.

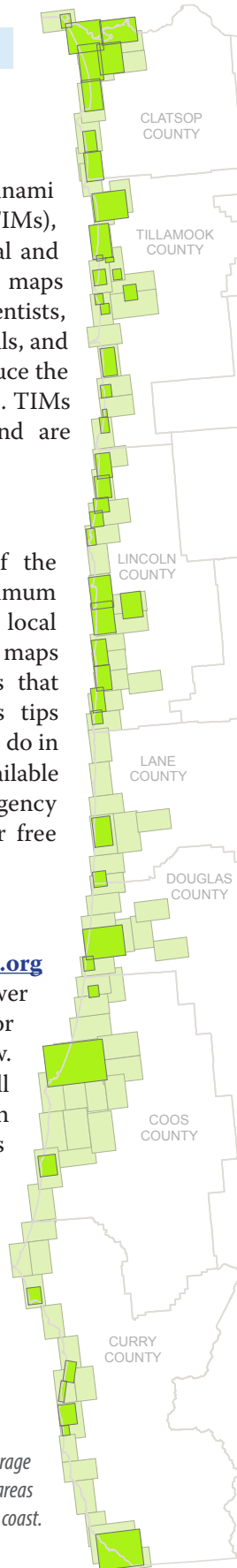
Interactive web map and smartphone apps



The website OregonTsunami.org features an interactive map viewer where you can type in a city or address and customize your view. The interactive map contains all the data as shown in the evacuation maps. While evacuation maps cover only the most populated areas, the interactive maps show the entire Oregon coast.

Smartphone users can download **TsunamiEvac-NW**, a free mobile app for [iPhone](#) and [Android](#) with the same mapping format.

Tsunami mapping along the Oregon coast. Light green areas represent the full coverage of the Oregon coast in the DOGAMI tsunami inundation map series. Dark green areas show tsunami evacuation brochure coverage for populated areas along the coast.



MORE RESOURCES

Earthquake & tsunami preparedness



OregonTsunami.org

<http://www.OregonTsunami.org>

Nature of the Northwest Information Center (for TIM series maps)

(<http://www.naturenw.org>) is operated by the Oregon Department of Geology and Mineral Industries and carries earthquake and tsunami hazard maps. 800 NE Oregon St., #28, Ste. 965, Portland, OR 97232, phone 971-673-2331.

Living on Shaky Ground: How to Survive Earthquakes and Tsunamis in Oregon

http://www.oregongeology.org/tsuclearinghouse/resources/pdfs/shakygroundmagazine_Oregon.pdf

Are You Ready? An In-Depth Guide to Citizen Preparedness

<http://www.fema.gov/areyouready/>

Earthquake & tsunami organizations

Oregon Emergency Management

(<http://www.oregon.gov/OMD/OEM/>)

American Red Cross

<http://www.redcross.org/>

Federal Emergency Management Agency (FEMA)

<http://www.fema.gov/>

NOAA West Coast and Alaska Tsunami Warning Center

<http://wcatwc.arh.noaa.gov/>

National Tsunami Hazard Mitigation Program (NTHMP)

<http://nthmp.tsunami.gov/>

Oregon Seismic Safety Policy Advisory Commission (OSSPAC)

<http://www.oregon.gov/OMD/OEM/osspace/osspace.html>

Oregon Partnership for Disaster Resilience

<http://opdr.uoregon.edu/>

Cascadia Region Earthquake Workgroup (CREW)

<http://www.crew.org/>

Tsunami evacuation brochures are available at the coast from some fire stations, city halls, and libraries, or free from OregonTsunami.org.

