

PACIFIC TSUNAMI WARNING SYSTEM
PTWS OPERATIONAL USERS GUIDE, SECTION 5.
West Coast/Alaska Tsunami Warning Center (WC/ATWC)
(as of October 2008)

5.1 Introduction

The West Coast/Alaska Tsunami Warning Center (WC/ATWC) is operated by the Alaska Region of the National Weather Service and is located in Palmer Alaska. The Center's area-of-responsibility (AOR) consists of all Canadian coastal regions, Puerto Rico and the U.S. Virgin Islands, and the ocean coasts of all U.S. States except Hawaii. The center collaborates with the Pacific Tsunami Warning Center PTWC to provide tsunami warning service, and mutual backup, to tsunami threatened areas throughout the United States and many other countries throughout the world.

To accomplish its mission of providing accurate and timely tsunami bulletins to its AOR, the center detects, locates, sizes, and analyzes earthquakes throughout the world. Earthquakes that activate the center's alarm system initiate an earthquake and tsunami investigation which includes the following four basic steps: automatic locating and sizing the earthquake; earthquake analysis and review; sea level data analysis to verify the existence of a tsunami and to calibrate models; and disseminating information to the appropriate emergency management officials.

The WC/ATWC staff level has recently been increased such that the center operates 24 hours every day with two watchstanders on duty. The center began 24x7x2 operations on April 23, 2006.

5.2 Warning Criteria

WC/ATWC procedures are organized by the source's geographic region and magnitude. The basic procedures are summarized in the bar chart in Figure 5.1. The actions shown in Figure 5.1 indicate the first message (and in many cases the only message) to be issued. Follow up actions are based on observed wave amplitudes, tsunami models, historical data, and earthquake parameters. Supplemental warning or watch bulletins for events within the AOR are issued every 30 minutes, though may be less often during later times of an event.

5.3 Message Definitions

There are four basic types of messages issued by the WC/ATWC. The definitions have been recently updated within the U.S. Tsunami Warning System and will be in effect in fall, 2007.

Communication Test: Communication tests are conducted monthly. Two tests are conducted: one for primary recipients in the Atlantic basin and one for primary recipients in the Pacific basin. Time that it takes to reach recipient is noted and those who do not receive the test are queried for a response. An example monthly summary sheet is attached.

Information Statement: An Information Statement is issued to inform emergency management officials and the public that an earthquake has occurred. In most cases, Information Statements are issued to indicate there is no threat of a destructive tsunami affecting the issuing Tsunami

Warning Center's Area of Responsibility and to prevent unnecessary evacuations as the earthquake may have been felt in coastal areas. An Information Statement may, in appropriate situations, caution about the possibility of destructive local tsunamis. Information Statements may be re-issued with additional information, though normally these messages are not updated. However, a Watch, Advisory or Warning may be issued for the area, if necessary, after analysis and/or updated information becomes available.

Tsunami Advisory: A Tsunami Advisory is issued by the Tsunami Warning Centers due to the threat of a potential tsunami which may produce strong currents or waves dangerous to those in or near the water. Coastal regions historically prone to damage due to strong currents induced by tsunamis are at the greatest risk. The threat may continue for several hours after the arrival of the initial wave, but significant widespread inundation is not expected for areas under an Advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbors and marinas, and the repositioning of ships to deep waters when there is time to safely do so. Advisories are normally updated to continue the Advisory, expand/contract affected areas, upgrade to a Warning, or cancel the Advisory.

Tsunami Watch: A Tsunami Watch is issued by the Tsunami Warning Centers to alert emergency management officials and the public of an event which may later impact the Watch area. The Watch area may be upgraded to a Warning or Advisory (or canceled) based on updated information and analysis. Therefore, emergency management officials and the public should prepare to take action. Watches are normally issued based on seismic information without confirmation that a destructive tsunami is underway.

Tsunami Warning: A Tsunami Warning is issued by the Tsunami Warning Centers when a potential tsunami with significant widespread inundation is imminent or expected. Warnings alert the public that widespread, dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after arrival of the initial wave. Warnings also alert emergency management officials to take action for the entire tsunami hazard zone. Appropriate actions to be taken by local officials may include the evacuation of low-lying coastal areas, and the repositioning of ships to deep waters when there is time to safely do so. Warnings may be updated, adjusted geographically, downgraded, or canceled. To provide the earliest possible alert, initial warnings are normally based only on seismic information.

Figure 5.1. WC/ATWC procedural chart

| WCATWC-Pacific | | | | | WCATWC-Atlantic | | | | | | | |
|----------------|---|---|---|--|-------------------------------------|---|----------------------------------|--|---|--|--|-----|
| Area | AK, BC, WA, OR, CA ^a | Bering Sea Deep ^a | Arctic O., and Bering Shallow | Not in AOR ^a | East Coast US & Canada ^a | East Coast Inland <400 Mile | Gulf Mex Gulf St. L ^a | Puerto Rico/VI ^a | Not AOR Western Caribbean ^a | Not AOR Eastern Caribbean ^a | Not AOR Atlantic | |
| Mag | | | | | Mag | | | | | | | Mag |
| 4 | | | | | 4 | | | | | | | 4 |
| 5 | TIS*** SEAK71 or SEUS71 | TIS*** SEAK71 | TIS*** SEAK71 | | 5 | TIS*** SEXX60 | TIS*** SEXX60 | TIS*** SEXX60 | TIS*** SEXX60 | TIS*** SEXX60 | | |
| 6 | | | | | 6 | | | | | | | |
| 6.4 | | | | | | | | | | | | |
| 6.5 | TIS WEPA43 and WEAK53 | TIS WEPA43 and WEAK53 | | TIS WEPA43 and WEAK53 | 6.7 | TIS WEXX22 and WEXX32 | TIS WEXX22 and WEXX32 | TIS WEXX22 and WEXX32 | TIS WEXX22 and WEXX32 | TIS WEXX22 and WEXX32 | | |
| 7 | | | | | 6.8 | | | | | | | |
| 7.1 | Warning * 350Km WEPA41 and WEAK51 | Warning * Pribilof/ Aleutian Is. WEPA41 and WEAK51 | TIS WEPA43 and WEAK53 with appropriate Evaluation | | 7.5 | Warning * 350Km WEXX20 and WEXX30 | | Warning * Puerto Rico/ VI WEXX20 and WEXX30 | | | TIS WEXX22 and WEXX32 | |
| 7.5 | | | | | 7.6 | | | | | | | |
| 7.6 | Warning* 1000Km WEPA41/51 | | | TIS WEPA43/53 or Watch/ Warning WEPA41 and WEAK51 | 7.8 | Warning* 1000Km WEXX20/30 | | | | Advisory * PR/VI WEXX20/30 | | |
| 7.8 | | | | | 7.9 | | | | | | | |
| 7.9 | Warning 3W/3W WEPA41/ WEAK51 | | | | | Warning 3W/3W WEXX20/ WEXX30 | | | Advisory * Puerto Rico/ VI WEXX20/30 | Warning* PR/VI WEXX20/30 | TIS/Warning Spec. area WEXX22/32 and WEXX20/30 | |
| 10 | | | | | 10 | | | | | | | 10 |

*** Based on magnitude and distance from the coast.

^a if deeper than 100km and <7.9, use TIS

* No Watch

No TIS for Alaska if less than magnitude 5 and West of 155W

3W/3W => warning for area impacted within 3 hours and watch for area 3 to 6 hours away

TIS = Tsunami Information Statement

WMO product IDs listed under message type

5.4 Message Identifiers

WC/ATWC tsunami bulletins are National Weather Service products. All NWS products are described by both a World Meteorological Organization (WMO) Header and a National Weather Service AWIPS ID. The following table describes the products. For watch, warning, advisory, and information statements (with the WExxxx distribution), there are two products. The standard products (WEPA41, WEPA43, WEXX20, and WEXX22) are segmented within the bulletin with the watch, warning, and information only sections separated by Universal Generic Codes (for watch and warning messages). The new public products (WEAK51, WEAK53, WEXX30, and WEXX32) are in a format intended for the general public and contain action statements and information highlighting the dangers of tsunamis. Experimental web-based products are created and issued by the WC/ATWC to its web site and through RSS feeds. The web-based products are written in an html format with embedded links to related information and are similar in format to the public products.

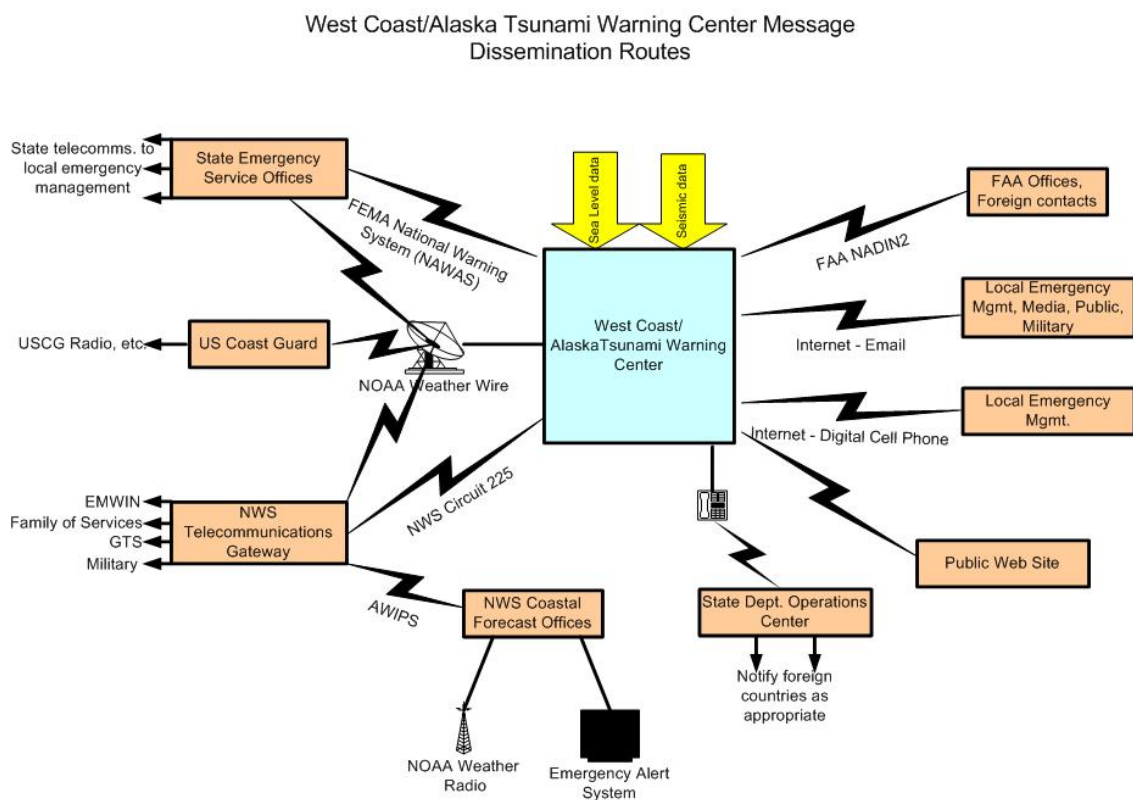
WC/ATWC issues monthly communication test message using the WEPA41 and WEXX20 product headers.

| WMO Header | NWS AWIPS ID | Explanation |
|-------------|--------------|--|
| WEPA41 PAAQ | TSUWCA | Tsunami Warnings, Watches, and Advisories AK, BC, and US West Coast |
| WEPA43 PAAQ | TIBWCA | Information Statements AK, BC, and US West Coast |
| WEAK51 PAAQ | TSUAK1 | “Public” Tsunami Warnings, Watches, and Advisories AK, BC, and US West Coast |
| WEAK53 PAAQ | TIBAK1 | “Public” Information Statements AK, BC, and US West Coast |
| SEAK71 PAAQ | EQIAKX | Information Statements Alaska (M<6.5) |
| SEUS71 PAAQ | EQIWOC | Information Statements BC and US West Coast (M<6.5) |
| WEXX20 PAAQ | TSUAT1 | Tsunami Warnings, Watches, and Advisories PR/VI, US East, Gulf, and Canadian Maritime Provinces |
| WEXX22 PAAQ | TIBAT1 | Information Statements PR/VI, US East, Gulf, and Canadian Maritime Provinces |
| WEXX30 PAAQ | TSUATE | “Public” Tsunami Warnings, Watches, and Advisories PR/VI, US East, Gulf, and Canadian Maritime Provinces |
| WEXX32 PAAQ | TIBATE | “Public” Information Statements PR/VI, US East, Gulf, and Canadian Maritime Provinces |
| SEXX60 PAAQ | EQIAT1 | Information Statements (M<6) PR/VI, US East, Gulf, and Canadian Maritime Provinces |

5.5 Message Dissemination Routes

Message dissemination routes used by the WC/ATWC are summarized in Figure 5.2. Primary routes are the National Warning System (NAWAS), the NOAA Weather Wire (NWS), NWS private circuits to the NWS Telecommunications Gateway, and the Federal Aviation Administration's (FAA) NADIN2 communication system. The NWS Telecommunications Gateway is the conduit to WMO's Global Telecommunications System. Secondary routes are the web site, email, RSS feeds, cell phone text messaging, USGS dissemination systems, and telephone calls.

Figure 5.2 – WC/ATWC message dissemination



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5.6 Example Messages

WC/ATWC Sample messages can be found in the PTWS Operational Users Guide.