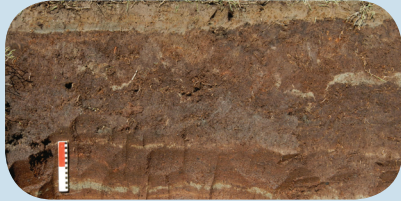


Information about past tsunamis helps us model what might happen in the future

Tsunami deposits



Discovery Bay, WA, has layers of sediment from past tsunamis. These contain thin layers of tiny, sand grains and mud from the ocean that spread far inland.

Ghost forests



Copalis Ghost Forest, WA, is a graveyard of trees killed by salt water during earthquake-caused land level changes. Tree ring ages reveal when this occurred.

Turbidite deposits

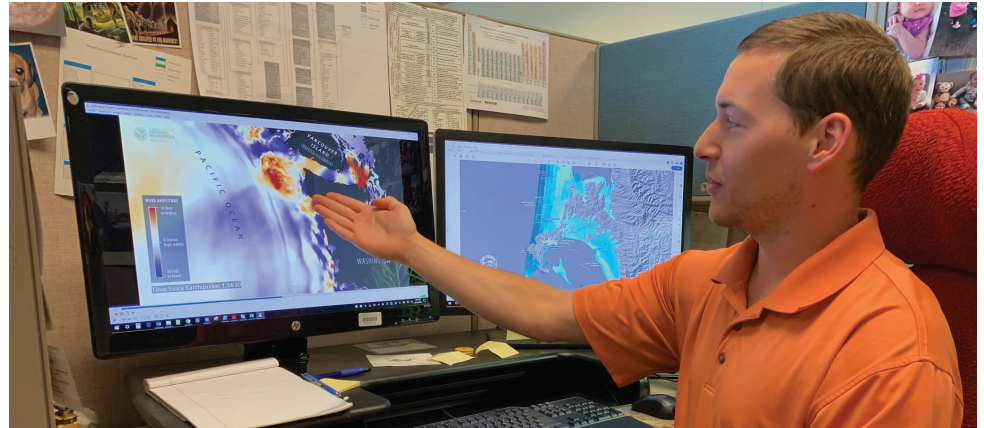


Near Rialto Beach, WA, sediment sequences were deposited by deep-sea landslides triggered by strong earthquake shaking.

For more information about tsunamis, earthquakes, and historical events in Washington, check out:

www.dnr.wa.gov/tsunami

How we make our tsunami hazard maps and videos

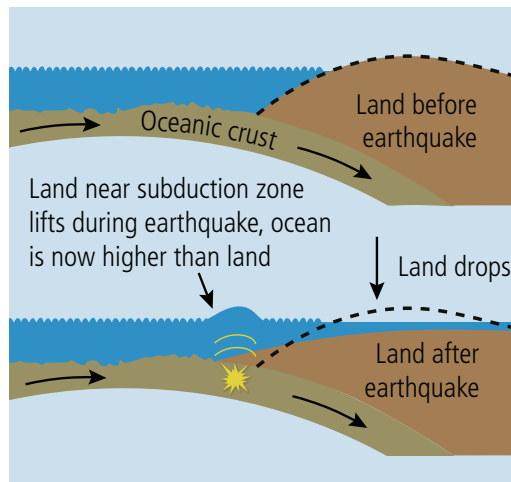


How are tsunami models made?

The first step to tsunami modeling is the source. Earthquakes and landslides are the primary tsunami sources, but earthquake-generated tsunamis are more likely to impact large areas. For this reason, most tsunami models simulate an earthquake and demonstrate how waves spread from the rupture. There are a few places in the Earth where earthquakes could create (and have created) tsunamis that impact Washington's shores:

- Cascadia subduction zone
- Distant subduction zones, like the Aleutian/Alaska subduction zone
- Crustal faults within Puget Sound, like the Seattle Fault

The tsunami model is based on the initial earthquake location/size and the path the tsunami waves take. The wave path depends on the shape of the seafloor and the land, both of which are usually altered during the earthquake (see box below). A mathematical simulation using high-speed computers then models the size and impact of the tsunami.



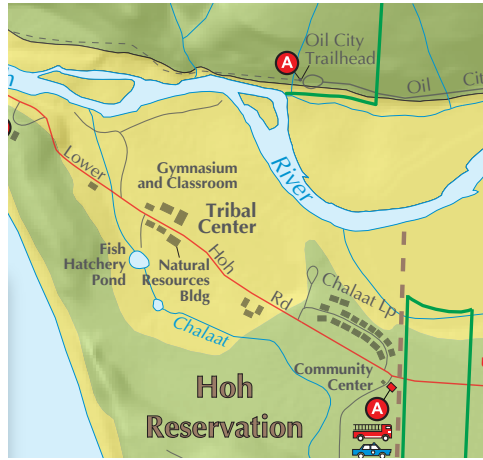
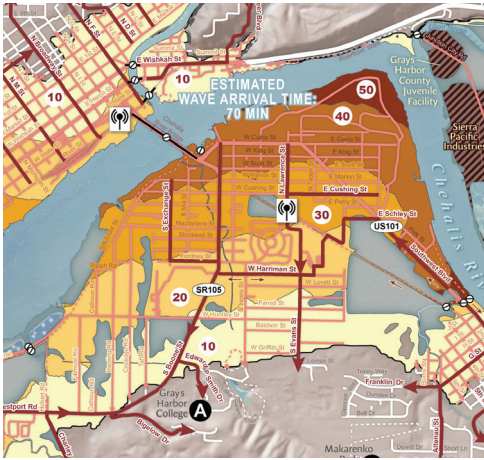
Land Level Change vs. Tsunamis

Earthquakes alone can make the land uplift or drop down, potentially causing the ocean to flood the land or recede. This can happen whether or not a tsunami occurs.

When a tsunami is also generated, the flooding will be more severe and the waters will move quickly and violently.

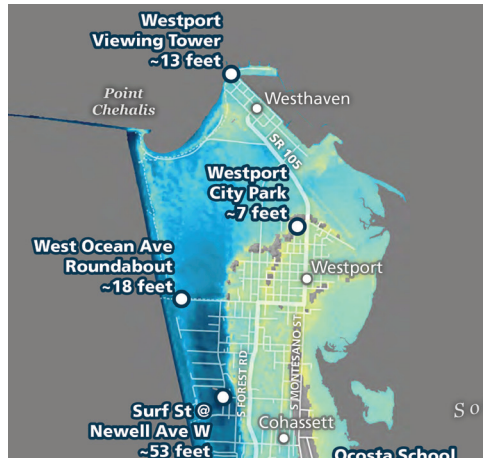
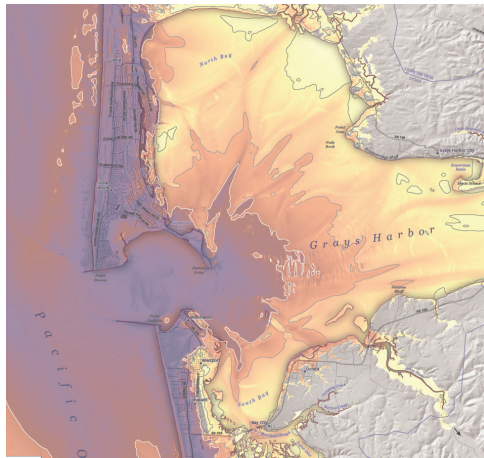
WASHINGTON GEOLOGICAL SURVEY TSUNAMI PRODUCTS

We offer a variety of maps and videos to show the modeled effects of a tsunami on Washington's shores. These include evacuation brochures and walk time maps, current speed and inundation maps, and simulation videos. Read below to find out more about each of these products and how you can access them.



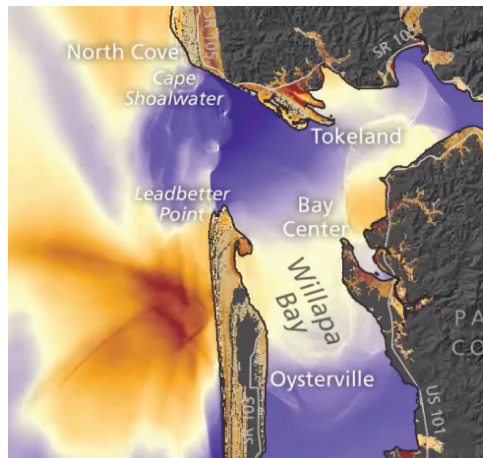
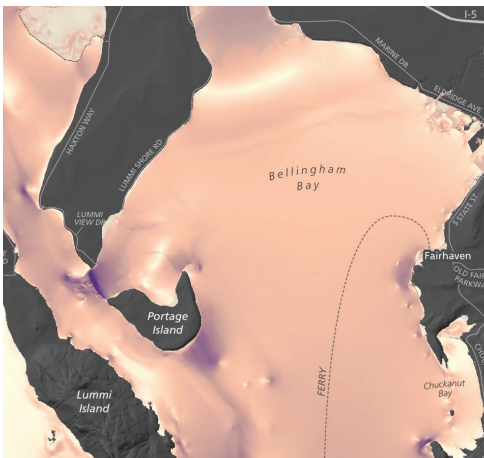
Evacuation Maps

Walk time maps (left) show the amount of time it would take to walk out of a tsunami hazard zone, assuming a pace of 24 minutes/mile. Evacuation brochures (right) distinguish tsunami hazard zones from safe areas. Walk time maps are being released as new modeling becomes available. Evacuation maps can be found [on our website](#).



Speed and Inundation Maps

Current speed maps (left) show the maximum speed of the tsunami waves. Inundation maps (right) show the maximum depth of onland flooding that can be expected from a tsunami. Speed and inundation maps can be found [on our website](#).



Simulation Videos

Current speed videos (left) show how the speed of the tsunami waves change during the tsunami, which can last many hours. Amplitude and inundation videos (right) show how the heights of the tsunami waves change throughout the tsunami, in the water and on land. Simulation videos can be found [on our website](#).



WASHINGTON STATE DEPT OF
NATURAL RESOURCES
WASHINGTON
GEOLOGICAL SURVEY

Check our Geologic Information Portal at geologyportal.dnr.wa.gov to find and download all of our published hazard maps!

Questions? E-mail us: geology@dnr.wa.gov Call us: 360-902-1450