



NOAA's Pacific Tsunami Warning Center

In 1946 a tsunami originating in the Aleutian Islands struck Hawaii without warning. More than 150 people died from this event. The tragedy prompted the U.S. Coast and Geodetic Survey to develop a tsunami warning system for Hawaii that would minimize losses in the future. After two years of planning and development, the Pacific Tsunami Warning Center (PTWC) was formed in 1949. Today, the PTWC is operated by the National Weather Service under the National Oceanic and Atmospheric Administration

(NOAA). Located in Ewa Beach, Hawaii, the Pacific Tsunami Warning Center now provides warnings for tsunamis to most countries in the Pacific Basin as well as to Hawaii and all other U.S. interests in the Pacific outside of Alaska and the U.S. West Coast.

The Warning Center receives a constant flow of information from seismometers (instruments that detect earthquakes) and tide-gauge stations all around the Pacific Ocean. When an earthquake with the potential to generate a tsunami occurs, the Warning Center puts out a three-tiered message. A "Warning" is issued for areas that will be impacted within three hours from the source. A "Watch" is issued for areas that will be impacted in six hours. An "Information Message" is issued for areas that are beyond six hours tsunami travel time. The messages are updated hourly as new incoming tide gauge data is evaluated. If it is determined that the tsunami will not be destructive outside of the source region, the warning/watch process is cancelled. However, if the tsunami is determined to be destructive outside the source region, a Pacific-wide tsunami warning is issued. The last destructive tsunami occurred in 1964 following the Great Alaska Earthquake.

As the Operational Center for the Tsunami Warning System in the Pacific, PTWC provides warnings for Pacific basin teletsunamis (tsunamis that can cause damage far away from their source) to almost every country around the Pacific rim and to most of the Pacific island states. This function is carried out under the guidance of the UNESCO/IOC International Coordination Group for the Tsunami Warning System in the Pacific (ITSU). A few destructive teletsunamis are generated each century by great earthquakes around the Pacific rim. Such tsunamis can propagate across the entire Pacific in less than 24 hours, and cause widespread destruction along shorelines located thousands of miles from the source. With ever-increasing population and development along most coastlines, there is a corresponding increase in risk.

The Warning Center provides warnings for teletsunamis to Hawaii, Guam, American Samoa, Wake Island, Johnston Island, the Commonwealth of the Northern Marianas, the Federated States of Micronesia, the Republic of the Marshall Islands, and all other U.S. interests in the Pacific, and Indian Ocean and Caribbean Sea countries.

For local tsunamis generated in Hawaiian waters, the Pacific Tsunami Warning Center provides a more rapid warning – typically within 5-10 minutes of the origin time of the earthquake. Two significant local tsunamis have been generated in Hawaii in historical times, one in 1868 and one in 1975. Both were caused by major earthquakes that displaced the sea bottom along the southeast flank of the island of Hawaii. Although these tsunamis caused damage and casualties only on that island, a future local tsunami could have adverse effects further up the island chain. Local tsunamis strike nearby shores almost immediately after being generated by the earthquake. Consequently, the earliest warning for a local tsunami is the strong shaking of the ground, and persons near the shoreline that feel strong shaking should evacuate immediately without waiting for an official warning.