

Tsunami Products

Tsunamis (Japanese for 'harbor wave') are infrequent, yet serious hazards in the Pacific Northwest coastal and offshore waters. A tsunami, erroneously called a tidal wave, is a series of traveling ocean waves of great length and long period (time between wave crests). Tsunamis are generated by disturbances associated with earthquakes or landslides in oceanic and coastal regions. As the tsunami crosses the deep ocean, its length from crest to crest may be one hundred miles or more and its height from trough to crest only a few feet. Although it cannot be felt aboard ships in deep water or seen from the air, tsunami waves in deep water may reach speeds exceeding 600 mph.

As the tsunami enters the shoaling water of the coastlines in its path, the velocity of its waves diminishes and wave heights increase. It is in these shallow waters that a tsunami becomes a threat to life and property. The tsunami inundates normally dry land and can cause unusually strong currents in navigable waters on rare occasions. Tsunamis can crest to heights of more than 100 feet and strike with devastating force.

The Pacific Tsunami Warning System Program (TWS) was developed for monitoring tsunami potential and to ensure timely and efficient distribution of tsunami information. The West Coast/Alaska Tsunami Warning Center (WC/ATWC) in Palmer, Alaska serves the US West Coast and Alaska. The WC/ATWC has the sole responsibility for issuing tsunami warnings, watches, advisories, and information bulletins for the west coast of the United States and British Columbia from Alaska to the border between the United States and Mexico. The Pacific Tsunami Warning Center (PTWC) in Ewa Beach, Hawaii, provides tsunami warnings to most countries in the Pacific Basin, as well as to Hawaii and all other US interests in the Pacific.

Tsunami products are generated by WC/ATWC whenever specific criteria are satisfied. Tsunami watches, warnings, and advisories are disseminated via the National Weather Service, under the NWS identifier ANCTS UWCA (WMO headers WEPA41 and WEPA42). Tsunami information bulletins are issued under the NWS identifier TIBWCA (WEPA43). Examples of various tsunami products are shown at the end of this section.

Tsunami Products

WEPA41 PAAQ 021938
TSUWCA
TO - TSUNAMI WARNING SYSTEM PARTICIPANTS IN
ALASKA/BRITISH COLUMBIA/WASHINGTON/OREGON/CALIFORNIA
FROM - WEST COAST AND ALASKA TSUNAMI WARNING CENTER/NOAA/NWS
SUBJECT - TSUNAMI WARNING BULLETIN - INITIAL
BULLETIN NUMBER 1
ISSUED 06/02/2004 AT 1938 UTC

...A TSUNAMI WARNING IS IN EFFECT FOR THE COASTAL AREAS
FROM POINT SUR-CA. TO LANGARA I.-BC. INCLUSIVE...

...A TSUNAMI WATCH IS IN EFFECT FOR THE COASTAL AREAS FROM
THE CALIFORNIA-MEXICO BORDER TO POINT SUR-CA. AND FROM
LANGARA I.-BC. TO SITKA-AK...

...AT THIS TIME THIS BULLETIN IS FOR INFORMATION ONLY FOR
OTHER AREAS OF ALASKA...

EARTHQUAKE DATA
PRELIMINARY MAGNITUDE - 7.2
LOCATION - 45.3N 124.0W - 95 MILES NW OF EUGENE-OR.
70 MILES SW OF PORTLAND-OR.
TIME - 1130 ADT 06/02/2004
1230 PDT 06/02/2004
1930 UTC 06/02/2004

EVALUATION
IT IS NOT KNOWN - REPEAT NOT KNOWN - IF A TSUNAMI EXISTS BUT A
TSUNAMI MAY HAVE BEEN GENERATED. THEREFORE PERSONS IN LOW
LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR
LOCAL EMERGENCY OFFICIALS. PERSONS ON THE BEACH SHOULD MOVE TO
HIGHER GROUND IF IN A WARNED AREA. TSUNAMI WAVE HEIGHTS CANNOT BE
PREDICTED. TSUNAMIS MAY BE A SERIES OF WAVES WHICH COULD BE
DANGEROUS FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

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PZZ130-131-133-134-132-135-150-153-156-110-250-210-255-350-
353-356-450-455-550-530-535-555-WAZ001-002-005-006-007-008-
009-010-011-013-014-015-016-021-ORZ001-002-021-022-CAZ001-
002-005-007-006-075-074-009-022038-
COASTAL AREAS FROM POINT SUR-CA. TO LANGARA I.-BC.
INCLUSIVE.

...A TSUNAMI WARNING IS IN EFFECT FOR THE COASTAL AREAS
FROM POINT SUR-CA. TO LANGARA I.-BC. INCLUSIVE...

ESTIMATED TIMES OF INITIAL WAVE ARRIVAL
CHARLESTON-OR 1331 PDT JUN 2 ASTORIA-OR 1402 PDT JUN 2
SEASIDE-OR 1332 PDT JUN 2 TOFINO-BC 1410 PDT JUN 2
CRESCENT CITY-CA 1351 PDT JUN 2 SAN FRANCISCO-CA 1502 PDT JUN 2
NEAH BAY-WA 1400 PDT JUN 2 LANGARA-BC 1505 PDT JUN 2

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PKZ032-031-042-034-033-035-041-036-PZZ555-670-673-650-655-
750-AKZ023-024-025-026-028-029-027-CAZ009-034-035-039-040-
046-041-042-043-022038-
COASTAL AREAS FROM THE CALIFORNIA-MEXICO BORDER TO POINT
SUR-CA. AND FROM LANGARA I.-BC. TO SITKA-AK.

...A TSUNAMI WATCH IS IN EFFECT FOR THE COASTAL AREAS FROM
THE CALIFORNIA-MEXICO BORDER TO POINT SUR-CA. AND FROM
LANGARA I.-BC. TO SITKA-AK...

ESTIMATED TIMES OF INITIAL WAVE ARRIVAL
SAN PEDRO-CA 1540 PDT JUN 2 LA JOLLA-CA 1554 PDT JUN 2
SITKA-AK 1452 ADT JUN 2 KETCHIKAN-AK 1518 ADT JUN 2

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THE PACIFIC TSUNAMI WARNING CENTER AT EWA BEACH HAWAII WILL
ISSUE BULLETINS FOR OTHER AREAS OF THE PACIFIC.

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS
WARRANT. THE TSUNAMI WATCH/WARNING WILL REMAIN IN EFFECT
UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE
HTTP://WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION AND ETA SITES.

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Tsunami Warning

(TSUWCA, WEPA41 or WEPA42):

When earthquakes occur within the WC/ATWC's area of responsibility (AOR), Tsunami Warnings are issued under the following circumstances:

- If the initial Richter magnitudes are greater than 7.0, but less than or equal to 7.5, WC/ATWC issues a tsunami warning if the tsunami is within two-hour's wave travel time from the coast
- If the initial Richter magnitudes greater than 7.5, WC/ATWC issues a tsunami warning if the tsunami is within three-hour's wave travel time from the coast.

Warnings are updated hourly until cancellation or until a Final Supplemental Bulletin is issued.

Tsunami Watch

(TSUWCA, WEPA41 or WEPA42):

When earthquakes occur within WC/ATWC's AOR, Tsunami Watches are issued under the following circumstances:

- If the initial Richter magnitudes are greater than 7.0 but less than or equal to 7.5, WC/ATWC issues a tsunami watch if the tsunami is between two-hour's and three-hour's wave travel time from the coast.
- If the initial Richter magnitudes are greater than 7.5, WC/ATWC issues a tsunami watch if the tsunami is between three-hour's and six-hour's wave travel time from the coast.

Tsunami Watches may be included in a Tsunami Warning bulletin. Watches are updated hourly until cancellation or until a Final Supplemental Bulletin is issued.

Tsunami Products

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WEPA41 PAAQ 021941
TSUWCA
TO - TSUNAMI WARNING SYSTEM PARTICIPANTS IN
    ALASKA/BRITISH COLUMBIA/WASHINGTON/OREGON/CALIFORNIA
FROM - WEST COAST AND ALASKA TSUNAMI WARNING CENTER/NOAA/NWS
SUBJECT - TSUNAMI ADVISORY BULLETIN - INITIAL
BULLETIN NUMBER 1
ISSUED 06/02/2004 AT 1941 UTC

...THIS TSUNAMI ADVISORY BULLETIN IS FOR ALASKA - BRITISH
    COLUMBIA - WASHINGTON - OREGON AND CALIFORNIA ONLY...

NO - REPEAT NO - WATCH OR WARNING IS IN EFFECT.

EARTHQUAKE DATA
PRELIMINARY MAGNITUDE - 7.7
LOCATION - 20.3S 175.2W - TONGA ISLANDS
TIME - 1130 ADT 06/02/2004
    1230 PDT 06/02/2004
    1930 UTC 06/02/2004

EVALUATION
BASED ON THE LOCATION/MAGNITUDE AND HISTORICAL RECORDS
THE EARTHQUAKE WAS NOT SUFFICIENT TO GENERATE A TSUNAMI DAMAGING
TO CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA OR ALASKA.
SOME AREAS MAY EXPERIENCE SMALL SEA LEVEL CHANGES.

A FEW SELECTED ETA'S FOLLOW FOR INFORMATION AND REFERENCE
LA JOLLA-CA 2356 PDT JUN 2 TOFINO-BC 0106 PDT JUN 3
SAN FRANCISCO-CA 0015 PDT JUN 3 SITKA-AK 0015 ADT JUN 3
CRESCENT CITY-CA 0009 PDT JUN 3 KODIAK-AK 0002 ADT JUN 3
NEAH BAY-WA 0106 PDT JUN 3 SHEMA-AK 2223 ADT JUN 2

THE PACIFIC TSUNAMI WARNING CENTER AT EWA BEACH HAWAII WILL
ISSUE BULLETINS FOR OTHER AREAS OF THE PACIFIC.

BULLETINS WILL BE ISSUED HOURLY TO KEEP YOU INFORMED OF THE
PROGRESS OF THIS EVENT UNTIL THE PACIFIC TSUNAMI WARNING CENTER
ISSUES A CANCELLATION OR FINAL BULLETIN. REFER TO THE INTERNET
SITE HTTP://WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION AND
ETA SITES.

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Tsunami Advisory (TSUWCA, WEPA41 or WEPA42):

When earthquakes occur with initial Richter magnitudes greater than 7.5, and the epicenter is more than six-hour's travel time away from any part of the WC/ATWC's AOR, the WC/ATWC will issue a Tsunami Advisory Bulletin. The intent of the Advisory Bulletin is to inform participants within the WC/ATWC AOR that a significant earthquake has occurred, but there is not a threat of a tsunami for the west coast of the United States. The Tsunami Advisory states the Pacific Tsunami Warning Center (PTWC) at Honolulu has issued a tsunami warning for parts of the Pacific Ocean, **however, the warning is not for the Pacific coast, from Alaska to southern California.**

A Tsunami Advisory can be updated by the WC/ATWC hourly until:

- A Tsunami Warning or Watch becomes necessary within the WC/ATWC AOR,
- All Tsunami Warnings and Watches issued by PTWC are cancelled, or
- A Final Supplemental Bulletin is issued.

A Tsunami Advisory can be issued when the earthquake's Richter magnitude is greater than 7.5 and the tsunami is within six-hour's travel time to the WC/ATWC AOR, but there is no danger of the tsunami causing damage within the WC/ATWC area of responsibility.

Tsunami Products

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WEPA43 PAAQ 021946
TIBWCA
TO - TSUNAMI WARNING SYSTEM PARTICIPANTS IN
ALASKA/BRITISH COLUMBIA/WASHINGTON/OREGON/CALIFORNIA
FROM - WEST COAST AND ALASKA TSUNAMI WARNING CENTER/NOAA/NWS
SUBJECT - TSUNAMI INFORMATION BULLETIN
BULLETIN NUMBER 1
ISSUED 06/02/2004 AT 1946 UTC

...THIS TSUNAMI INFORMATION BULLETIN IS FOR ALASKA - BRITISH
COLUMBIA - WASHINGTON - OREGON AND CALIFORNIA ONLY...

NO - REPEAT NO - WATCH OR WARNING IS IN EFFECT.

EARTHQUAKE DATA
PRELIMINARY MAGNITUDE - 7.0
LOCATION - 9.1S 150.8E - EASTERN NEW GUINEA REG., P.N.G.
TIME - 1130 ADT 06/02/2004
1230 PDT 06/02/2004
1930 UTC 06/02/2004

EVALUATION
BASED ON LOCATION AND MAGNITUDE THE EARTHQUAKE WAS NOT
SUFFICIENT TO GENERATE A TSUNAMI DAMAGING TO CALIFORNIA -
OREGON - WASHINGTON - BRITISH COLUMBIA OR ALASKA. SOME AREAS MAY
EXPERIENCE SMALL SEA LEVEL CHANGES. IN AREAS OF INTENSE
SHAKING LOCALLY GENERATED TSUNAMIS CAN BE TRIGGERED BY SLUMPING.

THE PACIFIC TSUNAMI WARNING CENTER WILL ISSUE TSUNAMI BULLETINS
FOR HAWAII AND OTHER AREAS OF THE PACIFIC.

THIS WILL BE THE ONLY BULLETIN ISSUED FOR THIS EVENT BY THE
WEST COAST AND ALASKA TSUNAMI WARNING CENTER UNLESS CONDITIONS
WARRANT. REFER TO THE INTERNET SITE HTTP://WCATWC.ARH.NOAA.GOV
FOR MORE INFORMATION.

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Tsunami Information Bulletin: (TIBWCA, WEPA43):

When earthquakes occur within the WC/ATWC AOR, with and the initial Richter magnitudes are from 6.5 to 7.0, WC/ATWC will issue a Tsunami Information Bulletin. The bulletin will state that a sizable earthquake has occurred, but a tsunami was not generated.

The WC/ATWC will also issue a Tsunami information bulletin for earthquakes occurring outside its AOR with initially determined Richter magnitudes of 6.5 to 7.5.

Tsunami ALL CLEAR: A tsunami is a series of waves beginning with the forecast arrival time and lasting four or more hours after the first wave arrives. Hazardous currents can continue in the harbors and channels for several hours after the last wave arrives. Therefore, danger from a tsunami to people and property on the coast can persist for up to two hours after the last tsunami wave. After the tsunami warning is cancelled and little or no tsunami wave action is measured, local community emergency response officials will determine when to call an “all clear”.

Although the WFO Portland does not issue tsunami products, the warnings and watches issued by the WC/ATWC are broadcast over NOAA Weather Radio. The broadcast will describe the magnitude of the earthquake, its location, and estimated wave arrival times along the Oregon coast.

For local tsunami emergency plans, contact your local or county emergency manager.