



COASTAL STATES ORGANIZATION

TSUNAMIS

A National Threat

Tsunamis can be triggered by undersea landslides, earthquakes or volcanic eruption, and changes in air pressure caused by fast-moving, severe thunderstorms, and can take place in diverse geographies. In fact, even the Great Lakes can experience atmospheric-pressure-driven tsunamis, called meteotsunamis. Tsunamis can travel at speeds up to 500 mph; and though they typically slow to 20 to 30 mph as they approach coastlines, the wavelength of tsunamis decrease and the height increases, causing catastrophic damages to people and properties on the coast, in low-lying areas of the coast, and near bays and estuaries.

Types of Tsunamis

- **Local** tsunamis happen within 100km of land, and are typically the most devastating because they occur quickly ~ less than an hour.
- **Distant** tsunamis typically take up to 3 hours to hit a region and are less destructive than local tsunamis.
- **Meteotsunamis**, a type of local tsunami, are caused by air pressure, and can reach heights of 6 feet or more when hitting shore.

REGIONAL RISK



What are the States Doing?

HAWAII

The Hawai'i Coastal Program, in partnership with the Hawai'i Emergency Management Agency, is pursuing mitigation of tsunamis hazards through the development of high-resolution **Probabilistic Tsunami Design Zone** maps, which are compatible with the American Society of Civil Engineers for the Island of O'ahu. The Mapping software will provide O'ahu tools and data for more accurate mapping and modeling, and will help communities create tsunami scenarios. The software is scheduled for release in 2019.

OREGON

Located 70-100 miles off the Oregon coast, the Cascadia Subduction Zone can produce earthquakes of 9.0 or higher on the Richter scale, which would generate a tsunami that will hit the Oregon coast within 15-25 minutes. The Oregon Coastal Program produced the **Tsunami Land Use Guide**, which helps communities to become more resilient to a catastrophic tsunami event through community land use options and strategies, such as preventing the development of new critical facilities (e.g. schools, hospitals, fire stations) within the tsunami zone. The Land Use Guide provides communities with model policy and development code language to help address their tsunami risk.

WASHINGTON

The Washington Coastal Program is working with state and federal partners to coordinate program improvements and leverage resources to better support community needs. In particular, the **Washington Coastal Hazards Resilience Network** is being used as a tool for regional coordination and collaboration. Results of this collaboration include the three-year Coastal Resilience Project, improving risk projections and providing guidance for land use planners – tools that coastal communities need to become resilient.

Tsunami Event estimates from 1668-2018.

Source: <https://nws.weather.gov/nthmp/ushazard.html>

More Coastal Program Tools & Resources

- Oregon Community Resilience Training** offers presentations from Oregon Risk MAP partners to benefit local hazard mitigation staff. The presentations introduce viewers to state and federal agencies involved in hazard resilience and provide tools for accessing program support.
- Oregon TsunamiReady, Tsunami Prepared Hazard Mitigation Program** is a partnership led by the Oregon Department of Geology and Mineral Industries with the goal of working with communities on the Oregon coast. The program seeks to help communities prepare for and respond to an earthquake and tsunami generated by a rupture of the Cascadia Subduction Zone,
- Oregon includes **evacuation maps**, designed to direct visitors and residents away from low-lying areas in a tsunami event.
- The Washington Department of Ecology partners with FEMA to run the **Risk Mapping, Assessment and Planning (Risk Map)** program in Washington. This program provides data and risk assessment tools to help communities mitigate impacts of floods, earthquakes and other natural hazards.
- In partnership with Hawai'i Sea Grant and Department of Land and Natural Resources, the Hawai'i Coastal Program is working to build capacity for state and county agencies to effectively integrate hazards resilience considerations into their community planning efforts. The **Integrating Coastal Hazards and Sea Level Rise Resilience in Community Planning** project is still being developed.



State Coastal Programs are working with communities to protect our coasts from these hazards.

Tsunamis have caused more than 700 deaths and just under \$2 billion in damage to U.S. coastal states and territories.

Source: <https://www.ngdc.noaa.gov/hazard/data/publications/tsunami-hazard-assessment-2015.pdf>, National Weather Service, 2019

NATIONAL TOOLS & RESOURCES



Tsunamis: Be Prepared and Stay Safe! is a video available through the Digital Coast for communities to better understand how to prepare and respond to a tsunami.

Tsunami Aware provides evacuation maps and related tsunami information to keep the public in Hawaii and Guam informed and aware of the dangers of tsunamis.



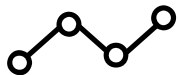
The **U.S. Tsunami Warning Centers** issue tsunami messages to notify emergency managers, the public, and other partners about the potential for a tsunami following a possible tsunami-generating event.

The **Tsunami Data and Information** tool is a downloadable resource that provides data, maps, photos, posters and publications for engineers, oceanographers, managers and the public.



The **Coastal Flood Exposure Mapper** is an online tool to support communities that are assessing their coastal hazard risks and vulnerabilities. Communities have the ability to observe user-defined maps that show people, places, and natural resources exposed to coastal flooding, sea level rise and tsunamis.

The **Hazards U.S. Multi-Hazard (HAZUS-MH)** is a national tool that estimates potential losses from earthquakes, hurricane winds, and floods and can help communities prepare for the chance of a tsunami.



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