Tsunami Basics

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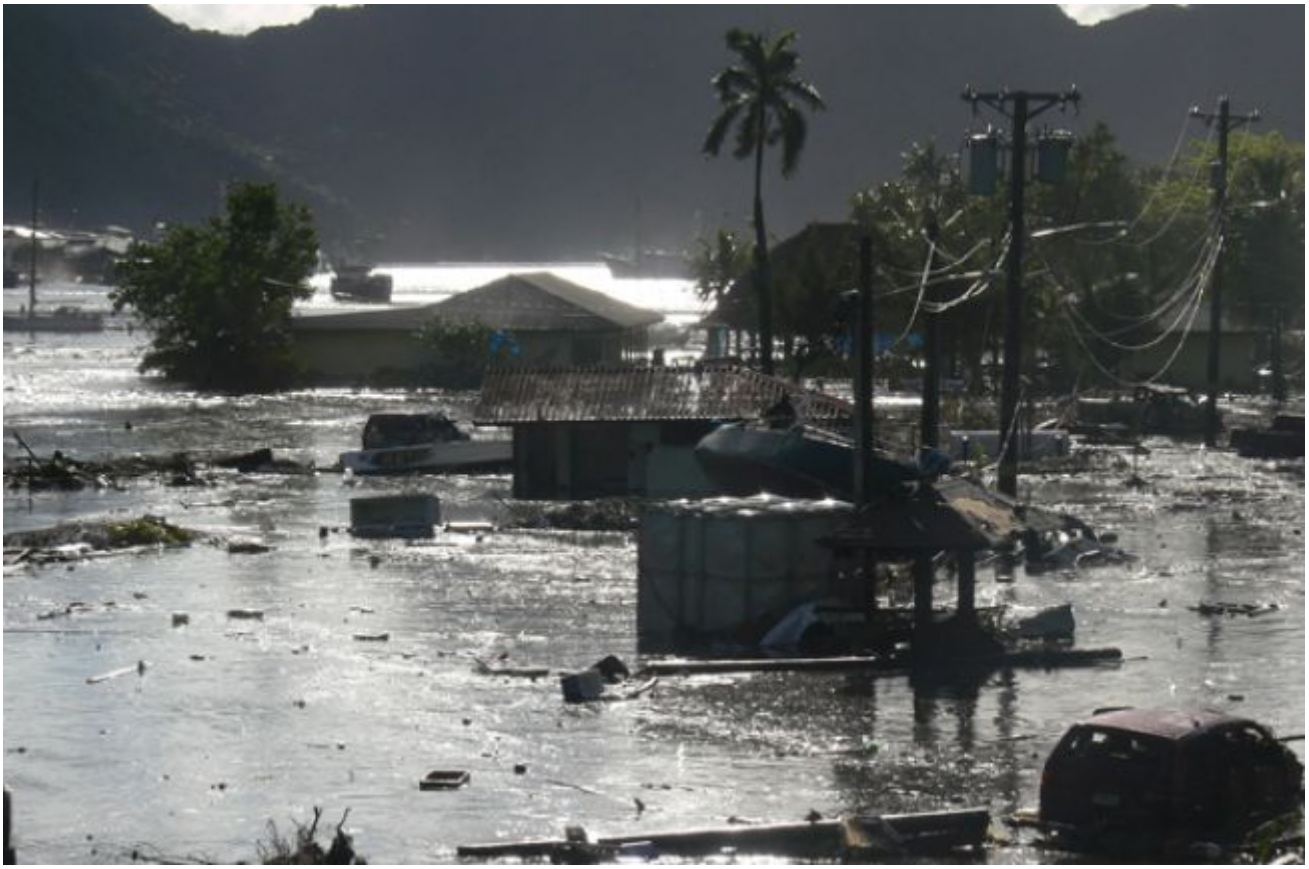


A tsunami is a series of waves formed in a body of water by the sudden displacement of the entire water column. Most large tsunamis are caused by undersea earthquakes, though landslides, volcanic eruptions, explosions, and even meteorite impacts can also cause them. Tsunamis commonly appear on shore as a rapidly receding tide or rapidly rising flood. Tsunamis sometimes provide natural warning signs to people living on coasts, especially close to the tsunami-causing event, such as a rapidly receding tide prior to the waves' arrival. Global monitoring systems also provide critical early warning to coastal populations.[1]

Why do tsunamis matter?

Tsunamis can be highly destructive, causing extensive loss of life and property damage. They have killed more than 350 people on the coast of the United States since 1946, with losses exceeding half a billion dollars.[2] Even larger tsunamis, like the ones that devastated Chile in 1960, Japan in 2011, and Indonesia in 2004, have hit the U.S. Pacific coastal states in the past and could hit them again.

How can geoscience help inform decisions about tsunami hazards?

Tsunamis can’t be prevented, but scientists use earthquake information, tide gauges, and tsunami detection buoys to issue early warnings and give people time to evacuate. Others study records of prehistoric tsunamis left in the geologic record along coasts. These studies help determine the probability of tsunamis on different coastlines, leading to better hazard planning and preparedness. Some geoscientists study the shape and topography of coastal regions to determine the areas likely to be flooded

during a tsunami of a given size, which helps to further refine hazard mitigation and evacuation plans.

References

[1]Pacific Tsunami Warning Center, http://ptwc.weather.gov

[2]NOAA/WDC Tsunami Event Database, www.ngdc.noaa.gov/nndc/struts/form?t=101650&s=70&d=7

Learn More

Introductory Resources

- About Tsunamis (Webpage), *International Tsunami Education Center*
  In-depth discussion of tsunamis, their causes, and tsunami preparedness for a non-expert audience.

- Preparedness and the Tsunami Resilient Community (Webpage), *National Oceanic and Atmospheric Administration*
  Links to national, state, and international tsunami preparedness and response programs.

Resources for Educators

- Education Resources Network, *AGI's Center for Geoscience & Society*
  Search for tsunami resources in: Organizations, Curricula & Instruction, Teaching Media, Outreach Programs

- NGSS Performance Expectations, *Next Generation Science Standards*
  K-ESS3-2, 2-ESS2-3, 3-ESS3-1, 4-ESS3-2, 5-ESS2-2, MS-ESS3-2, HS-ESS2-5, HS-ESS3-1

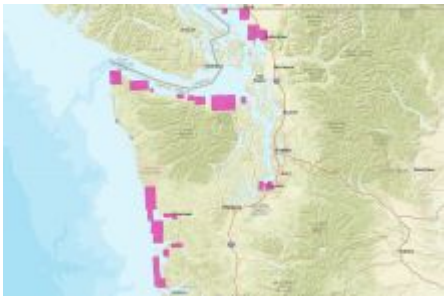
- NGSS Disciplinary Core Ideas, *Next Generation Science Standards*
  ESS2.C, ESS3.B

Frequently Asked Questions

How are tsunami early warnings issued?
American Geosciences Institute
What are the natural warning signs for a tsunami?
National Oceanic and Atmospheric Administration

Do you have a question that's not listed here? Search all FAQs

Maps & Visualizations



Interactive map of tsunami evacuation information for Washington
Washington Division of Geology and Earth Resources

The Tsunami Evacuation Map from the Washington Division of Geology and Earth Resources provides a large amount of information about tsunami evacuation procedures for the state of Washington. Each of the shaded areas in the image above can be zoomed in on for more detailed information including...

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2017-05-18