Distant Source (Alaska-Aleutian Subduction Zone) Tsunami Inundation Map
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Introduction

The Aleutian Islands of Alaska, and south along the coast of North and South America, present a distinct and distinctively different peril. Both onshore and offshore, devastating tsunamis have created devastating impact. The tsunami event on October 25, 1964, was a prime example of the destructive power of tsunami events. This event was characterized by a M9.2 earthquake that caused a vertical displacement of water, creating a tsunami. The tsunami inundation map shown here highlights the area of expected tsunami inundation based on scientific evidence and computer simulation models. It is designed to help cities, counties, and other sites that require hazard maps to generate tsunami inundation maps to help residents and visitors understand and mitigate this geologic hazard. DOGAMI’s work is designed to help cities, counties, and other sites that require hazard maps.

Rupture

A rupturing fault plane on the ocean floor is known as a subduction zone. Subduction — when thin, oceanic lithosphere is forced down into the mantle — can trigger tsunamis. An earthquake can be the result of this subduction, causing the energy to be released in the form of seismic waves. These waves can travel across the ocean, creating a tsunami.

Earthquake

An earthquake is a vibration of the Earth’s crust. They are caused by movement along a fault line, which is a break in the Earth’s crust. When this movement occurs suddenly, it can release a lot of energy in the form of seismic waves. Some earthquakes cause little damage, while others can be devastating, like the 1964 event near Anchorage, Alaska. The earthquake can be felt at the surface, and it can trigger a tsunami.

Tsunami

A tsunami is a series of waves that travel across the ocean. They are caused by an earthquake or volcanic eruption that occurs underwater. When the water is displaced, it creates a series of waves that can travel across the ocean at speeds of up to 700 miles per hour. Some tsunamis can reach heights of 50 meters or more, making them a dangerous and destructive force.

Map Exploration

This map depicts the tsunami waves as they arrive at the selected reference point (simulated gauge station). It shows the change in wave heights for a range of times starting 200 seconds after the initial tsunami arrival. The map is split into two parts: the left part shows the tsunami wave heights for each time step, while the right part shows the time series graph and wave elevation profiles.

Legend

The legend shows the color-coded representation of tsunami wave heights. The legend indicates that the wave heights are represented by different colors, with each color corresponding to a specific range of wave heights. The color bar also includes the respective wave height values for each color.

Data References

The data used for this map includes tsunami hazard maps of the Oregon coast, Oregon Department of Geology and Mineral Industries (DOGAMI), National Geophysical Data Center/World Data Center (NGDC/WDC), Global Historical Tsunami Database, Boulder, CO, USA.

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