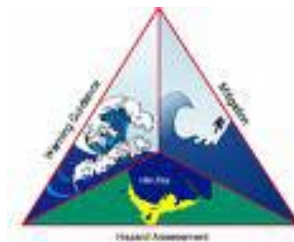
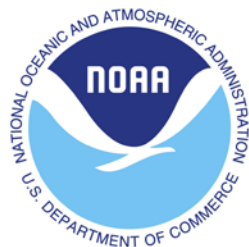


Exercise PACIFEX 11 Participant Handbook

A Pacific tsunami warning exercise:
March 23, 2011

National Tsunami Hazard Mitigation Program
Warning Coordination Subcommittee



NOTE: The contents of this handbook are patterned after the Exercise Pacific Wave 08 manual published by the Intergovernmental Oceanographic Commission. Citation: *Exercise Pacific Wave 08. A Pacific-wide Tsunami Warning and Communication Exercise, 28-30 October 2008*. IOC Technical Series No. 82. Paris, UNESCO, 2008 and the PACIFEX10 handbook.

Exercise

Table of Contents

1. Background.....	1
2. Exercise Concept.....	3
2.1 Purpose.....	3
2.2 Objectives.....	3
2.3 Type of Exercise.....	4
3. Exercise Outline.....	6
3.1 General.....	6
3.2 Master Schedule (Exercise Script).....	7
3.3 Actions in Case of a Real Event.....	8
3.4 Procedure for False Alarm.....	8
3.5 Resources.....	8
3.6 Media Arrangements.....	9
4. Post-Exercise Evaluation.....	9
Appendix A: Example Tabletop Exercise.....	10
Appendix B: Scenario Description.....	12
Appendix C: WCATWC and PTWC Dummy Messages.....	24
Appendix D: WCATWC and PTWC Exercise Messages.....	25
WCATWC Messages	25
PTWC Pacific Messages.....	59
PTWC Hawaii Messages.....	74
Appendix E: Web-based WCATWC Products.....	89
Appendix F: Sample Press Release for Local Media.....	94

Exercise

1. Background

This tsunami exercise is being conducted to assist tsunami preparedness efforts along the U.S. and Canadian Pacific coasts. Historical tsunami records from sources such as the National Oceanic and Atmospheric Administration's (NOAA) National Geophysical Data Center (NGDC) show that approximately 85% of the world's oceanic tsunamis occur in the Pacific Basin and surrounding seas. Tsunamis have impacted U.S. and Canadian Pacific coasts several times in the past century with devastating results. Preparing and exercising emergency response plans throughout this region is an important part of tsunami preparedness.

The PACIFEX11 exercise simulates an earthquake located in the Cascadia subduction zone off the North American Pacific Northwest coast which generates a major tsunami. The description below provides an overview of the region's tectonics.

The **Cascadia subduction zone** (also referred to as the **Cascadia fault**) is a subduction zone, a type of convergent plate boundary, which stretches from northern Vancouver Island to northern California. The subduction zone consists of a very long sloping fault that separates the Juan de Fuca, Explorer, and Gorda plates from the North America plate (Figures 1 and 2). New ocean floor is created at the oceanic ridges located west of the Pacific Northwest coast. As material wells up along the ocean ridge, the ocean floor moves toward and beneath the North American continent at approximately 40mm/year. The Cascadia Subduction Zone is where the two plates meet. Major cities affected by an earthquake in this subduction zone would include Vancouver, Seattle, Portland, and Victoria.

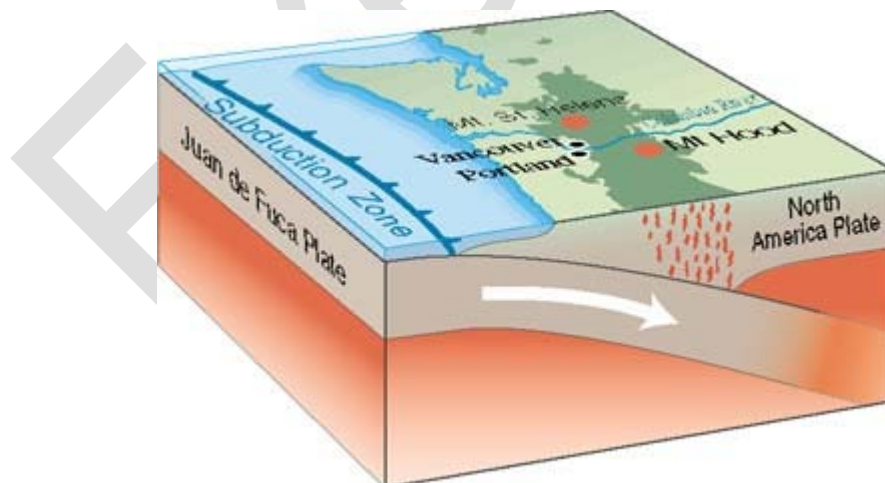
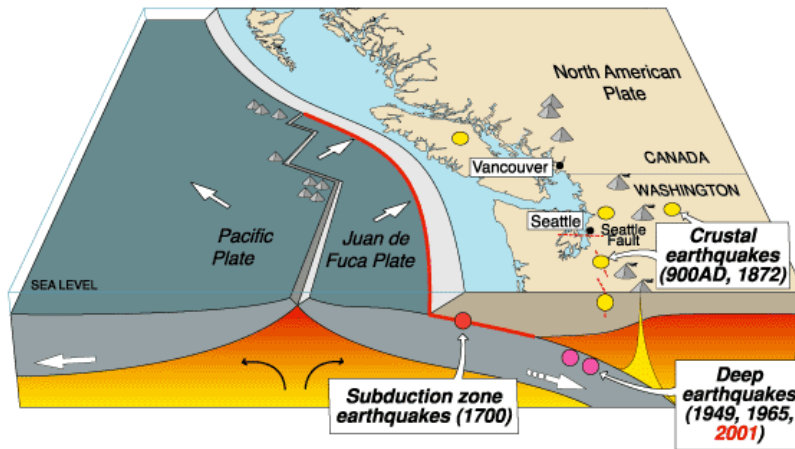


Figure 1. Cross section of the Juan de Fuca plate subduction beneath the North American Plate.

The Cascadia subduction zone runs from triple junctions at its north and south ends. On the north end, just south of Queen Charlotte Island, it intersects the Queen Charlotte Fault and the Explorer Ridge. On the south, just off of Cape Mendocino in California, it intersects the San Andreas Fault and the Mendocino fault zone at the Mendocino Triple Junction.

Cascadia earthquake sources



Source	Affected area	Max. Size	Recurrence
● Subduction Zone	W.WA, OR, CA	M 9	500-600 yr
● Deep Juan de Fuca plate	W.WA, OR,	M 7+	30-50 yr
● Crustal faults	WA, OR, CA	M 7+	Hundreds of yr?

Figure 2. Potential earthquake sources in the Cascadia subduction zone.

The Cascadia subduction zone can produce very large earthquakes ("megathrust earthquakes"), magnitude 9.0 or greater, if rupture occurs over its whole area. Offshore earthquakes of this size typically generate devastating tsunamis. Investigations by the National Tsunami Hazard Mitigation Program state inundation mapping program have shown that a worst case Cascadia earthquake will produce a tsunami capable of inundating communities throughout the Pacific Northwest.

Geologic and historic tsunami studies indicate that the last great earthquake along the Cascadia subduction zone occurred in January of 1700. Geological evidence indicates that great earthquakes may have occurred at least seven times in the last 3,500 years, suggesting a return time of on the average about 500 to 600 years. There is also sedimentary evidence of accompanying tsunamis with every great earthquake, supported by historical records from Japan in 1700.

Contributing articles and sources for the above summary can be found at http://en.wikipedia.org/wiki/Cascadia_subduction_zone .

NOAA operates a tsunami warning system for U.S. Pacific coasts and western Canada through its West Coast/Alaska Tsunami Warning Center (WCATWC) in Palmer, Alaska and the Pacific Tsunami Warning Center (PTWC) in Ewa Beach, Hawaii. These Centers provide tsunami warning, watch, advisory, and information messages approximately five minutes after an earthquake's occurrence for earthquakes in the United States and Canada.

Primary recipients of Tsunami Warning Center (TWC) messages include National Weather Service (NWS) coastal Weather Forecast Offices (WFO), state/territory warning points/emergency operation centers, national Coast Guards, Canada's Provincial Emergency Program, national tsunami warning focal points, and military organizations. These agencies transmit the message to people potentially impacted by a tsunami.

NOAA and the National Tsunami Hazard Mitigation Program (NTHMP) are providing the framework for this exercise as a means for emergency responders along Pacific coasts to test and update tsunami response plans. High levels of vulnerability along the Pacific coast and the well known tsunami threat in the Pacific should provide a strong incentive for local jurisdictions to prepare for a tsunami.

This exercise will provide simulated tsunami warning messages from the WCATWC and PTWC triggered by a hypothetical earthquake located 95 miles west of Eugene, Oregon. Exercises like this will ensure that the U.S./Canadian Pacific coasts are ready to respond in case of a dangerous tsunami. Other recent tsunami exercises in the Pacific and Atlantic Basins have proven effective in strengthening preparedness levels of emergency management organizations.

2. Exercise Concept

2.1 Purpose

The purpose of this exercise is to improve the effectiveness of the tsunami warning system along U.S. and Canadian Pacific coasts. The exercise provides an opportunity for emergency management organizations along these coasts to exercise their operational lines of communications, review their tsunami response procedures, and promote tsunami preparedness. Regular exercising of response plans is critical to maintain readiness for an emergency. This is particularly true for tsunamis which are infrequent, but high impact events. Every U.S. and Canadian Pacific emergency management organization (EMO) is encouraged to participate.

2.2 Objectives

Each organization can develop their objectives for the exercise depending on their level of involvement in the scenario. The following are the exercise's overarching objectives.

- Ensure message transmission from the TWCs through primary contacts to coastal EMOs.
- Test tsunami response plans for those Pacific EMOs that have developed plans, and provide a catalyst for EMOs that have not developed one.

- Coastal EMOs review, discuss, and evaluate the various communication alternatives for receiving and disseminating tsunami messages.
- Coastal EMOs review, discuss, and evaluate potential response actions and challenges.
- Identify processes to issue local all-clear notices.
- Provide an opportunity for EMOs to conduct outreach on earthquake and tsunami response.

2.3 Type of Exercise

The exercise should be carried out such that communications and decision making at various organizational levels are exercised and conducted without disrupting or alarming the general public. Individual localities, however, may at their discretion elect to extend the exercise down to the level of testing local notification systems such as sirens or loudspeakers.

Exercises stimulate the development, training, testing, and evaluation of Disaster Plans and Standard Operating Procedures. Exercise participants may use their own past multi-hazard drills (e.g. flood, hurricane, earthquake, etc.) as a framework to conduct PACIFEX 11.

Exercises can be conducted at various scales of magnitude and sophistication. The following are examples of types of exercises conducted by EMOs.

1. **Orientation Exercise (Seminar):** An Orientation Exercise lays the groundwork for a comprehensive exercise program. It is a planned event, developed to bring together individuals and officials with a role or interest in multi-hazard response planning, problem solving, development of standard operational procedures (SOPs), and resource integration and coordination. An Orientation Exercise will have a specific goal and written objectives and result in an agreed upon Plan of Action.
2. **Drill:** The Drill is a planned activity that tests, develops, and/or maintains skills in a single or limited emergency response procedure. Drills generally involve operational response of single departments or agencies. Drills can involve internal notifications and/or field activities.
3. **Tabletop Exercise:** The Tabletop Exercise is a planned activity in which local officials, key staff, and organizations with disaster management responsibilities are presented with simulated emergency situations. It is usually informal, in a conference room environment, and is designed to elicit constructive discussion from the participants. Participants will examine and attempt to resolve problems, based on plans and procedures, if they exist. Individuals are encouraged to discuss decisions in depth with emphasis on slow-paced problem solving, rather than rapid, real time decision-making. A Tabletop Exercise should have specific goals, objectives, and a scenario narrative (see Appendix A for a Sample Tabletop Exercise Outline).

4. **Functional Exercise:** A Functional Exercise is a planned activity designed to test and evaluate organizational capacities. It is also utilized to evaluate the capability of a community’s emergency management system by testing the Emergency Operations Plan (EOP). It is based on a simulation of a realistic emergency situation that includes a description of the situation (narrative) with communications between players and simulators. The Functional Exercise gives the players (decision-makers) a fully simulated experience of being in a major disaster event. It should take place at the appropriate coordination location (i.e. emergency operations center, emergency command center, command post, master control center, etc.) and activate all the appropriate members designated by the plan. Both internal and external agencies (government, private sector, and volunteer agencies) should be involved. It requires players, controllers, simulators, and evaluators. Message traffic will be simulated and inserted by the control team for player response/actions, under real time constraints. It may or may not include public evacuations. A Functional Exercise should have specific goals, objectives, and scenario narrative.

5. **Full-scale Exercise:** A full-scale Exercise is the culmination of a progressive exercise program that has grown with the capacity of the community to conduct exercises. A Full-Scale exercise is a planned activity in a “challenging” environment that encompasses a majority of the emergency management functions. This type of exercise involves the actual mobilization and deployment of the appropriate personnel and resources needed to demonstrate operational capabilities. EOCs and other command centers are required to be activated. A Full-scale Exercise is the largest, costliest, and most complex exercise type. It may or may not include public evacuations.

Example Time Frames for Different Exercise Types

Style	Planning Period	Duration	Comments
Orientation Exercise	2 wks	1 day	Individual or mixed groups
Drill	2 days	1 day	Individual technical groups generally
Tabletop Exercise	2 weeks	1-3 days	Single or multiple agency
Functional Exercise	1-2 months	1-5 days	Multiple Agency participation
Full-scale Exercise	2-6 months	1 day/ week	Multiple Agency participation

3. Exercise Outline

3.1 General

The scenario will start with a magnitude 9.0 earthquake located 95 miles west of Eugene, Oregon at 44.2°N, 125.0°W. A large tsunami with vertical runups exceeding 5.0 meters near the source zone occurs along U.S. and Canadian Pacific coasts. The earthquake occurs at 1800 UTC on March 23, 2011. The tsunami inundates extensive sections of land in the epicentral region and also significantly impacts other U.S. and Canadian coasts in the Pacific. This is a realistic scenario for a major Cascadian earthquake which is discussed in greater detail in Appendix B.

The TWCs will not issue live messages during the exercise other than to issue an initial “dummy” message over standard communication routes to start the exercise at 1805 UTC on March 23, 2011. The content of the dummy messages is given in Appendix C. The dummy message will indicate that exercise participants should refer to the first message provided in this handbook. From then on, participants should follow the schedule in Table 1 to look at new messages. Table 1 is the timeline for when messages would be issued by the TWCs if this were a real event and should be used by EMOs to drive the exercise timing. The warning messages (as shown in Appendix D) cover a 7 1/2-hour period, though in an actual event they would likely continue longer. World Meteorological Organization (WMO) and Advanced Weather Interactive Processing System (AWIPS) headers used in the dummy message are listed in Table 2.

The WCATWC issues two official products each time a message is issued. The first, and the ones provided in Appendix D, are known as the standard message. This message is a segmented message which includes encoded NWS zones and their level of threat in the lower section of the message. The segmentation is used for automated processing systems which parse NWS products. The standard product also lists expected arrival times. The second product is known as the public message. This message has no segmentation and is written in a non-tabular, easier-to-read format. The products contain the same basic information. EMOs generally use the standard product for warning response as it has more complete information. WCATWC also issues additional graphical and web-based products to its web site. Examples of these are shown in Appendix E.

During Pacific events, PTWC also issues two official products. The first is an international product that covers Hawaii, American Samoa, Guam, and all other countries in the Pacific except Canada. The second is a product specifically for the State of Hawaii. These products are designed and intended for EMOs. Both types of products for this exercise are provided in Appendix D.

Participants may elect to exercise using their own timelines in order to achieve their particular objectives. For example, a particular EMO's exercise

control may choose to feed the TWC bulletins into the exercise at times of their own choosing, or alternatively put them in envelopes with the time they must be opened written on each, with each key participant agency having their own set of envelopes. The messages, provided in Appendix D, will facilitate this approach.

Estimated tsunami arrival times to several U.S. and Canadian Pacific locations are included in the TWC messages (Appendix E contains a list of arrival times to more Pacific locations which would be available over the web during an event as well as a travel time map). In addition, EMOs are welcome to modify estimated arrival times and/or wave amplitudes to suit their exercise – for example, to have the tsunami arrive sooner and with larger amplitude. Other exercise injects, such as tsunami damage reports, are also encouraged.

3.2 Master Schedule (Exercise Script)

Table 1: Scenario Timeline

Tsunami generated by a magnitude 9.0 earthquake with epicenter at 44.2°N, 125.0°W occurring on March 23, 2011 at 1800 UTC.

Date (UTC)	Time (UTC)	WCATWC Message			PTWC Pacific Product			PTWC Hawaii Product		
		#	Type	Dummy	#	Type	Dummy	#	Type	Dummy
03/23/2011	1800	----- Earthquake occurs -----								
03/23/2011	1806	01	WWA	Yes	01	EWW	No	01	WCH	Yes
03/23/2011	1832	02	WWA	No						
03/23/2011	1904	03	WWA	No	02	EWW	No	02	WCH	No
03/23/2011	1935	04	WWA	No						
03/23/2011	2002	05	WWA	No	03	EWW	No	03	WRN	No
03/23/2011	2035	06	WWA	No						
03/23/2011	2104	07	WWA	No	04	EWW	No	04	WRN	No
03/23/2011	2133	08	WWA	No						
03/23/2011	2203	09	WWA	No	05	EWW	No	05	WRN	No
03/23/2011	2236	10	WWA	No						
03/23/2011	2302	11	WWA	No	06	EWW	No	06	WRN	No
03/23/2011	2334	12	WWA	No						
03/24/2011	0004	13	WWA	No	07	EWW	No	07	WRN	No
03/24/2011	0038	14	WWA	No						
03/24/2011	0101	15	WWA	No	08	Can	No	08	Can	No
03/24/2011	0136	16	Can	No						

WCATWC Message Types:

WWA Warning/Watch/Advisory

Can WWA Cancellation

PTWC Pacific Message Types:

EWW Expanding Warning/Watch

Can Warning Cancellation

PTWC Hawaii Message Types:

WCH Tsunami Watch

WRN Tsunami Warning

Can Warning Cancellation

Dummy:

Yes Dummy Issued
 No Dummy Not Issued

Table 2: Product Types

Product Types Issued for Dummy Message with Transmission Methods

Center	WMO ID	AWIPS ID	NWWS	GTS	EMWIN	Fax	Email
WCATWC	WEPA41 PAAQ	TSUWCA	Yes	Yes	Yes	Yes	Yes
PTWC	WEHW40 PHEB	TSUHWX	Yes	Yes	Yes	No	No

NWWS NOAA Weather Wire Service
 GTS Global Telecommunications System
 EMWIN Emergency Manager’s Weather Information Network

3.3 Actions in Case of a Real Event

In the case of a real event occurring during the exercise, TWCs will issue their normal message products for the event. Such messages will be given full priority and a decision will be made by the Centers whether to issue the dummy message and to continue providing telephone support for the exercise. Smaller earthquakes that only trigger a Tsunami Information Statement will not disrupt the exercise. All documentation and correspondence relating to this exercise is to be clearly identified as “PACIFEX 11” and “Exercise.”

3.4 Procedure for False Alarm

Any time disaster response exercises are conducted, the potential exists for the public or media to interpret the event as real. Procedures should be set up by all participating entities to address public or media concerns involving this exercise in case of mis-interpretation by media or the public.

3.5 Resources

Although EMOs will have advance notice of the exercise and may elect to stand up a special dedicated shift to allow normal core business to continue uninterrupted, it is suggested that realistic resource levels be deployed in order to reflect some of the issues that are likely to be faced in a real event.

Questions on the exercise can be addressed to:

Jim Goltz	CA EMA, Tsunami PM	626-356-3810	jim.goltz@oes.ca.gov
Althea Turner	OR OEM Tsunami PM	503-378-2911	Althea.Rizzo@state.or.us
John Schelling	WA EMD Tsunami PM	253-512-7084	j.schelling@emd.wa.gov
Kelli Kryzanowski	BC PEP Tsunami PM	250-952-4989	kelli.kryzanowski@gov.bc.ca
Ervin Petty	AK DHS&EM Tsunami PM	907-428-7015	ervin.petty@alaska.gov
Kevin Richards	HI CD Tsunami PM	808-733-4301	krichards@scd.hawaii.gov
Paul Whitmore	WCATWC Director	907-745-4212	paul.whitmore@noaa.gov
Bill Knight	WCATWC TWSO	907-745-4212	william.knight@noaa.gov
James Waddell	WCATWC Exercise Rep.	907-745-4212	james.waddell@noaa.gov

Chip McCreery	PTWC Director	808-689-8207	charles.mccreery@noaa.gov
Stuart Weinstein	PTWC TWSO	808-689-8207	stuart.weinstein@noaa.gov
Gerard Fryer	PTWC Exercise Rep.	808-689-8207	gerard.fryer@noaa.gov

3.6 Media Arrangements

One advantage in conducting exercises is that it provides a venue to promote awareness of the exercise topic. Many residents along the Pacific coast may not realize that a tsunami warning system exists for their region, let alone the proper response. Communities may wish to invite their local media to the exercise to promote local awareness of the tsunami hazard. Appendix F contains a sample press release which can be adapted as necessary.

NOAA will issue a press release several days before the exercise describing the exercise and its purpose.

4 Post-Exercise Evaluation

All participating agencies are requested to provide brief feedback on the exercise. This feedback will assist the NTHMP and NOAA in the evaluation of PACIFEX 11, the development of subsequent exercises, and help response agencies document lessons learned.

Please provide feedback by April 11, 2011 at the NTHMP internet web site:
<http://nthmp.tsunami.gov/exercise2011.php>.

Appendix A. Example Table Top Exercise

Tabletop Exercise Development Steps

Source: California Emergency Management Agency

A Tabletop Exercise is a planned activity in which local officials, key staff, and organizations with disaster management responsibilities are presented with simulated emergency situations. It is usually informal and slow paced, in a conference room environment, and is designed to elicit constructive discussion from the participants to assess plans, policies, and procedures. Participants will examine and attempt to resolve problems, based on plans and procedures, if they exist. Individuals are encouraged to discuss decisions in depth based on their organization's Standard Operating Procedures (SOPs), with emphasis on slow-paced problem solving, rather than rapid, real time decision-making. An Exercise Controller (moderator) introduces a simulated tsunami scenario to participants via written message, simulated telephone or radio call, or by other means. Exercise problems and activities (injects) are further introduced. Participants conduct group discussions, and resolution is generally agreed upon, and then summarized by a group leader. A Tabletop Exercise should have specific goals, objectives, and a scenario narrative.

The following provides a Tabletop Exercise structure with sample text and example.

1. **Vulnerability Analysis: Problem Statement**

An example for a hurricane might be:

Due to the recent Hurricane incidents that the Southeast region of the United States, an awareness of the threat risk involved in these disasters has become more apparent, therefore the need for evacuation system is vital. The state of Louisiana continues its ongoing tasks of planning, preparing, and training for Hurricane preparedness.

2. **Purpose (Mission): Intent, what you plan to accomplish (Policy Statement)**

An example for a hurricane might be:

The State of Louisiana has realized and recognizes the need for a more efficient and effective evacuation system, and is responding with this Comprehensive Exercise Plan. These events will include seminars, workshops, tabletop exercise, functional and full-scale exercises within an 18-month time frame, under the State Homeland Security grant program.

3. **Scope: Exercise Activities Agencies Involved Hazard Type Geographic Impact Area**

An example might be:

Emergency Services coordinators at local levels of government will identify representative jurisdictions from each of the six mutual aid regions located throughout the State to participate as host jurisdictions in a series of disaster preparedness exercises. These host jurisdictions will develop a progressive series of exercises each type building upon the previous type of exercise. The process will begin with a vulnerability analysis for each jurisdiction and continue through a progression of exercise activities including; orientation seminars,

workshops, tabletop and functional exercises. The eventual objective of these activities will be to reduce disaster impacts to their populations and city infrastructure. All events will be evaluated utilizing US Homeland Security Exercise Evaluation Program (HSEEP) after action reporting (AAR) standards. Steps for corrective actions will be made a part of the after action process and report. Surrounding jurisdictions in the mutual aid area will act as exercise design team members, exercise evaluators, or exercise observers for the purpose of information transfer to increase their operational readiness. Jurisdictions will participate on a rotational basis every two years to provide the opportunity for multiple jurisdiction participation.

4. Goals and Objectives:

Criteria for good objectives: Think SMART

- Simple (concise)
- Measurable
- Achievable (can this be done during the exercise?)
- Realistic (and challenging)
- Task Oriented (oriented to functions)

An example might be:

Comprehensive Exercise Program (CEP) Objectives

- *To improve operational readiness*
- *To improve multi-agency coordination and response capabilities for effective disaster response*
- *To identify communication pathways and problem areas pre-event between local jurisdictions and operational area, regional and state emergency operations centers*
- *To establish uniform methods for resource ordering, tracking and supply for agencies involved at all levels of government.*

5. Narrative:

The Narrative should describe the following:

- Triggering emergency/disaster event
- Describe the environment at the time the exercise begins
- Provides necessary background information
- Prepares participants for the exercise
- Discovery, report: how do you find out?
- Advance notice?
- Time, location, extent or level of damage

6. Evaluation:

The Evaluation should describe the following:

- Objectives Based
- Train Evaluation Teams
- Develop Evaluation Forms

7. After Action Report (AAR): The AAR should be compiled using the evaluation reports

8. Improvement Plan (IP): The IP should reduce vulnerabilities.

Appendix B. Scenario Description

The Alaska Tsunami Forecast Model (ATFM) was used to simulate the tsunami generated by a magnitude 9.0 earthquake 95 miles west of Eugene, Oregon with an epicenter at 44.2N and 125.0W. Other fault parameters are:

Length: 850km
 Width: 100km
 Depth: 2km
 Strike: 345°
 Dip: 13°
 Slip: 90°
 Moment: 3.55×10^{29} dyne-cm

The fault was angled where necessary to follow the curve of the subduction zone, and was assumed to rupture to the north at 2.5km/second.

The model was computed using a 4-minute resolution grid in the open ocean and additional 15-second resolution grids along the U.S./Canadian Pacific coasts region along with finer grids in certain regions.

The following figures display the maximum modeled tsunami amplitude throughout the Pacific and in various regions along the U.S. coast. The amplitude represents the highest level of the tsunami above normal sea level. **Tsunami model results are provided to better understand the scenario and are not intended for evacuation planning.**

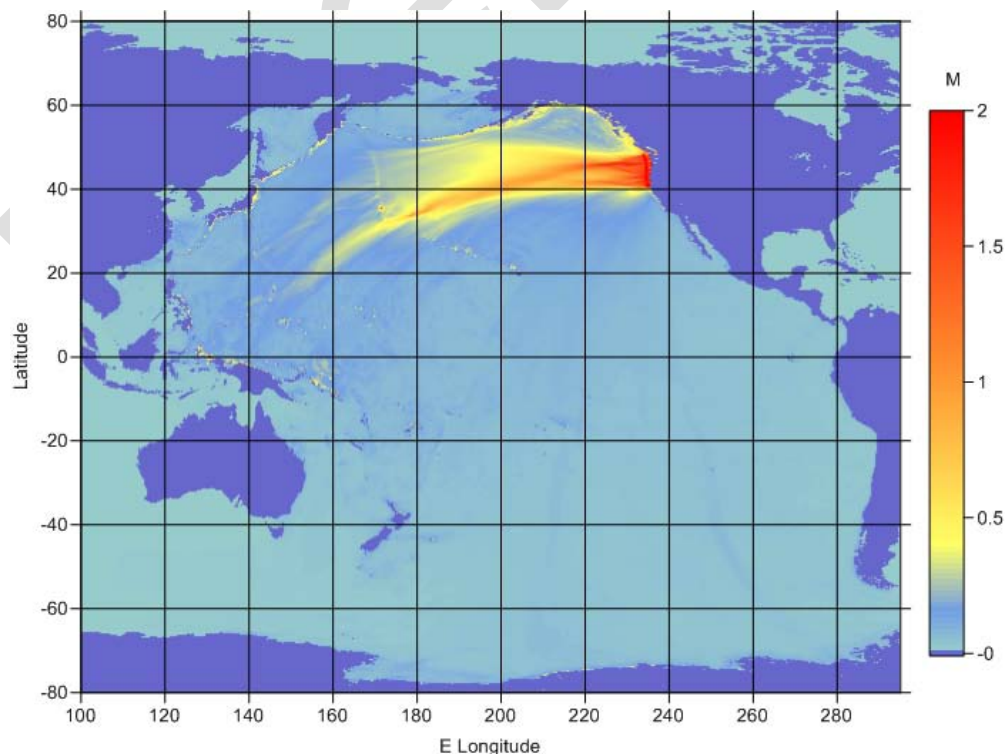


Figure B1: Maximum modeled tsunami amplitudes throughout the Pacific.

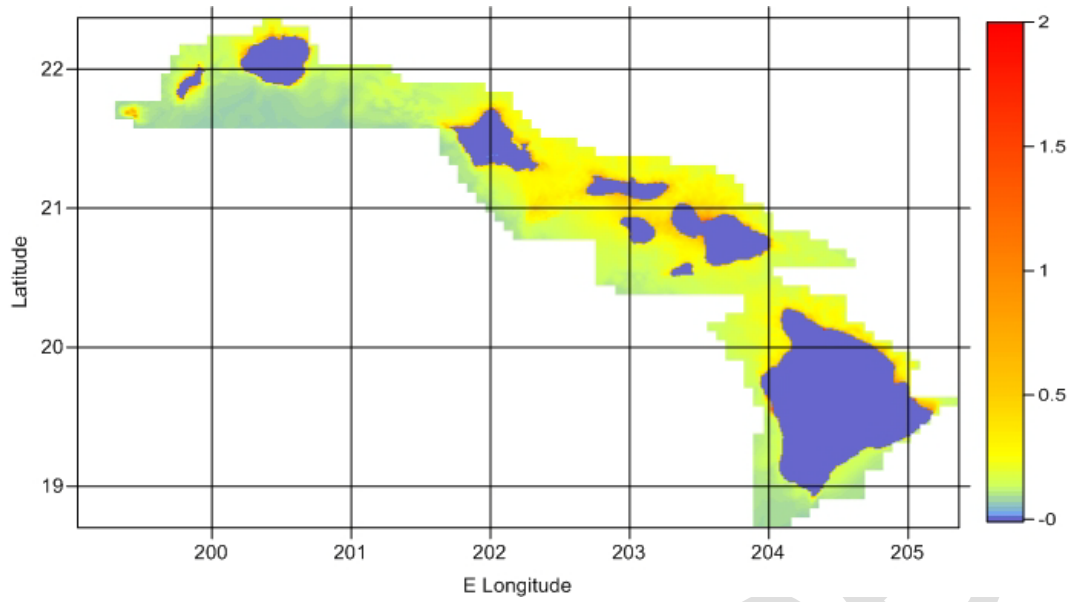


Figure B2. Maximum modeled tsunami amplitudes throughout in the Hawaiian Islands.

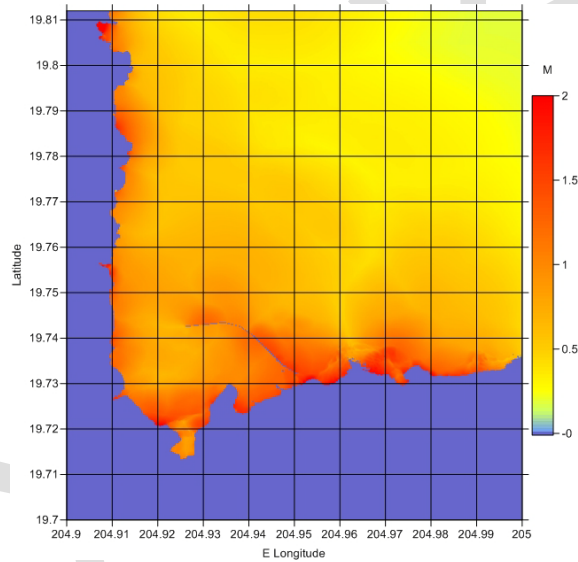


Figure B3. Maximum modeled tsunami amplitudes near Hilo Hawaii.

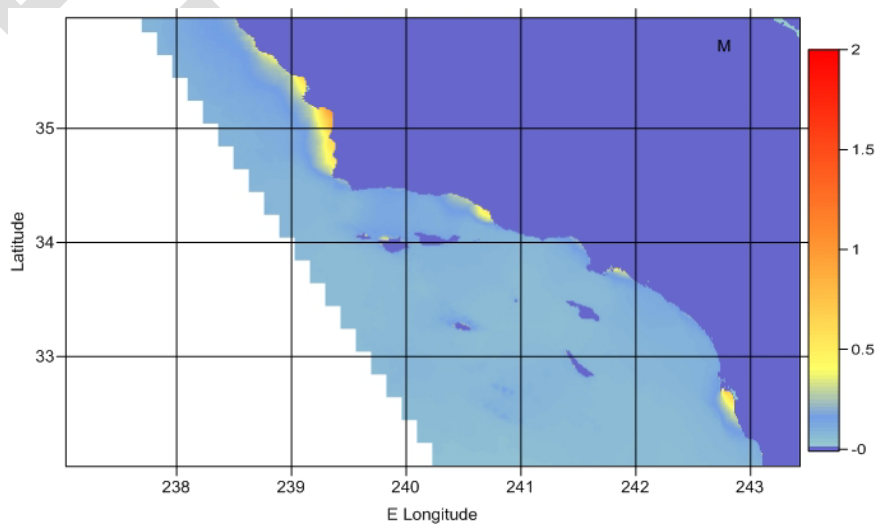


Figure B4. Maximum modeled tsunami amplitudes in Southern California.

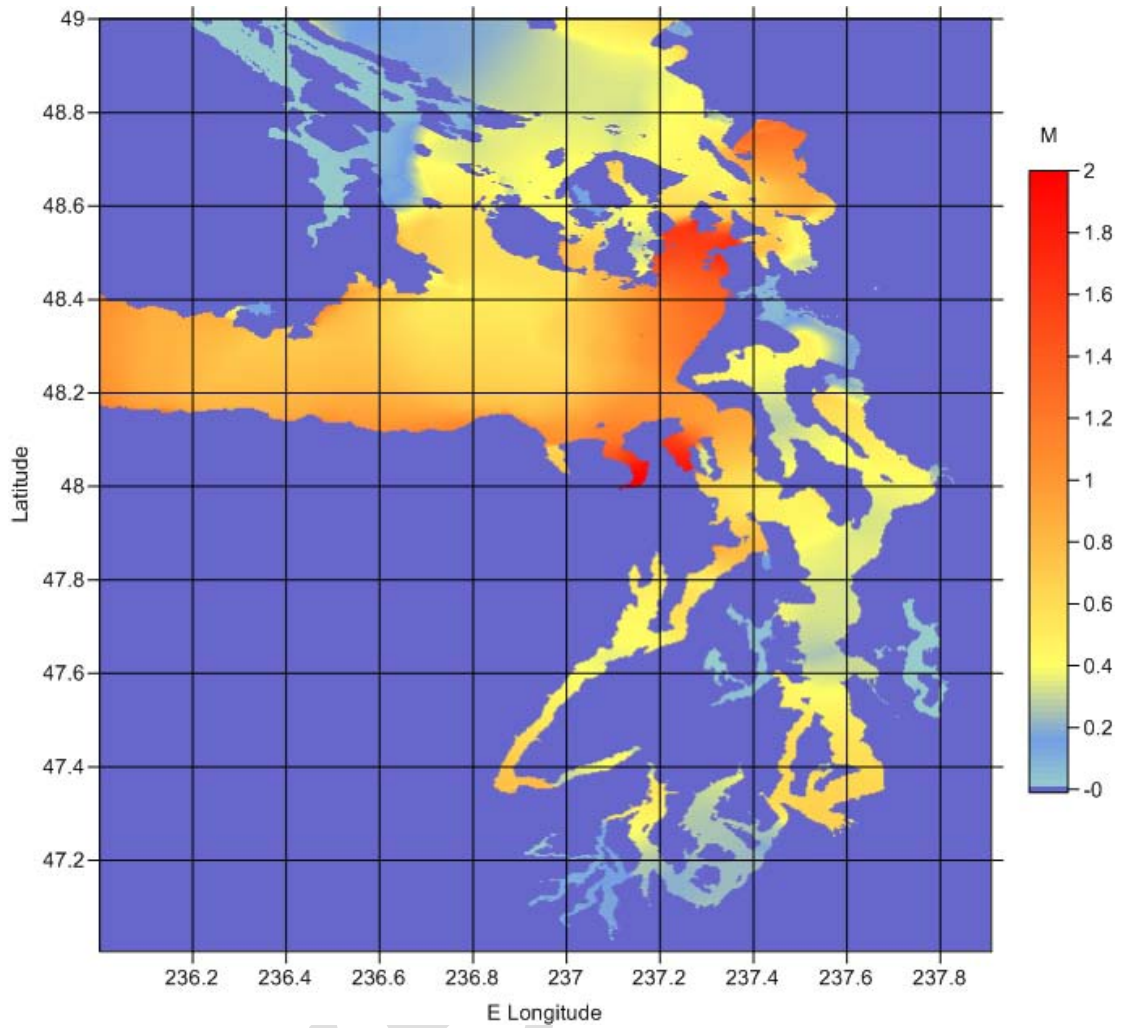


Figure B5. Maximum modeled tsunami in Puget Sound.

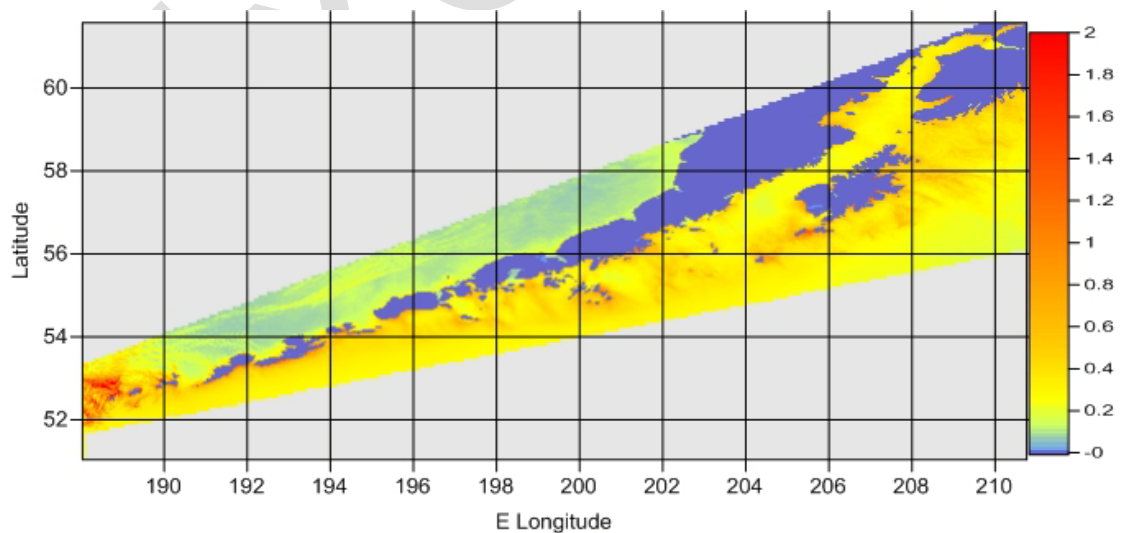


Figure B6. Maximum modeled tsunami amplitudes along the Alaska Peninsula and eastern Aleutian Islands.

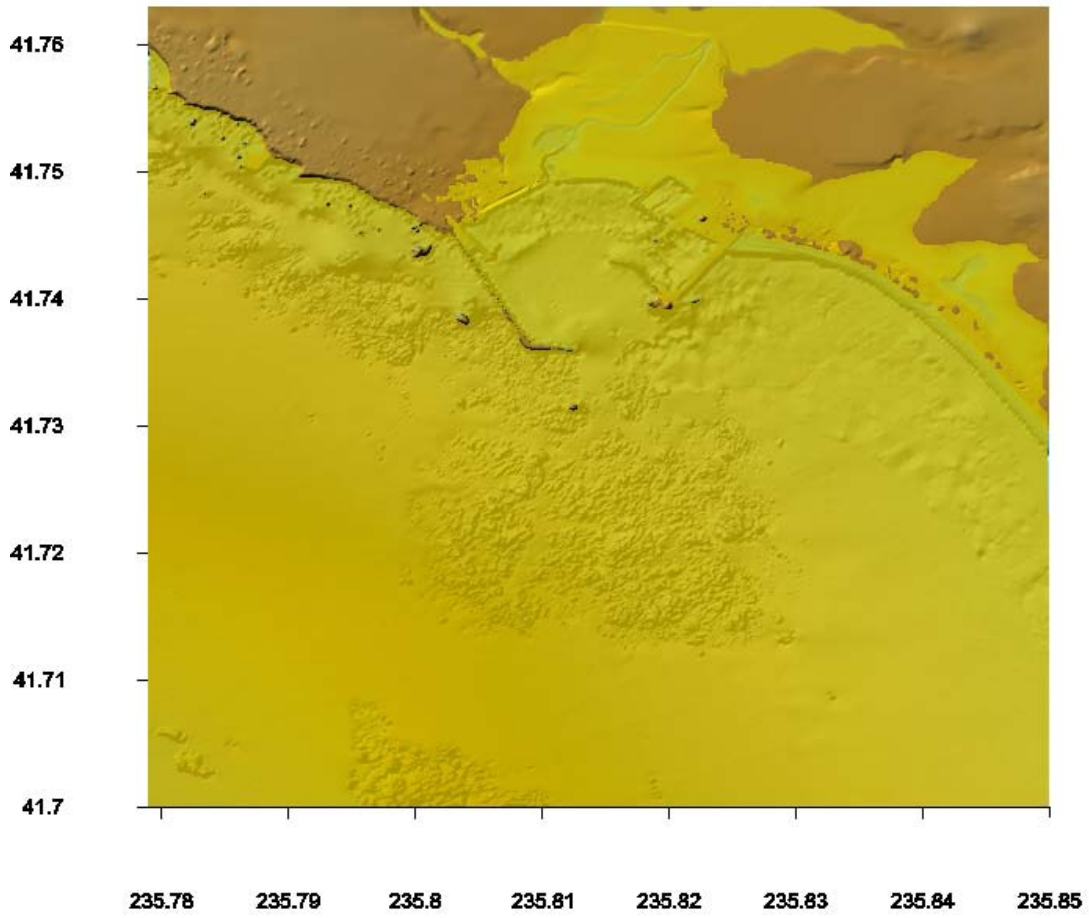


Figure B7. Maximum level of inundation in Crescent City, CA during first four hours of tsunami.

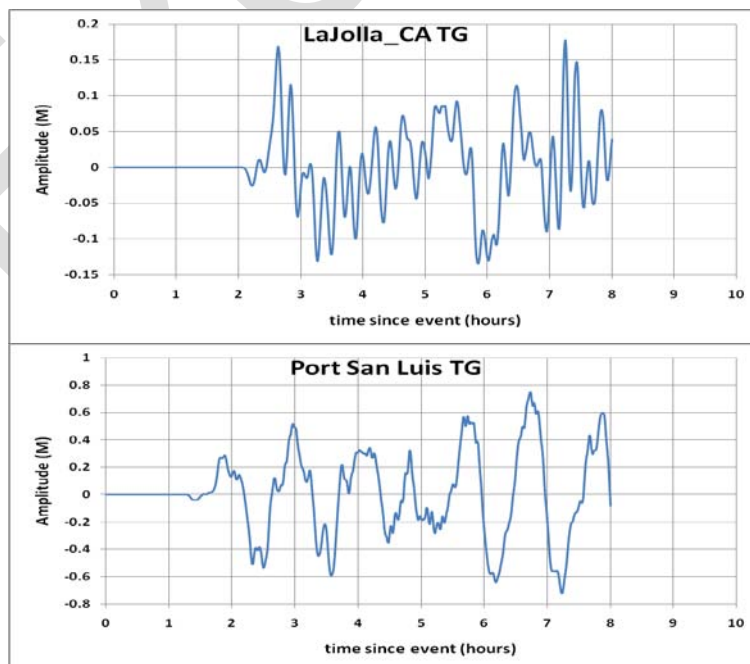
EX-10

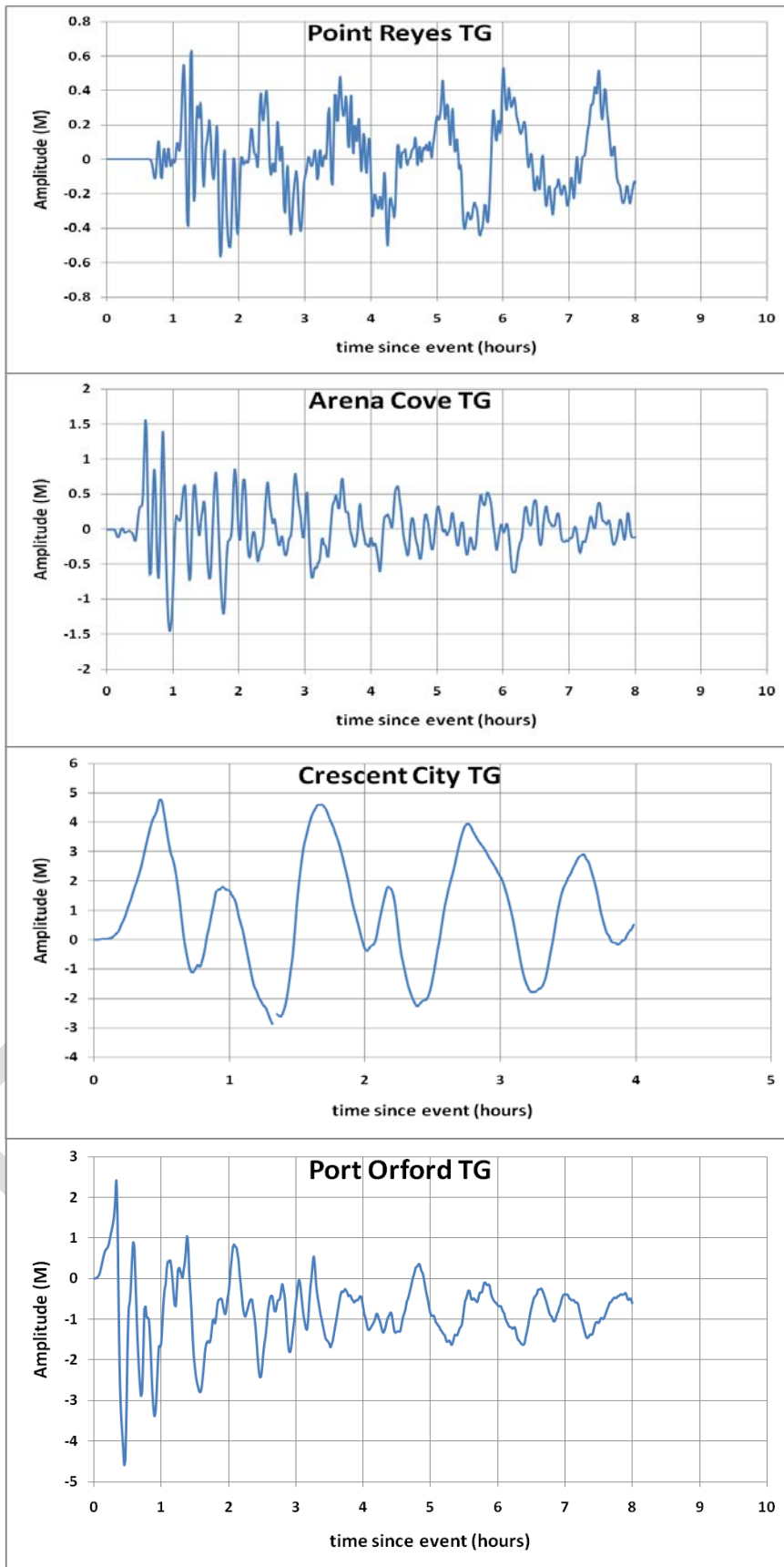
The following table provides maximum modeled amplitudes at several points throughout the exercise area. Amplitude indicates the level of the tsunami above normal sea level at the coast. Coastal amplitudes may induce vertical runups along shore that exceed the forecast amplitude by double or more due to the long period nature of tsunamis.

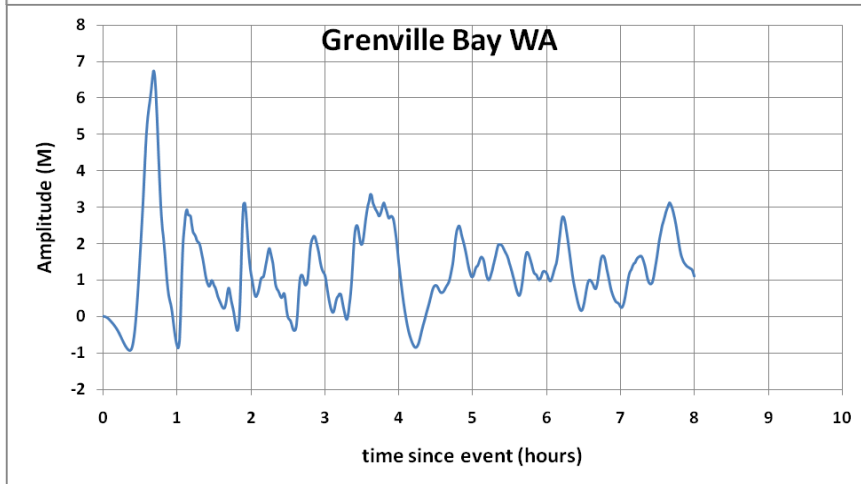
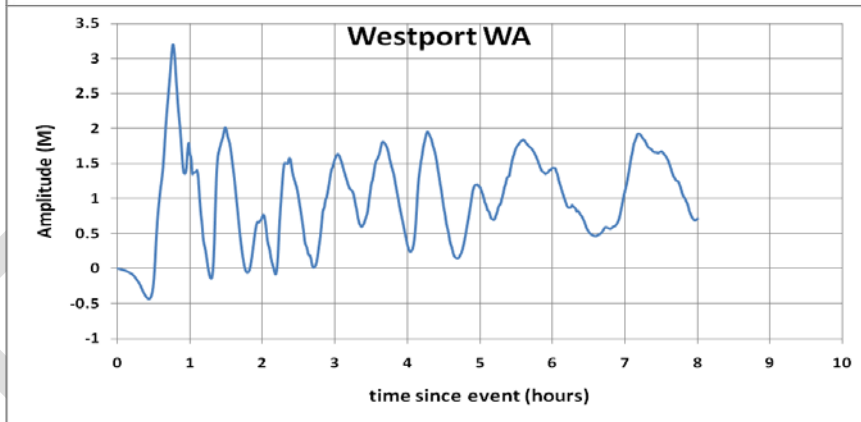
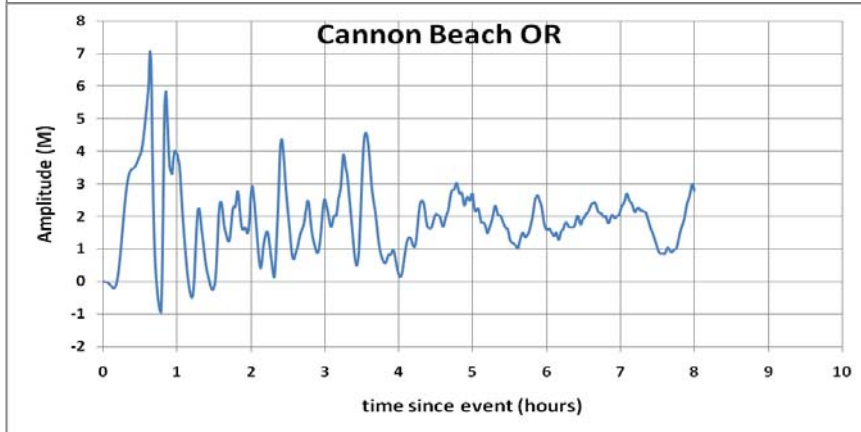
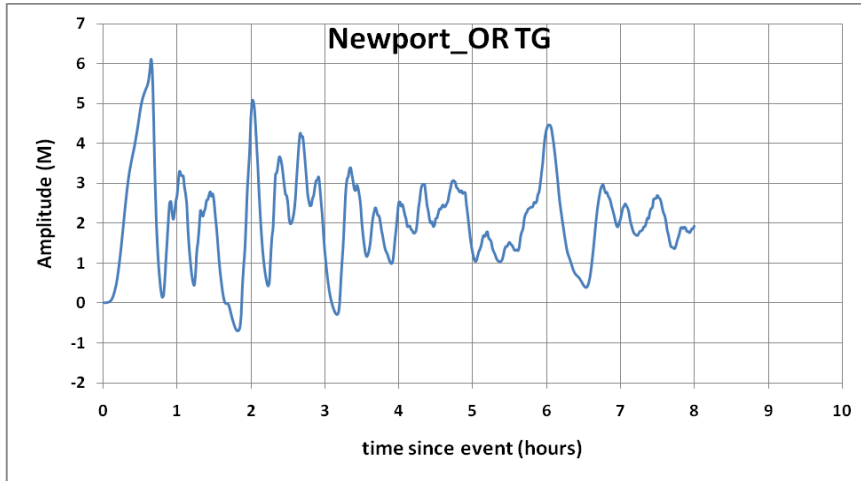
Location	Amplitude (m)	Location	Amplitude (m)
Attu, AK	0.46	Auke Bay, AK	0.24
Karab Cove, AK	0.25	Hoonah, AK	0.34
Alaid I., AK	0.44	Elfin Cove, AK	0.42
Nizki I., AK	0.72	Cape Bingham, AK	0.29
Shemya, AK	0.42	Kruzof I., AK	0.49
False Bay, AK	0.32	Krestof I., AK	0.77
Adak Dock, AK	0.41	Sitka, AK	0.46
Agony Point, AK	0.31	Povorotni, AK	0.55
West Atka I., AK	0.35	Biorka I., AK	0.44
Samalga I., AK	0.55	Langara, BC	0.31
St. Paul, AK	0.15	White Point, BC	0.95
Nikolski, AK	0.48	Cape Scott, BC	0.75
Unalaska, AK	0.48	Matlahaw Point, BC	1.01
Sedanka I., AK	0.70	Tofino, BC	1.66
Akutan, AK	0.16	Neah Bay, WA	1.06
Avatanak I., AK	0.52	Port Angeles, WA	1.10
False Pass, AK	0.22	Bellingham, WA	0.70
Sanak, AK	0.54	Everett, WA	0.15
Cold Bay, AK	0.41	Seattle – Pier 48, WA	0.23
King Cove, AK	0.41	Moclips, WA	3.55
Belkofski, AK	0.54	Westport, WA	0.62
Sand Pt., AK	0.49	Long Beach, WA	3.54
Ivanof Bay, AK	0.77	East Astoria, OR	0.59
Perryville, AK	0.50	Clatsop Spit, OR	3.03
Gull Point, AK	0.50	Cannon Beach, OR	2.79
Kodiak, AK	0.59	Oceanside, OR	3.23
Port Lions, AK	0.69	Neskowin, OR	2.96
Ouzinki, AK	0.51	Siletz, OR	5.38
Selezen Pt., AK	0.62	Newport, OR	2.50
English Bay, AK	0.13	Yachats, OR	3.62
Seldovia, AK	0.23	Siuslaw River Mouth, OR	2.36
Homer Spit, AK	0.18	Umpqua River Mouth, OR	2.57
Halibut Cove, AK	0.21	Empire, OR	1.79
Seward, AK	0.57	Coos Bay, OR	1.64
Whittier, AK	0.30	Charleston, OR	2.12
Montague I., AK	0.32	Bastendorf Beach, OR	2.71
Capr Hinchinbrook, AK	0.51	Coquille Point, OR	3.17
Tatitlek, AK	0.23	Port Orford, OR	2.95
Valdez, AK	0.29	Brookings, OR	2.92
Cordova, AK	0.19	Crescent City, CA	3.61
Icy Bay, AK	0.46	Klamath River Mouth, CA	4.29
Schooner Beach, AK	1.09	Trinidad, CA	3.52
Yakutat dock, AK	1.05	Humboldt Bay, CA	3.32
Eureka, CA	2.22	Carpinteria, CA	0.27
South Spit, CA	3.96	Santa Cruz I., CA	0.08

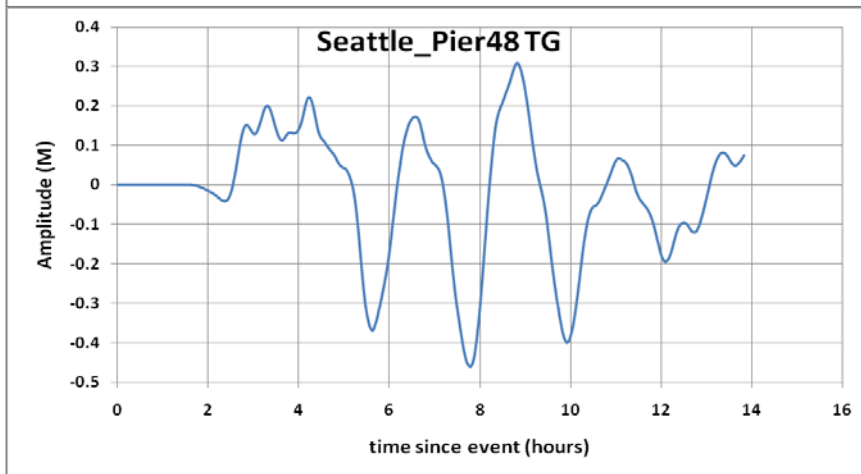
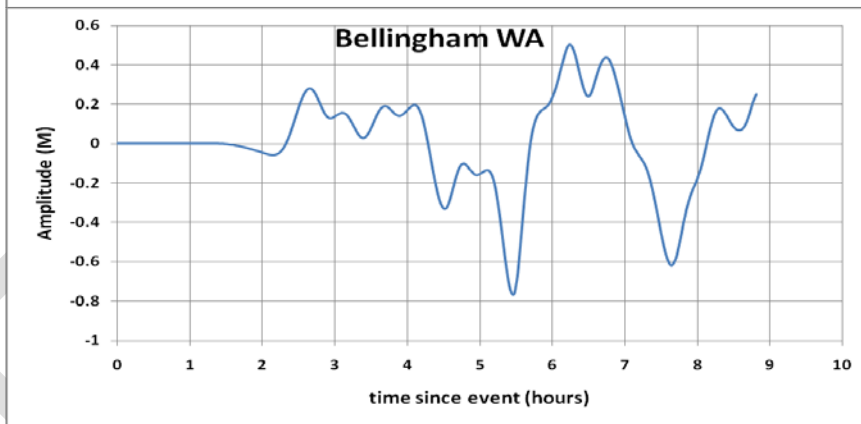
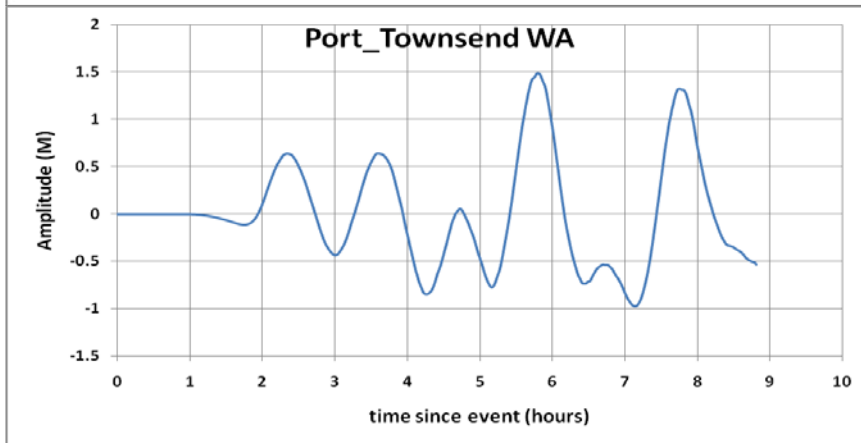
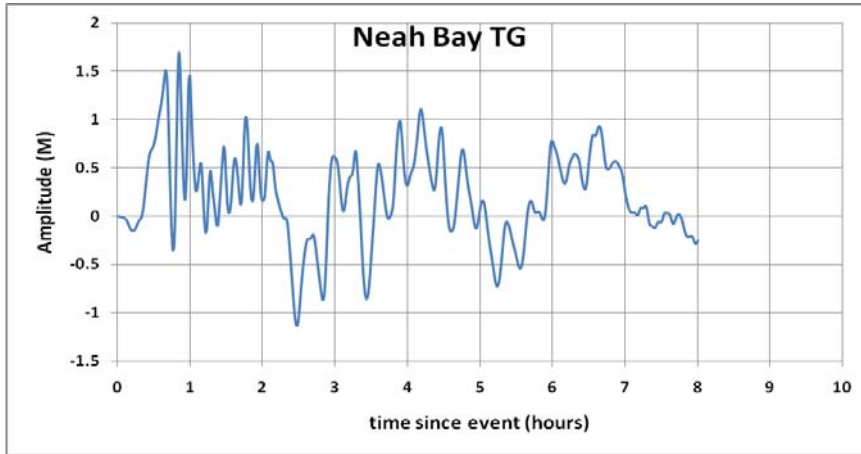
Ten Mile River, CA	1.02	Ventura, CA	0.55
Mendocino, CA	0.78	Malibu, CA	0.20
Elk, CA	1.31	Santa Monica, CA	0.20
Arena Cove, CA	0.77	Redonda Beach, CA	0.14
Bodega Bay, CA	0.77	L.A., CA	0.12
Point Reyes Beach, CA	0.66	Middle Harbor, CA	0.33
Fort Point, CA	0.49	Huntington Beach, CA	0.19
Sausalito, CA	0.25	Laguna Beach, CA	0.17
Alameda, CA	0.19	Encinitas, CA	0.17
Pacifica, CA	0.76	La Jolla, CA	0.21
Half Moon Bay, CA	0.66	Ballast Point, CA	0.20
Rio Del Mar, CA	0.86	San Diego Navy Pier, CA	0.15
Santa Cruz, CA	0.36	North Imperial Beach, CA	0.21
Monterey, CA	0.32	Midway Is.	0.78
Carmel, CA	0.24	Hanalei, HI	0.68
Point Sur, CA	0.36	Nawiliwili, HI	0.65
Morro Bay, CA	0.56	Haleiwa, HI	0.39
Point San Luis, CA	0.52	Moku O Loe I. TG, HI	0.54
Pismo Beach, CA	0.93	Honolulu TG, HI	0.31
Lions Head, CA	0.84	Kalaupapa, HI	0.55
Surf, CA	0.39	Kahului, HI	0.97
Gaviota, CA	0.14	Kihei, HI	0.93
Naples, CA	0.17	Kawaihae, HI	0.75
Santa Barbara, CA	0.23	Hilo TG, HI	0.61

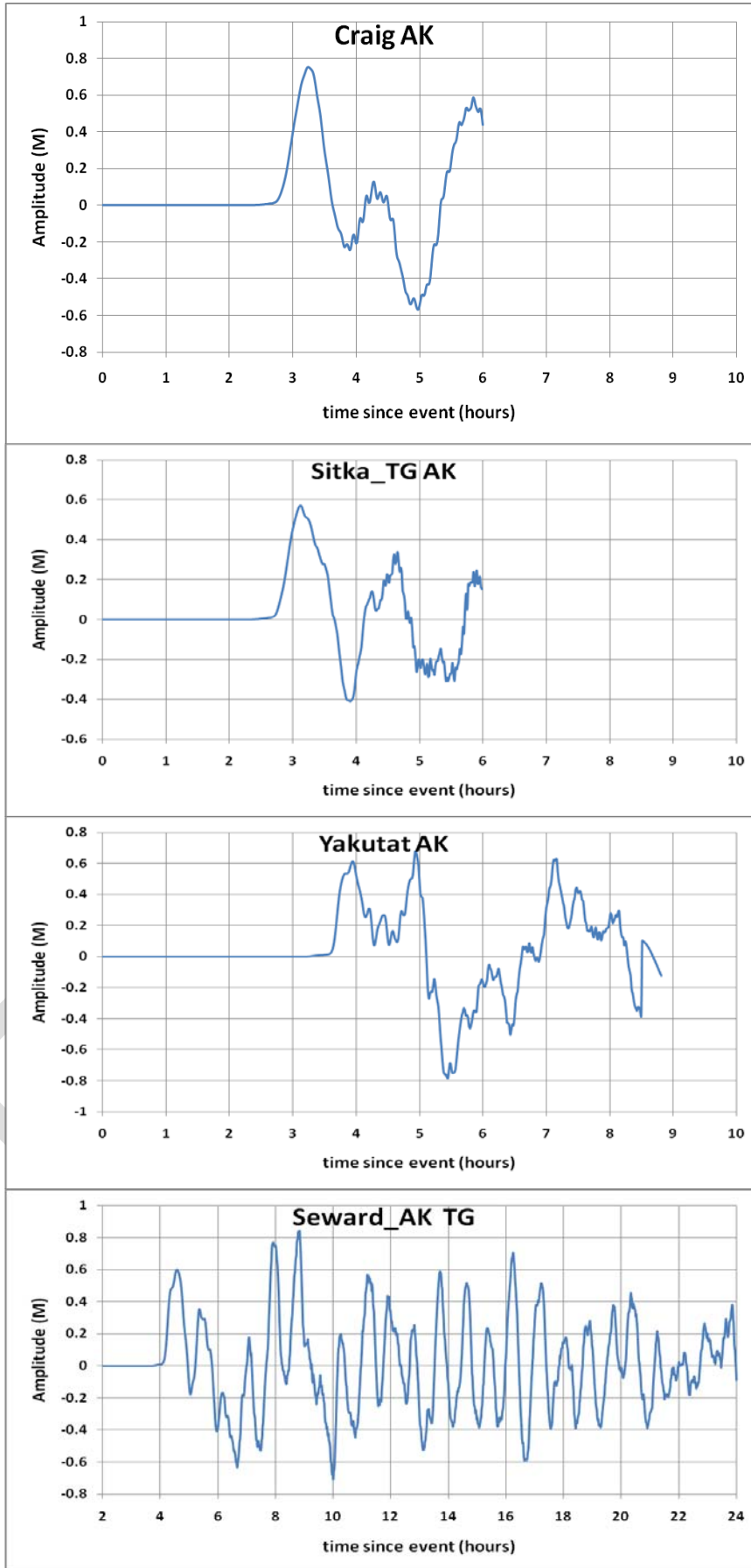
Graphs showing the tsunami variation over time (known as maregrams) are provided below for several sites along the U.S. Pacific coast. Note that the tsunami persists for many hours after initial arrival and that the maximum amplitude often occurs several hours after first arrival.

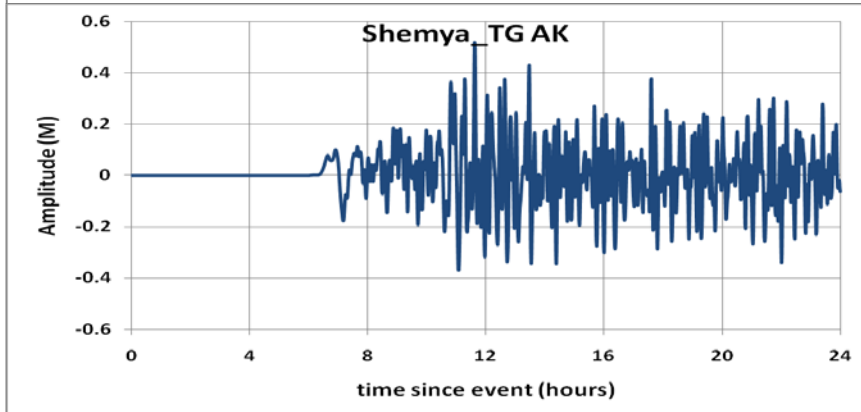
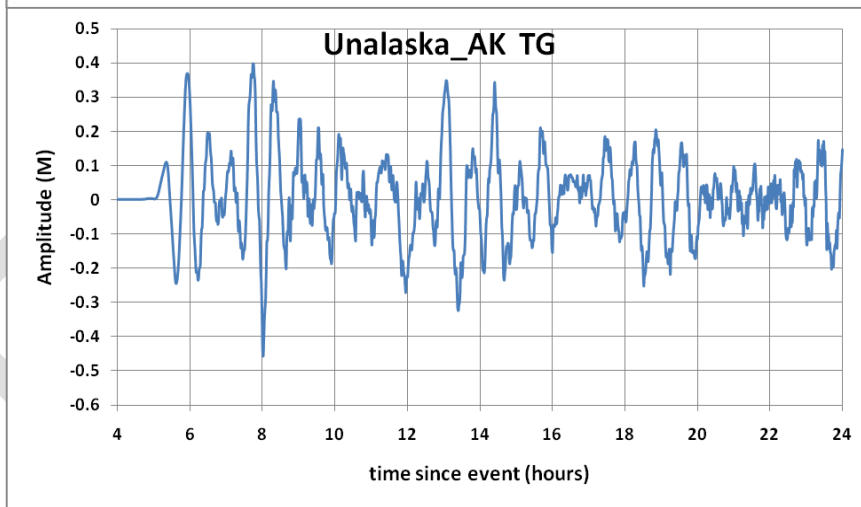
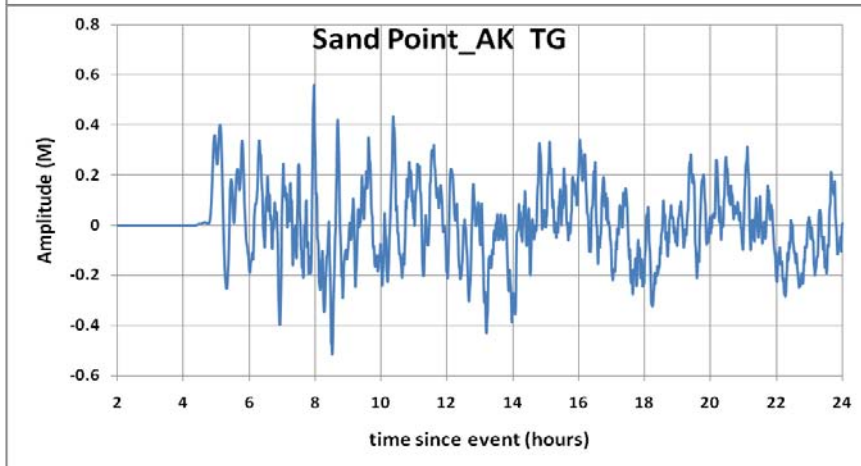
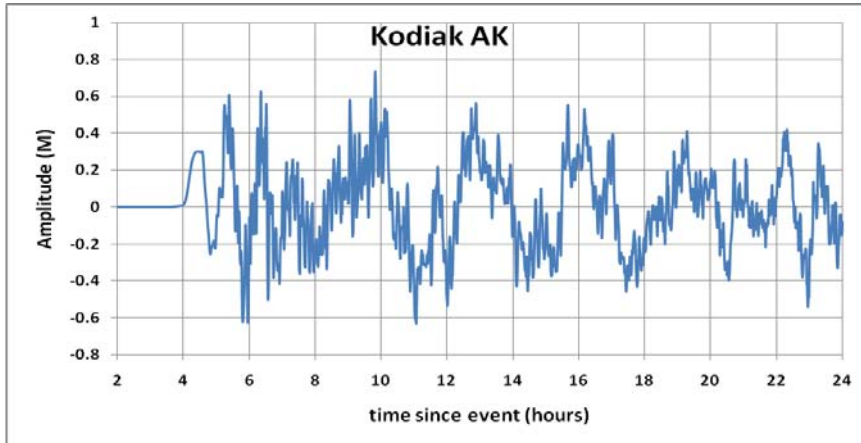












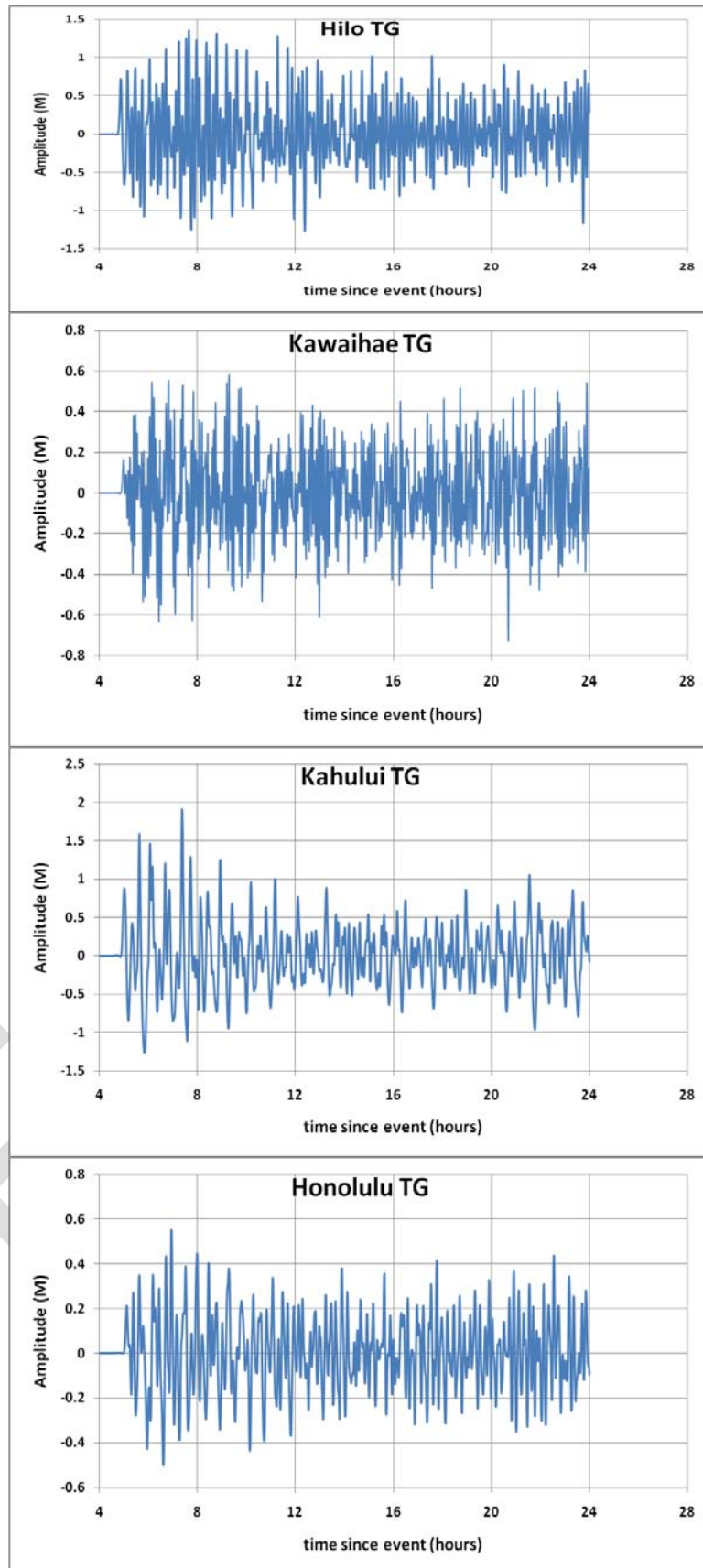


Figure B8. Modeled tsunami heights over time due to the scenario earthquake. TG is an abbreviation for tide gauge. Note that the horizontal and vertical scales are not consistent throughout all graphs.

Appendix C. WCATWC and PTWC Dummy Messages

WCATWC Dummy Message

WEPA41 PAAQ 231805
TSUWCA

TEST...TSUNAMI MESSAGE NUMBER 1...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1105 AM PDT WED MAR 23 2010

...PACIFEX 11 TSUNAMI EXERCISE MESSAGE. REFER TO WCATWC MESSAGE 1 IN THE EXERCISE HANDBOOK. THIS IS AN EXERCISE ONLY...

THIS MESSAGE IS BEING USED TO START OFF THE PACIFEX 11 PACIFIC TSUNAMI EXERCISE. THIS WILL BE THE ONLY EXERCISE MESSAGE TRANSMITTED FROM THE WEST COAST/ALASKA TSUNAMI WARNING CENTER. EXERCISE PARTICIPANTS SHOULD REFER TO THE SCENARIO TIMELINE IN THE HANDBOOK FOR FUTURE MESSAGES. THE HANDBOOK IS AVAILABLE AT THE WEB SITE WCATWC.ARH.NOAA.GOV. THE EXERCISE PURPOSE IS TO PROVIDE EMERGENCY MANAGEMENT A REALISTIC SCENARIO TO TEST TSUNAMI RESPONSE PLANS.

THIS IS ONLY AN EXERCISE.

\$\$

PTWC Dummy Message

WEHW40 PHEB 231805
TSUHWX

TEST...TSUNAMI MESSAGE NUMBER 1...TEST
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
805 AM HST WED MAR 23 2011

...PACIFEX 11 TSUNAMI EXERCISE MESSAGE. REFER TO PTWC MESSAGE 1 IN THE EXERCISE HANDBOOK. THIS IS AN EXERCISE ONLY...

THIS MESSAGE IS BEING USED TO START OFF THE PACIFEX 11 PACIFIC TSUNAMI EXERCISE. THIS WILL BE THE ONLY EXERCISE MESSAGE TRANSMITTED FROM THE PACIFIC TSUNAMI WARNING CENTER. EXERCISE PARTICIPANTS SHOULD REFER TO THE SCENARIO TIMELINE IN THE HANDBOOK FOR FUTURE MESSAGES. THE HANDBOOK IS AVAILABLE AT THE WEB SITE WCATWC.ARH.NOAA.GOV. THE EXERCISE PURPOSE IS TO PROVIDE EMERGENCY MANAGEMENT A REALISTIC SCENARIO TO TEST TSUNAMI RESPONSE PLANS.

THIS IS ONLY AN EXERCISE.

\$\$

Appendix D. WCATWC and PTWC Exercise Messages

WCATWC Messages

The following messages, created for the PACIFEX 11 tsunami exercise, are representative of the official standard products issued by the West Coast and Alaska Tsunami Warning Center during a large magnitude 9.0 earthquake and tsunami originating at 44.2°N, 125.0°W. During a real event, the Center would also issue graphical and html-based products to its web site and via RSS.

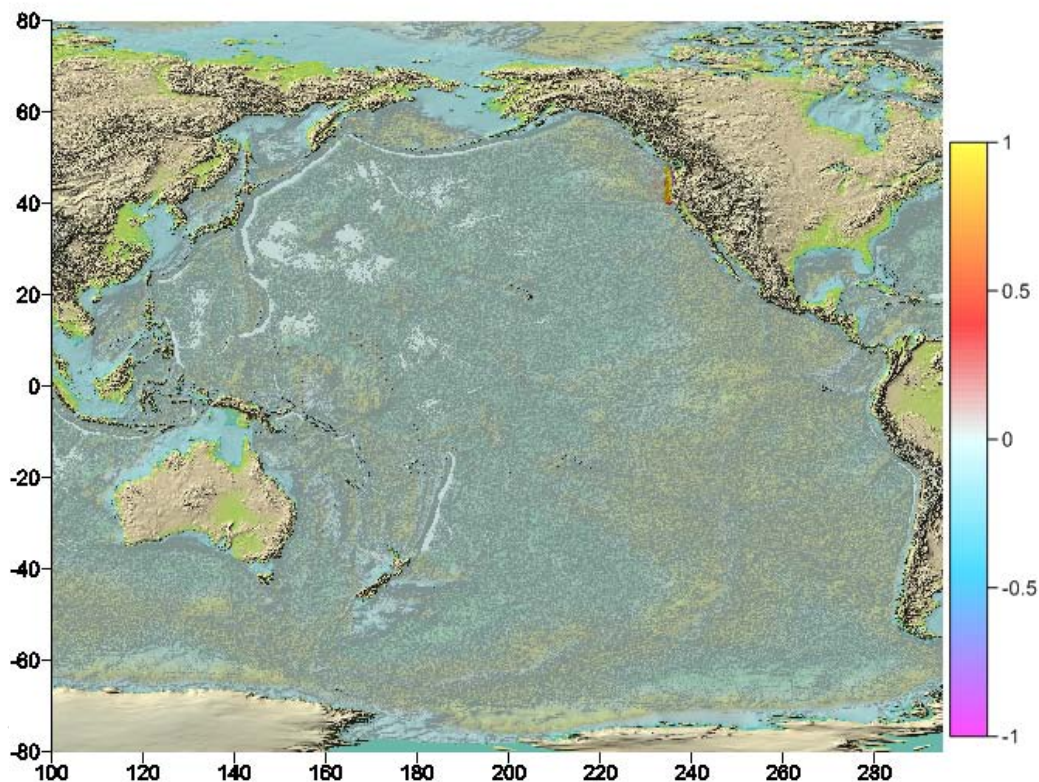


Figure D1. Snapshot of tsunami at time WCATWC bulletin 1 is issued.

WCATWC Message #1

WEPA41 PAAQ 231806
TSUWCA

BULLETIN
TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1106 AM PDT WED MAR 23 2011

...A TSUNAMI WARNING IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH
COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO
CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/...

...A TSUNAMI WATCH IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF ALASKA FROM CAPE FAIRWEATHER ALASKA/80
MILES SE OF YAKUTAT/ TO ATTU ALASKA...

RECOMMENDED ACTIONS

PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.
- PERSONS IN TSUNAMI WATCH AREAS SHOULD STAY ALERT FOR SUPPLEMENTAL INFORMATION.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0
TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

TSUNAMI WATCHES ARE AN ADVANCE NOTICE TO AREAS THAT COULD BE IMPACTED BY A TSUNAMI AT A LATER TIME. WATCH AREAS MAY BE UPGRADED TO WARNING OR ADVISORY STATUS - OR CANCELED - BASED ON NEW INFORMATION OR ANALYSIS. PERSONS IN A WATCH AREA SHOULD CLOSELY FOLLOW SUBSEQUENT TSUNAMI MESSAGES.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE IS BASED MAINLY ON EARTHQUAKE DATA. EARTHQUAKES OF THIS SIZE OFTEN GENERATE DANGEROUS TSUNAMIS. AS MORE INFORMATION BECOMES AVAILABLE THE WARNING AND WATCH AREAS WILL BE REFINED.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-231906
/T.NEW.PAAQ.TS.W.0290.110323T1806Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO BORDER TO CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/
1106 AM PDT WED MAR 23 2011

...A TSUNAMI WARNING IS NOW IN EFFECT WHICH INCLUDES THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL

TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE WARNING ARE PROVIDED BELOW.

CRESCENT CITY-CA	1124	PDT	MAR 23	LANGARA-BC	1307	PDT	MAR 23
CHARLESTON-OR	1133	PDT	MAR 23	SANTA BARBARA-CA	1308	PDT	MAR 23
WESTPORT-WA	1149	PDT	MAR 23	SAN PEDRO-CA	1324	PDT	MAR 23
SEASIDE-OR	1150	PDT	MAR 23	LA JOLLA-CA	1338	PDT	MAR 23
NEAH BAY-WA	1153	PDT	MAR 23	SITKA-AK	1250	AKDT	MAR 23
TOFINO-BC	1208	PDT	MAR 23	ELFIN COVE-AK	1301	AKDT	MAR 23
SAN FRANCISCO-CA	1245	PDT	MAR 23	CRAIG-AK	1318	AKDT	MAR 23

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

\$\$

AKZ017-131-135-125-121-171-181-185-187-191-231906
/T.NEW.PAAQ.TS.A.0290.110323T1806Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING CAPE FAIRWEATHER
ALASKA/80 MILES SE OF YAKUTAT/ TO ATTU ALASKA
1106 AM PDT WED MAR 23 2011

...A TSUNAMI WATCH IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF ALASKA FROM CAPE FAIRWEATHER ALASKA/80
MILES SE OF YAKUTAT/ TO ATTU ALASKA...

PERSONS IN TSUNAMI WATCH AREAS SHOULD STAY ALERT FOR
SUPPLEMENTAL INFORMATION.

TSUNAMI WATCHES ARE AN ADVANCE NOTICE TO AREAS THAT COULD BE
IMPACTED BY A TSUNAMI AT A LATER TIME. TSUNAMIS ARE A SERIES OF
WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED
SITES IN THE WATCH ARE PROVIDED BELOW.

YAKUTAT-AK	1345	AKDT	MAR 23	DUTCH HARBOR-AK	1510	AKDT	MAR 23
SEWARD-AK	1416	AKDT	MAR 23	HOMER-AK	1523	AKDT	MAR 23
KODIAK-AK	1417	AKDT	MAR 23	COLD BAY-AK	1533	AKDT	MAR 23
VALDEZ-AK	1432	AKDT	MAR 23	ADAK-AK	1535	AKDT	MAR 23
CORDOVA-AK	1441	AKDT	MAR 23	SHEMYA-AK	1618	AKDT	MAR 23
SAND PT.-AK	1450	AKDT	MAR 23				

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

\$\$

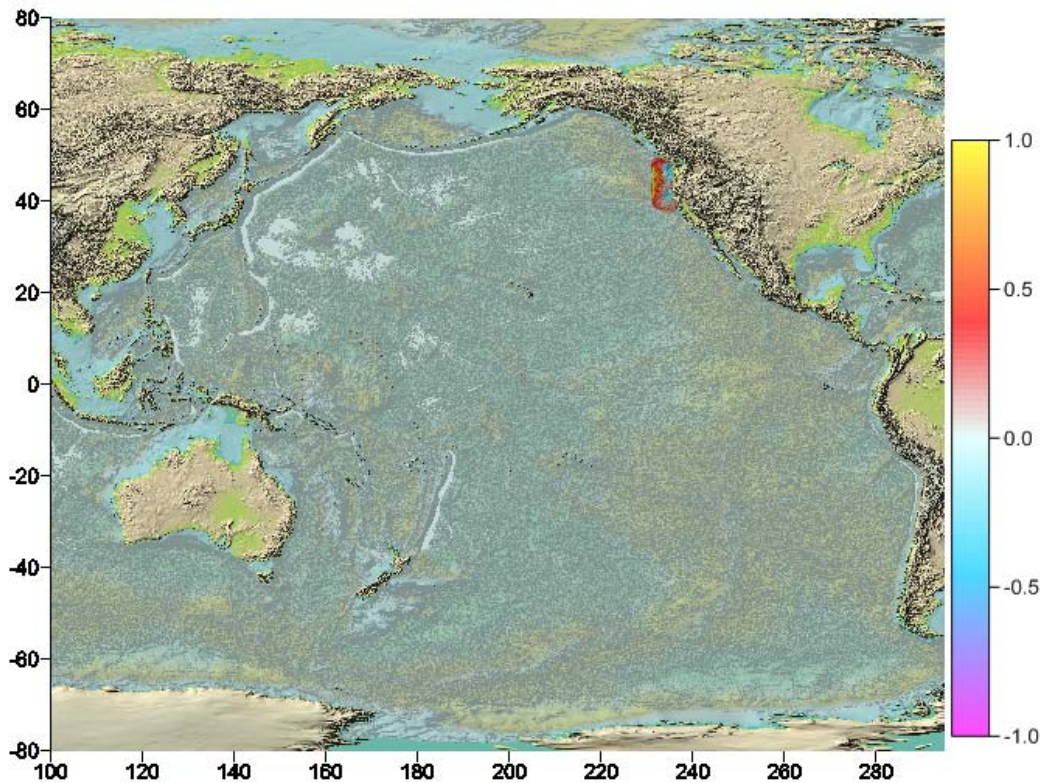


Figure D2. Snapshot of tsunami at time WCATWC bulletin 2 is issued.

WCATWC Message #2

WEPA41 PAAQ 231832
TSUWCA

BULLETIN
TSUNAMI MESSAGE NUMBER 2
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1132 AM PDT WED MAR 23 2011

THE WARNING/WATCH ZONES REMAIN THE SAME. TSUNAMI OBSERVATIONS ARE ADDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/...

...THE TSUNAMI WATCH CONTINUES IN EFFECT FOR THE COASTAL AREAS OF ALASKA FROM CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/ TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.
- PERSONS IN TSUNAMI WATCH AREAS SHOULD STAY ALERT FOR

SUPPLEMENTAL INFORMATION.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
CRESCENT CITY CA	41.7 N	124.2 W	1824UTC	15.75 FT/4.80 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

FORECAST MODELS PROJECT THAT 23FT/7METER WAVES COULD IMPACT ALONG THE WEST COASTS OF BRITISH COLUMBIA - WASHINGTON - OREGON AND NORTHERN CALIFORNIA. WAVES OF THIS SIZE CAN GENERATE EXTENSIVE INUNDATIONS EXTENDING TO MUCH GREATER ELEVATIONS. THE ENTIRE TSUNAMI HAZARD ZONE IS IN DANGER FOR THE COASTAL REGIONS OF BRITISH COLUMBIA - WASHINGTON - OREGON AND NORTHERN CALIFORNIA. TSUNAMIS ARE EXPECTED TO REACH PEAK SIZE ONE TO THREE HOURS AFTER THE EXPECTED ARRIVAL TIME FOR AREAS ON THE OUTER COAST OF THE PACIFIC NORTHWEST AND UP TO SIX HOURS AFTER EXPECTED ARRIVAL TIME IN THE STRAIT OF JUAN DE FUCA AND PUGET SOUND. A 15.75-FOOT/4.80-METER TSUNAMI ALONGWITH STRONG OFFSHORE CURRENTS HAS BEEN REPORTED AT CRESCENT CITY CA. CRESCENT CITY'S SMALL BOAT HARBOR IS CURRENTLY CLOSED TO THE PUBLIC. ITS MAIN PIER HAS BEEN WASHED OUT AND 24 BOATS ARE EITHER DAMAGED BEYOND REPAIR OR HAVE BEEN WASHED OUT TO SEA. 33 PEOPLE ARE REPORTED MISSING.

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 9.0
 TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
 LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
 DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

TSUNAMI WATCHES ARE AN ADVANCE NOTICE TO AREAS THAT COULD BE IMPACTED BY A TSUNAMI AT A LATER TIME. WATCH AREAS MAY BE UPGRADED TO WARNING OR ADVISORY STATUS - OR CANCELED - BASED ON NEW INFORMATION OR ANALYSIS. PERSONS IN A WATCH AREA SHOULD CLOSELY FOLLOW SUBSEQUENT TSUNAMI MESSAGES.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-231932- /T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z/

COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO
BORDER TO CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/
1132 AM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL
AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH
COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO
CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO
HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD
INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF
WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED
SITES IN THE WARNING ARE PROVIDED BELOW.

CRESCENT CITY-CA	1124	PDT MAR 23	LANGARA-BC	1307	PDT MAR 23
CHARLESTON-OR	1133	PDT MAR 23	SANTA BARBARA-CA	1308	PDT MAR 23
WESTPORT-WA	1149	PDT MAR 23	SAN PEDRO-CA	1324	PDT MAR 23
SEASIDE-OR	1150	PDT MAR 23	LA JOLLA-CA	1338	PDT MAR 23
NEAH BAY-WA	1153	PDT MAR 23	SITKA-AK	1250	AKDT MAR 23
TOFINO-BC	1208	PDT MAR 23	ELFIN COVE-AK	1301	AKDT MAR 23
SAN FRANCISCO-CA	1245	PDT MAR 23	CRAIG-AK	1318	AKDT MAR 23

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

\$\$

AKZ017-131-135-125-121-171-181-185-187-191-231932-
/T.CON.PAAQ.TS.A.0290.000000T0000Z-000000T0000Z /
COASTAL AREAS BETWEEN AND INCLUDING CAPE FAIRWEATHER
ALASKA/80 MILES SE OF YAKUTAT/ TO ATTU ALASKA
1132 AM PDT WED MAR 23 2011

...THE TSUNAMI WATCH CONTINUES IN EFFECT FOR THE COASTAL
AREAS OF ALASKA FROM CAPE FAIRWEATHER ALASKA/80 MILES SE OF
YAKUTAT/ TO ATTU ALASKA...

PERSONS IN TSUNAMI WATCH AREAS SHOULD STAY ALERT FOR
SUPPLEMENTAL INFORMATION.

TSUNAMI WATCHES ARE AN ADVANCE NOTICE TO AREAS THAT COULD BE
IMPACTED BY A TSUNAMI AT A LATER TIME. TSUNAMIS ARE A SERIES OF
WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED
SITES IN THE WATCH ARE PROVIDED BELOW.

YAKUTAT-AK	1345	AKDT MAR 23	DUTCH HARBOR-AK	1510	AKDT MAR 23
SEWARD-AK	1416	AKDT MAR 23	HOMER-AK	1523	AKDT MAR 23
KODIAK-AK	1417	AKDT MAR 23	COLD BAY-AK	1533	AKDT MAR 23
VALDEZ-AK	1432	AKDT MAR 23	ADAK-AK	1535	AKDT MAR 23
CORDOVA-AK	1441	AKDT MAR 23	SHEMYA-AK	1618	AKDT MAR 23
SAND PT.-AK	1450	AKDT MAR 23			

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

\$\$

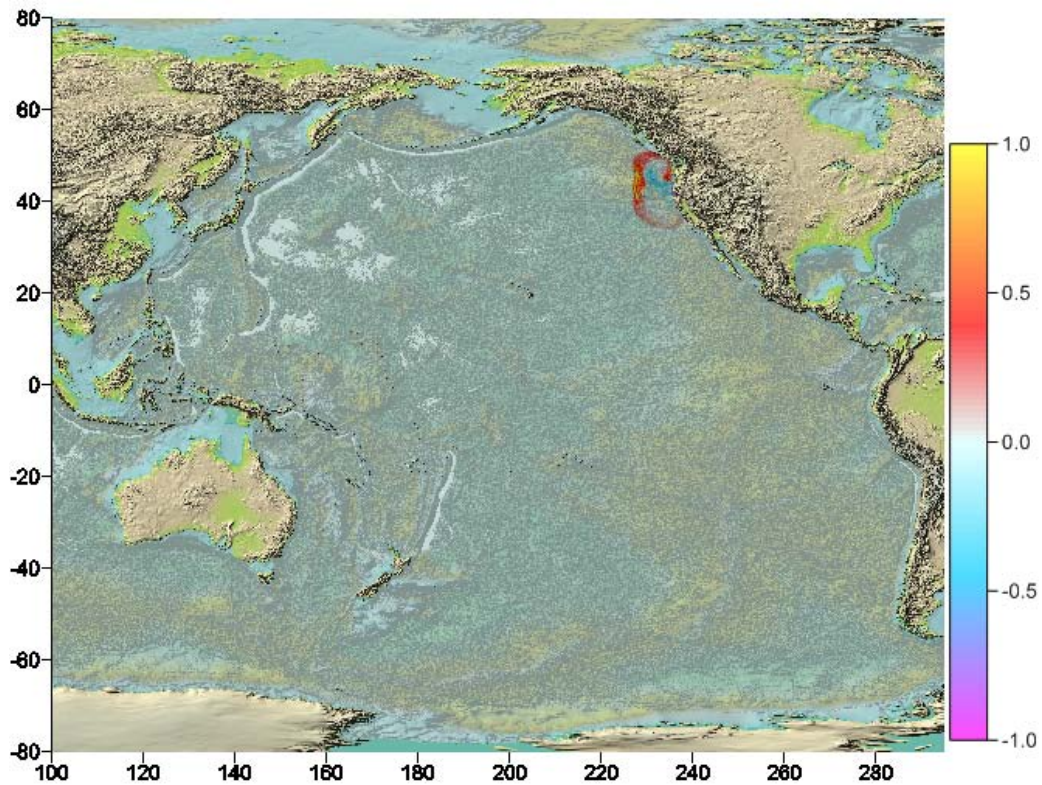


Figure D3. Snapshot of tsunami at time WCATWC bulletin 3 is issued.

WCATWC Message #3

WEPA41 PAAQ 231904
TSUWCA

BULLETIN

TSUNAMI MESSAGE NUMBER 3

NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK

1204 PM PDT WED MAR 23 2011

THE TSUNAMI WARNING IS EXPANDED FROM ATTU ALASKA TO THE CALIFORNIA-MEXICO BORDER. MORE OBSERVATIONS ARE LISTED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/...

...THE TSUNAMI WARNING IS EXPANDED TO INCLUDE THE COASTAL AREAS OF ALASKA FROM CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/ TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
CRESCENT CITY CA	41.7 N	124.2 W	1824UTC	15.75 FT/4.80 M
CHARLESTON OR	43.3 N	124.3 W	1833UTC	11.60 FT/3.55 M
HUMBOLDT BAY CA	40.7 N	124.2 W	1833UTC	2.95 FT/0.90 M
BAYOCEAN PEN OR	45.5 N	123.9 W	1835UTC	20.67 FT/6.30 M
CANNON BEACH OR	45.9 N	124.0 W	1840UTC	23.29 FT/7.10 M
GRENVILLE BAY WA	47.3 N	124.3 W	1842UTC	22.31 FT/6.80 M
NEWPORT OR	44.6 N	124.1 W	1842UTC	20.34 FT/6.20 M
WESTPORT WA	46.9 N	124.1 W	1849UTC	10.83 FT/3.30 M
NEAH BAY WA	48.4 N	124.6 W	1853UTC	5.58 FT/1.70 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

DEEP-WATER PRESSURE SENSORS INDICATE THAT A TSUNAMI HAS BEEN GENERATE AND WILL BE DANGEROUS OUTSIDE THE SOURCE REGION.

FORECAST MODELS PROJECT 3.3FT/1.0-METER TSUNAMIS DEVELOPING IN CENTRAL AND SOUTHERN CALIFORNIA AS WELL AS NORTH OF THE SOURCE REGION IN NORTHERN BC AND ALASKA. IN SOME AREAS THE TSUNAMI CAN AMPLIFY TO TWICE THIS HEIGHT DUE TO LOCAL EFFECTS. WAVES APPROXIMATELY 16 FT/5 M IN HEIGHT HAVE BEEN REPORTED IN CRESCENT CITY CA AND NEWPORT OR. JACK MCNAMARA AIR FIELD IN CRESCENT CITY OR IS CUREENTLY CLOSED DUE TO FLOODING. NEWPORT OR IS REPORTING FLOODING FROM AGATE BEACH GOLF COURSE TO THE NEWPORT MUNICIPLE AIRPORT. THE AIRPORT HAS BEEN CLOSED DUE TO FLOODING. 10 FT/3.1 M TSUNAMIS HAVE BEEN REPORTED IN CHARLESTON OR AND WESTPORT OR. CHARLESTON OR NOTED THAT THE TSUNAMI ENTERED ITS INLET AND FLOODED FROM THE SOUTHWEST OREGON REGIONAL AIRPORT SOUTH TO SOUTH SLOUGH. NEWPORT OR IS REPORTING 32 PEOPLE MISSING AND PRESUMED DEAD AFTER THEY WENT DOWN TO OBSERVE THE SEALIFE ON THE OCEAN FLOOR AS THE WATER DREW OUT PRIOR TO THE TSUNAMI. CRESCENT CITY CA IS REPORTING APPROX \$5 MILLION IN DAMAGE THUS FAR TO ITS SMALL BOAT HARBOR AND SURROUNDING HOMES. CANNON BEACH OR HAS REPORTED THAT WATER HAS INNUNDATED ALL BUILDINGS SEAWARD OF HWY 101 AND THAT HWY 101 IS CURRENTLY CLOSED BETWEEN CANNON BEACH OR AND 3 MILES SOUTH OF ARCH CAPE.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0
 TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
 LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
 DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-

002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-
 250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-
 110-AKZ026>029-023-024-019>022-025-232004-
 /T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z /
 COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO
 BORDER TO CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/
 1204 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL
 AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH
 COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO
 CAPE FAIRWEATHER ALASKA/80 MILES SE OF YAKUTAT/...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO
 HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD
 INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF
 WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
 TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED
 SITES IN THE WARNING ARE PROVIDED BELOW.

CRESCENT CITY-CA	1124	PDT	MAR 23	LANGARA-BC	1307	PDT	MAR 23
CHARLESTON-OR	1133	PDT	MAR 23	SANTA BARBARA-CA	1308	PDT	MAR 23
WESTPORT-WA	1149	PDT	MAR 23	SAN PEDRO-CA	1324	PDT	MAR 23
SEASIDE-OR	1150	PDT	MAR 23	LA JOLLA-CA	1338	PDT	MAR 23
NEAH BAY-WA	1153	PDT	MAR 23	SITKA-AK	1250	AKDT	MAR 23
TOFINO-BC	1208	PDT	MAR 23	ELFIN COVE-AK	1301	AKDT	MAR 23
SAN FRANCISCO-CA	1245	PDT	MAR 23	CRAIG-AK	1318	AKDT	MAR 23

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
 WCATWC.ARH.NOAA.GOV

\$\$

AKZ017-131-135-125-121-171-181-185-187-191-232004-
 /T.CAN.PAAQ.TS.A.0290.000000T0000Z-000000T0000Z /
 /T.EXA.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z /
 COASTAL AREAS BETWEEN AND INCLUDING CAPE FAIRWEATHER
 ALASKA/80 MILES SE OF YAKUTAT/ TO ATTU ALASKA
 1204 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING IS EXPANDED TO INCLUDE THE COASTAL
 AREAS OF ALASKA FROM CAPE FAIRWEATHER ALASKA/80 MILES SE OF
 YAKUTAT/ TO ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO
 HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD
 INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF
 WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
 TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED
 SITES IN THE WARNING ARE PROVIDED BELOW.

YAKUTAT-AK	1345	AKDT	MAR 23	DUTCH HARBOR-AK	1510	AKDT	MAR 23
SEWARD-AK	1416	AKDT	MAR 23	HOMER-AK	1523	AKDT	MAR 23
KODIAK-AK	1417	AKDT	MAR 23	COLD BAY-AK	1533	AKDT	MAR 23
VALDEZ-AK	1432	AKDT	MAR 23	ADAK-AK	1535	AKDT	MAR 23
CORDOVA-AK	1441	AKDT	MAR 23	SHEMYA-AK	1618	AKDT	MAR 23
SAND PT.-AK	1450	AKDT	MAR 23				

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
 WCATWC.ARH.NOAA.GOV

\$\$

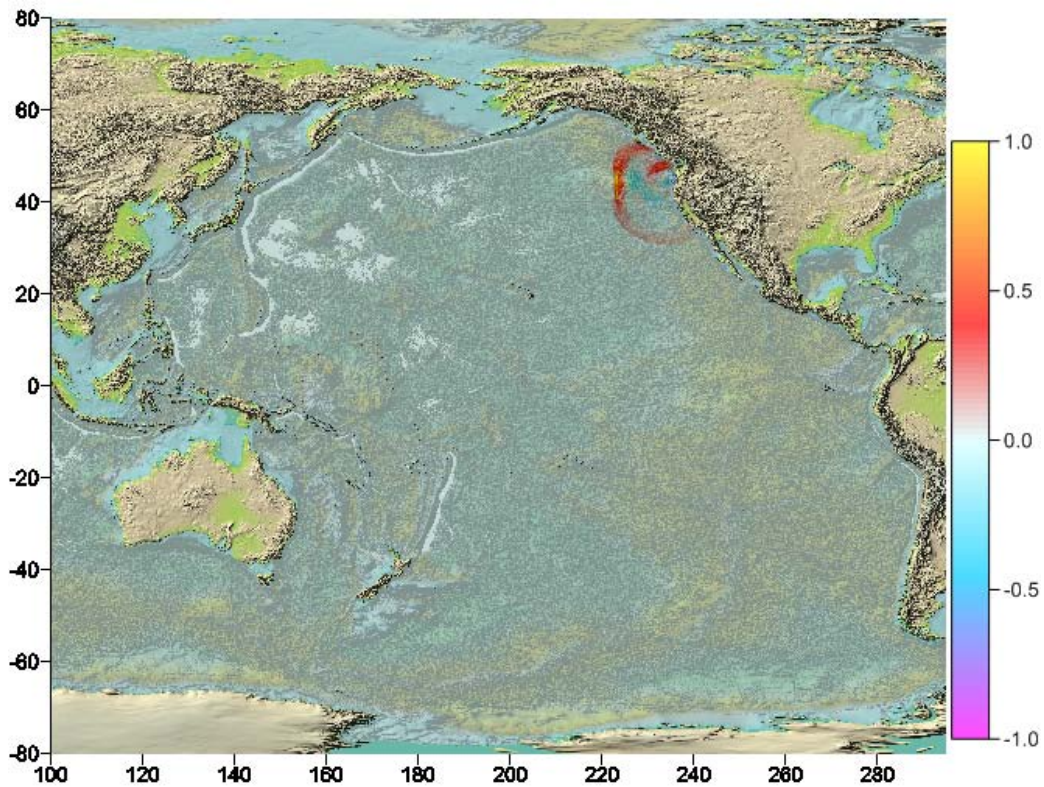


Figure D4. Snapshot of tsunami at time WCATWC bulletin 4 is issued.

WCATWC Message #4

WEPA41 PAAQ 231935
TSUWCA

BULLETIN

TSUNAMI MESSAGE NUMBER 4

NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK

1235 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
CRESCENT CITY CA	41.7 N	124.2 W	1824UTC	15.75 FT/4.80 M
CHARLESTON OR	43.3 N	124.3 W	1833UTC	11.60 FT/3.55 M
HUMBOLDT BAY CA	40.7 N	124.2 W	1833UTC	2.95 FT/0.90 M

BAYOCEAN PEN OR	45.5 N	123.9 W	1835UTC	20.67 FT/6.30 M
CANNON BEACH OR	45.9 N	124.0 W	1840UTC	23.29 FT/7.10 M
GRENVILLE BAY WA	47.3 N	124.3 W	1842UTC	22.31 FT/6.80 M
NEWPORT OR	44.6 N	124.1 W	1842UTC	20.34 FT/6.20 M
WESTPORT WA	46.9 N	124.1 W	1849UTC	10.83 FT/3.30 M
NEAH BAY WA	48.4 N	124.6 W	1853UTC	5.58 FT/1.70 M
EUREKA CA	40.8 N	124.2 W	1902UTC	11.48 FT/3.50 M
TOFINO BC	49.1 N	125.8 W	1908UTC	5.25 FT/1.60 M
ASTORIA OR	46.2 N	123.8 W	1910UTC	3.67 FT/1.12 M
N VANCOUVER I	50.8 N	128.4 W	1913UTC	4.13 FT/1.26 M
PT REYES CA	38.1 N	122.9 W	1915UTC	2.10 FT/0.64 M
MONTEREY CA	36.6 N	121.9 W	1926UTC	0.92 FT/0.28 M
PORT ANGELES WA	48.1 N	123.4 W	1931UTC	2.46 FT/0.75 M

LAT - LATITUDE (N-NORTH, S-SOUTH)

LON - LONGITUDE (E-EAST, W-WEST)

TIME - TIME OF THE MEASUREMENT

AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.

IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.

VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

1.6-4.9 FT/0.5-1.5 METER TSUNAMIS HAVE BEEN REPORTED ALONG THE CENTRAL CALIFORNIA COAST. TOFINO BC REPORTS THAT CANADIAN HWY 4 IS SUBMERGED AND CURRENTLY CLOSED BETWEEN LONG BEACH AND TOFINO. THREE CARS, WITH OCCUPANTS, WERE SWEEPED OFF THIS ROAD AND INTO THE SEA. ALL DRIVERS ARE PRESUMED DEAD. THE TSUNAMI SWEEPED AROUND N VANCOUVER I AND CLOSED THE FRONTAGE ROADS OF PORT HARDY LOCATED ON VANCOUVER I EAST SIDE. ASTORIA OR CITIZENS ARE REPORTING HAVING SEEN A 3.3-FOOT/1.0-METER TIDAL BORE TRAVELING UP THE COLUMBIA RIVER PAST HWY 101. EXTENSIVE DAMAGE HAS BEEN REPORTED TO THE ASTORIA OR PIERS. GRENVILLE BAY WA REPORTS THAT HWY 109 HAS BEEN TOTALLY WASHED AWAY BETWEEN TAHOLAH TO OCEAN SHORES. 19 PEOPLE ARE MISSING AND PRESUMED DROWN.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0

TIME - 1000 AKDT MAR 23 2011

1100 PDT MAR 23 2011

1800 UTC MAR 23 2011

LOCATION - 44.2 NORTH 125.0 WEST

95 MILES/153 KM W OF EUGENE OREGON

150 MILES/241 KM SW OF PORTLAND OREGON

DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-181-185-187-191-232035- /T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z / COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA 1235 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE WARNING ARE PROVIDED BELOW.

WESTPORT-WA	1149	PDT	MAR 23	YAKUTAT-AK	1345	AKDT	MAR 23
SEASIDE-OR	1150	PDT	MAR 23	SEWARD-AK	1416	AKDT	MAR 23
NEAH BAY-WA	1153	PDT	MAR 23	KODIAK-AK	1417	AKDT	MAR 23
TOFINO-BC	1208	PDT	MAR 23	VALDEZ-AK	1432	AKDT	MAR 23
SAN FRANCISCO-CA	1245	PDT	MAR 23	CORDOVA-AK	1441	AKDT	MAR 23
LANGARA-BC	1307	PDT	MAR 23	SAND PT.-AK	1450	AKDT	MAR 23
SANTA BARBARA-CA	1308	PDT	MAR 23	DUTCH HARBOR-AK	1510	AKDT	MAR 23
LA PEDRO-CA	1324	PDT	MAR 23	HOMER-AK	1523	AKDT	MAR 23
LA JOLLA-CA	1338	PDT	MAR 23	COLD BAY-AK	1533	AKDT	MAR 23
SITKA-AK	1250	AKDT	MAR 23	ADAK-AK	1535	AKDT	MAR 23
ELFIN COVE-AK	1301	AKDT	MAR 23	SHEMYA-AK	1618	AKDT	MAR 23
CRAIG-AK	1318	AKDT	MAR 23				

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE WCATWC.ARH.NOAA.GOV

\$\$

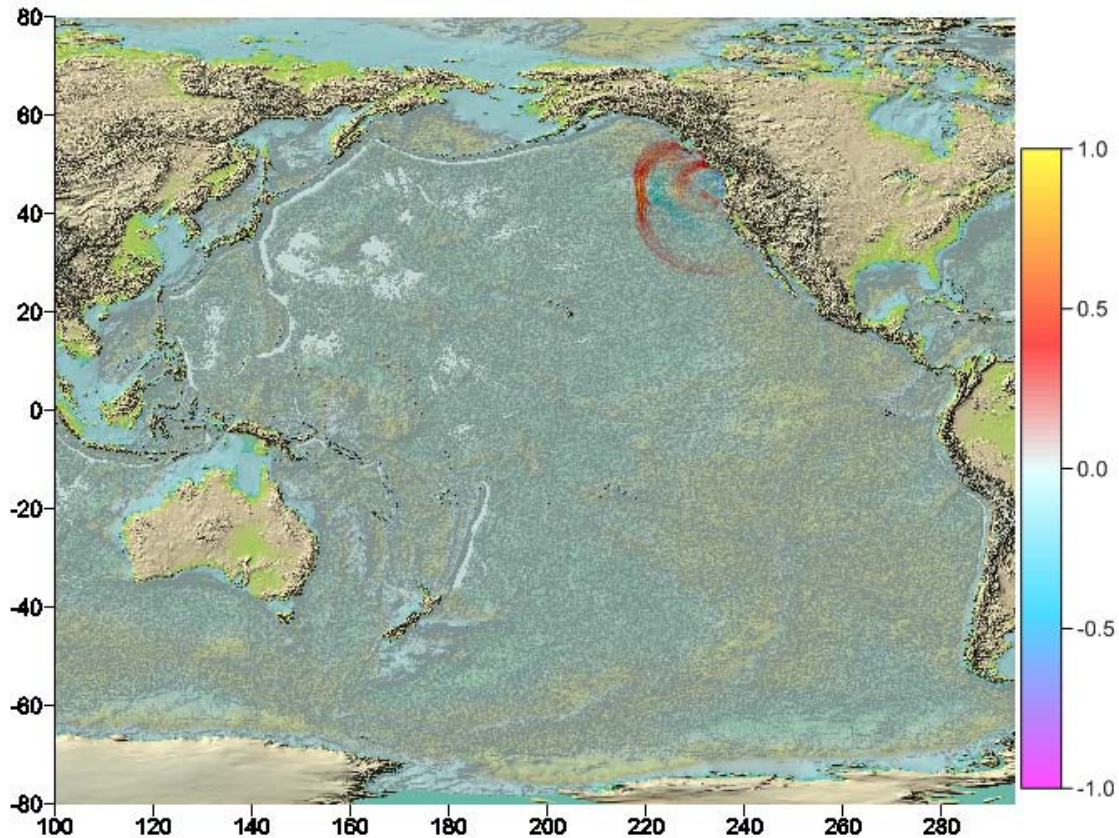


Figure D5. Snapshot of tsunami at time WCATWC bulletin 5 is issued.

WCATWC Message #5

WEPA41 PAAQ 232002
TSUWCA

BULLETIN
TSUNAMI MESSAGE NUMBER 5
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
102 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL
AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH
COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO
ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE
WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING
COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL
EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY
RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO
HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
CRESCENT CITY CA	41.7 N	124.2 W	1824UTC	15.75 FT/4.80 M
CHARLESTON OR	43.3 N	124.3 W	1833UTC	11.60 FT/3.55 M
HUMBOLDT BAY CA	40.7 N	124.2 W	1833UTC	2.95 FT/0.90 M
BAYOCEAN PEN OR	45.5 N	123.9 W	1835UTC	20.67 FT/6.30 M
CANNON BEACH OR	45.9 N	124.0 W	1840UTC	23.29 FT/7.10 M
GRENVILLE BAY WA	47.3 N	124.3 W	1842UTC	22.31 FT/6.80 M
NEWPORT OR	44.6 N	124.1 W	1842UTC	20.34 FT/6.20 M
WESTPORT WA	46.9 N	124.1 W	1849UTC	10.83 FT/3.30 M
NEAH BAY WA	48.4 N	124.6 W	1853UTC	5.58 FT/1.70 M
EUREKA CA	40.8 N	124.2 W	1902UTC	11.48 FT/3.50 M
TOFINO BC	49.1 N	125.8 W	1908UTC	5.25 FT/1.60 M
ASTORIA OR	46.2 N	123.8 W	1910UTC	3.67 FT/1.12 M
N VANCOUVER I	50.8 N	128.4 W	1913UTC	4.13 FT/1.26 M
PT REYES CA	38.1 N	122.9 W	1915UTC	2.10 FT/0.64 M
MONTEREY CA	36.6 N	121.9 W	1926UTC	0.92 FT/0.28 M
PORT ANGELES WA	48.1 N	123.4 W	1931UTC	2.46 FT/0.75 M
PORT SAN LUIS CA	35.2 N	120.8 W	1952UTC	0.92 FT/0.28 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

PORT ANGELES WA REPORTS ITS COAST GUARD AIR STATION WAS INUNDATED AND IS
CURRENTLY NOT OPERATIONAL. PORT ANGELES WA OLYMPIC MEMORIAL HOSPITALS FIRST
FLOOR IS CURRENTLY FLOODED AND ALL PATIENTS HAVE BEEN MOVED TO THE UPPER
LEVELS. THREE PEOPLE AT THE HOSPITAL WERE REPORTEDLY KILLED FROM BEING
SWEEPED OFF THEIR FEET FROM THE WAVE SURGE. THE TSUNAMI AT PT REYES CA
COVERED THE SAND SPIT AT ESTERO LE LIMANTOUR JUST INSIDE DRAKES BAY. ONE
PERSON IS REPORTED TO HAVE DROWN AT THE COAST CAMPGROUND IN DRAKES BAY.
TOKELAND WA REPORTS VIA GRENVILLE BAY WA THAT ALL COMMUNICATIONS ARE
CURRENTLY NOT WORKING AND THAT THE ENTIRE SPIT THAT TOKELAND IS ON WAS
INUNDATED.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0
 TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
 LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
 DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-181-185-187-191-232102- /T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z / COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA
 102 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE WARNING ARE PROVIDED BELOW.

TOFINO-BC	1208	PDT MAR 23	SEWARD-AK	1416	AKDT MAR 23
SAN FRANCISCO-CA	1245	PDT MAR 23	KODIAK-AK	1417	AKDT MAR 23
LANGARA-BC	1307	PDT MAR 23	VALDEZ-AK	1432	AKDT MAR 23
SANTA BARBARA-CA	1308	PDT MAR 23	CORDOVA-AK	1441	AKDT MAR 23
SAN PEDRO-CA	1324	PDT MAR 23	SAND PT.-AK	1450	AKDT MAR 23
LA JOLLA-CA	1338	PDT MAR 23	DUTCH HARBOR-AK	1510	AKDT MAR 23
SITKA-AK	1250	AKDT MAR 23	HOMER-AK	1523	AKDT MAR 23
ELFIN COVE-AK	1301	AKDT MAR 23	COLD BAY-AK	1533	AKDT MAR 23
CRAIG-AK	1318	AKDT MAR 23	ADAK-AK	1535	AKDT MAR 23
YAKUTAT-AK	1345	AKDT MAR 23	SHEMYA-AK	1618	AKDT MAR 23

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE WCATWC.ARH.NOAA.GOV

\$\$

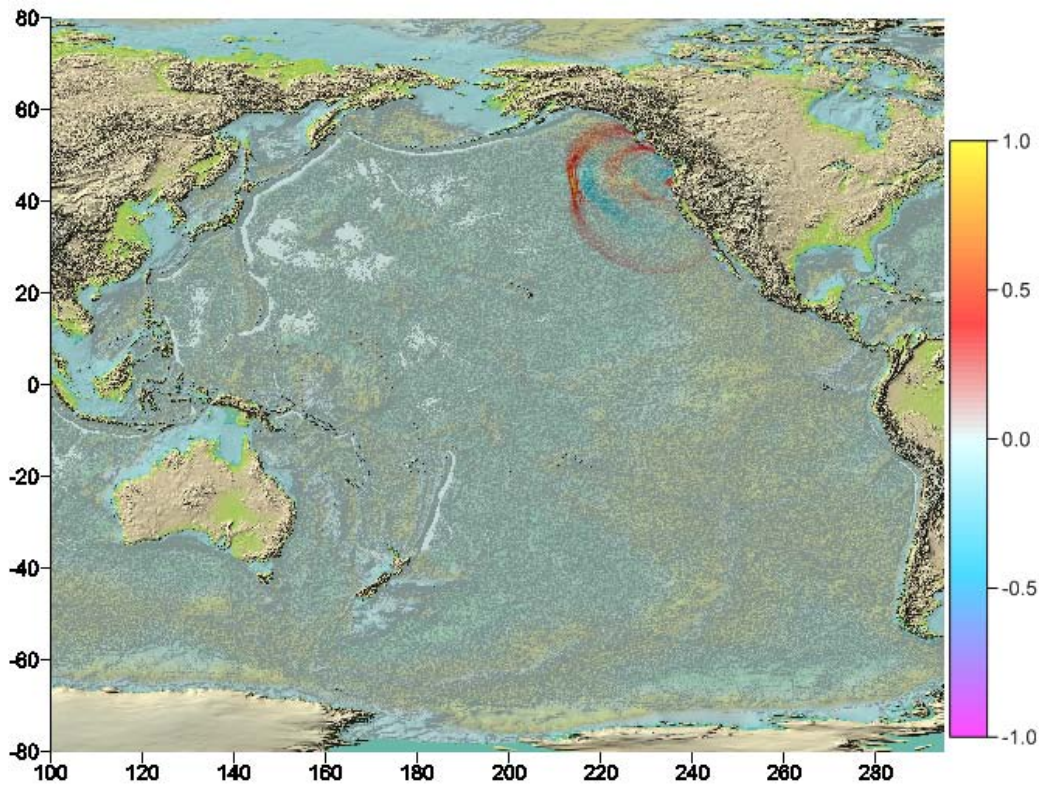


Figure D6. Snapshot of tsunami at time WCATWC bulletin 6 is issued.

WCATWC Message #6

WEPA41 PAAQ 232035
TSUWCA

BULLETIN

TSUNAMI MESSAGE NUMBER 6

NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK

135 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
CRESCENT CITY CA	41.7 N	124.2 W	1824UTC	15.75 FT/4.80 M
CHARLESTON OR	43.3 N	124.3 W	1833UTC	11.60 FT/3.55 M
HUMBOLDT BAY CA	40.7 N	124.2 W	1833UTC	2.95 FT/0.90 M

BAYOCEAN PEN OR	45.5 N	123.9 W	1835UTC	20.67 FT/6.30 M
CANNON BEACH OR	45.9 N	124.0 W	1840UTC	23.29 FT/7.10 M
GRENVILLE BAY WA	47.3 N	124.3 W	1842UTC	22.31 FT/6.80 M
NEWPORT OR	44.6 N	124.1 W	1842UTC	20.34 FT/6.20 M
WESTPORT WA	46.9 N	124.1 W	1849UTC	10.83 FT/3.30 M
NEAH BAY WA	48.4 N	124.6 W	1853UTC	5.58 FT/1.70 M
EUREKA CA	40.8 N	124.2 W	1902UTC	11.48 FT/3.50 M
TOFINO BC	49.1 N	125.8 W	1908UTC	5.25 FT/1.60 M
ASTORIA OR	46.2 N	123.8 W	1910UTC	3.67 FT/1.12 M
N VANCOUVER I	50.8 N	128.4 W	1913UTC	4.13 FT/1.26 M
PT REYES CA	38.1 N	122.9 W	1915UTC	2.10 FT/0.64 M
MONTEREY CA	36.6 N	121.9 W	1926UTC	0.92 FT/0.28 M
PORT ANGELES WA	48.1 N	123.4 W	1931UTC	2.46 FT/0.75 M
PORT SAN LUIS CA	35.2 N	120.8 W	1952UTC	0.92 FT/0.28 M
LANGARA BC	54.3 N	133.1 W	2007UTC	0.95 FT/0.29 M
SANTA BARBARA CA	34.4 N	119.7 W	2008UTC	0.29 FT/0.09 M
SAN PEDRO CA	33.7 N	118.3 W	2024UTC	0.56 FT/0.17 M
SANTA MONICA CA	34.0 N	118.5 W	2024UTC	0.43 FT/0.13 M
SEATTLE WA	47.6 N	122.3 W	2026UTC	0.49 FT/0.15 M

LAT - LATITUDE (N-NORTH, S-SOUTH)

LON - LONGITUDE (E-EAST, W-WEST)

TIME - TIME OF THE MEASUREMENT

AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.

IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.

VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

CRESCENT CITY CA ESTIMATES OVER \$6 MILLION IN PROPERTY DAMAGE.
 CHARLESTON OR ESTIMATES OVER \$3 MILLION IN DAMAGE. NEWPORT OR
 ESTIMATES OVER \$8 MILLION IN DAMAGE. WESTPORT WA ESTIMATES OVER
 \$4 MILLION IN DAMAGE. GRENVILLE BAY HAS INCREASED ITS DEATH
 TOLL TO 26 PEOPLE.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0

TIME - 1000 AKDT MAR 23 2011

1100 PDT MAR 23 2011

1800 UTC MAR 23 2011

LOCATION - 44.2 NORTH 125.0 WEST

95 MILES/153 KM W OF EUGENE OREGON

150 MILES/241 KM SW OF PORTLAND OREGON

DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD
 INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT
 WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL
 CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE
 INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/
 BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI
 WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT
 WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF
 THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT
 UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE
 WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-
 002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-
 250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-
 110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-
 181-185-187-191-232135-
 /T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z /
 COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO
 BORDER TO ATTU ALASKA
 135 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE WARNING ARE PROVIDED BELOW.

SAN FRANCISCO-CA	1245	PDT	MAR 23	KODIAK-AK	1417	AKDT	MAR 23
LANGARA-BC	1307	PDT	MAR 23	VALDEZ-AK	1432	AKDT	MAR 23
SANTA BARBARA-CA	1308	PDT	MAR 23	CORDOVA-AK	1441	AKDT	MAR 23
SAN PEDRO-CA	1324	PDT	MAR 23	SAND PT.-AK	1450	AKDT	MAR 23
LA JOLLA-CA	1338	PDT	MAR 23	DUTCH HARBOR-AK	1510	AKDT	MAR 23
SITKA-AK	1250	AKDT	MAR 23	HOMER-AK	1523	AKDT	MAR 23
ELFIN COVE-AK	1301	AKDT	MAR 23	COLD BAY-AK	1533	AKDT	MAR 23
CRAIG-AK	1318	AKDT	MAR 23	ADAK-AK	1535	AKDT	MAR 23
YAKUTAT-AK	1345	AKDT	MAR 23	SHEMYA-AK	1618	AKDT	MAR 23
SEWARD-AK	1416	AKDT	MAR 23				

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE WCATWC.ARH.NOAA.GOV

\$\$

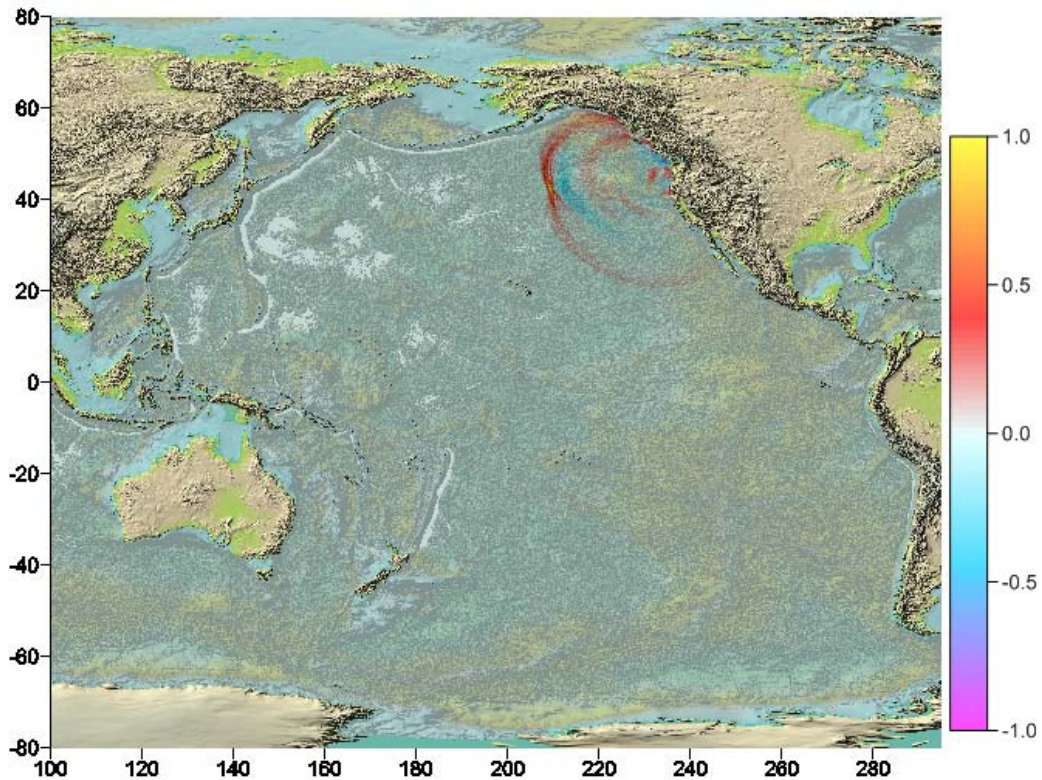


Figure D7. Snapshot of tsunami at time WCATWC bulletin 7 is issued.

WCATWC Message #7

WEPA41 PAAQ 232104

TSUWCA

BULLETIN

TSUNAMI MESSAGE NUMBER 7

NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
204 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
NEAH BAY WA	48.4 N	124.6 W	1853UTC	5.58 FT/1.70 M
EUREKA CA	40.8 N	124.2 W	1902UTC	11.48 FT/3.50 M
TOFINO BC	49.1 N	125.8 W	1908UTC	5.25 FT/1.60 M
N VANCOUVER I	50.8 N	128.4 W	1913UTC	4.13 FT/1.26 M
PT REYES CA	38.1 N	122.9 W	1915UTC	2.10 FT/0.64 M
MONTEREY CA	36.6 N	121.9 W	1926UTC	0.92 FT/0.28 M
PORT ANGELES WA	48.1 N	123.4 W	1931UTC	2.46 FT/0.75 M
LANGARA BC	54.3 N	133.1 W	2007UTC	0.95 FT/0.29 M
SANTA BARBARA CA	34.4 N	119.7 W	2008UTC	0.29 FT/0.09 M
SAN PEDRO CA	33.7 N	118.3 W	2024UTC	0.56 FT/0.17 M
SANTA MONICA CA	34.0 N	118.5 W	2024UTC	0.43 FT/0.13 M
SEATTLE WA	47.6 N	122.3 W	2026UTC	0.49 FT/0.15 M
LA JOLLA CA	32.8 N	117.3 W	2038UTC	0.56 FT/0.17 M
SITKA AK	57.1 N	135.3 W	2050UTC	0.36 FT/0.11 M
PORT SAN LUIS CA	35.2 N	120.8 W	2059UTC	1.80 FT/0.55 M
ASTORIA OR	46.2 N	123.8 W	2059UTC	3.97 FT/1.21 M

LAT - LATITUDE (N-NORTH, S-SOUTH)

LON - LONGITUDE (E-EAST, W-WEST)

TIME - TIME OF THE MEASUREMENT

AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.

IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.

VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

PORT SAN LUIS CA HAS REPORTED A SECOND TSUNAMI MEASURING 1.80 FT/0.55 METERS IN HEIGHT AND ASTORIA OR REPORTS A SECOND TSUNAMI MEASURING 3.97 FT/1.21M IN HEIGHT. ASTORIA OR REPORTS THAT MANY BOATS HAVE BEEN DAMAGED AND CURRENT DAMAGE ESTIMATES RANGE FROM \$4.3 MILLION AND \$6.5 MILLION. TWO PEOPLE UNDER THE ASTORIAS HWY 101 BRIDGE WERE FOUND DROWN. TOKELAND WA REPORTS THAT 33 PEOPLE HAVE BEEN KILLED AND OTHERS ARE AWAITING ASSISTANCE.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0

TIME - 1000 AKDT MAR 23 2011

1100 PDT MAR 23 2011

1800 UTC MAR 23 2011

LOCATION - 44.2 NORTH 125.0 WEST

95 MILES/153 KM W OF EUGENE OREGON

150 MILES/241 KM SW OF PORTLAND OREGON

DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-181-185-187-191-232204-
/T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA
204 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE WARNING ARE PROVIDED BELOW.

LANGARA-BC	1307	PDT MAR 23	KODIAK-AK	1417	AKDT MAR 23
SANTA BARBARA-CA	1308	PDT MAR 23	VALDEZ-AK	1432	AKDT MAR 23
SAN PEDRO-CA	1324	PDT MAR 23	CORDOVA-AK	1441	AKDT MAR 23
LA JOLLA-CA	1338	PDT MAR 23	SAND PT.-AK	1450	AKDT MAR 23
SITKA-AK	1250	AKDT MAR 23	DUTCH HARBOR-AK	1510	AKDT MAR 23
ELFIN COVE-AK	1301	AKDT MAR 23	HOMER-AK	1523	AKDT MAR 23
CRAIG-AK	1318	AKDT MAR 23	COLD BAY-AK	1533	AKDT MAR 23
YAKUTAT-AK	1345	AKDT MAR 23	ADAK-AK	1535	AKDT MAR 23
SEWARD-AK	1416	AKDT MAR 23	SHEMYA-AK	1618	AKDT MAR 23

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE WCATWC.ARH.NOAA.GOV

\$\$

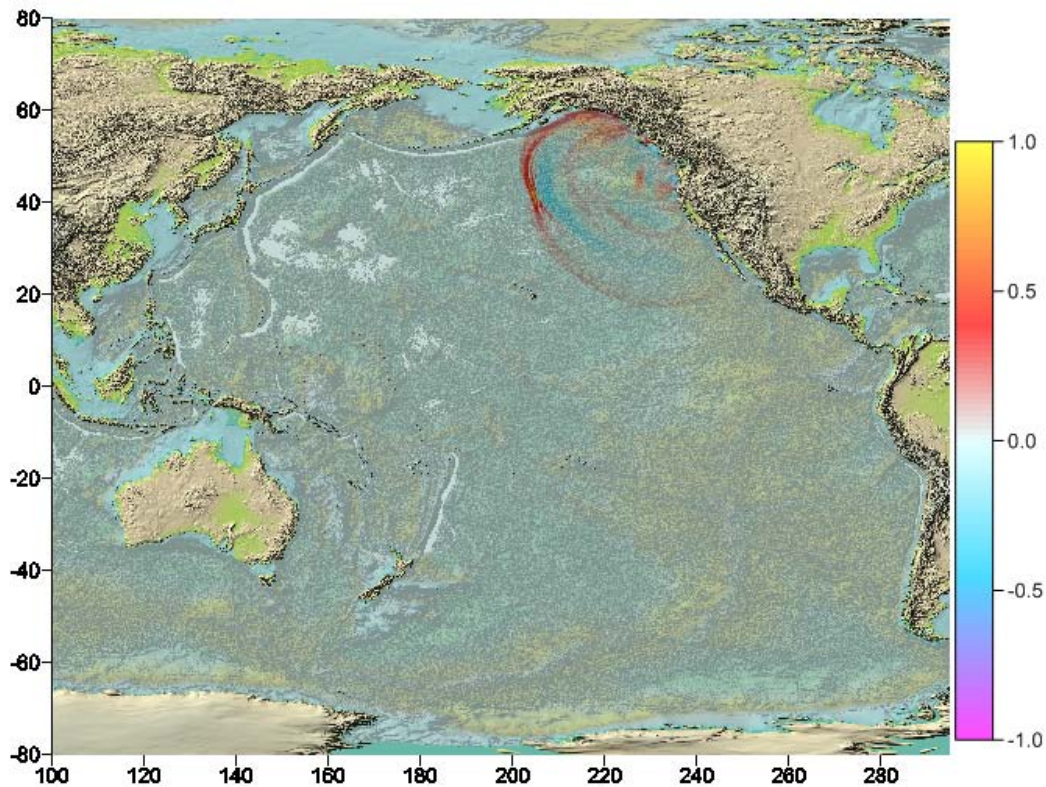


Figure D8. Snapshot of tsunami at time WCATWC bulletin 8 is issued.

WCATWC Message #8

WEPA41 PAAQ 232133
TSUWCA

BULLETIN
TSUNAMI MESSAGE NUMBER 8
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
233 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
MONTEREY CA	36.6 N	121.9 W	1926UTC	0.92 FT/0.28 M
PORT ANGELES WA	48.1 N	123.4 W	1931UTC	2.46 FT/0.75 M
SANTA BARBARA CA	34.4 N	119.7 W	2008UTC	0.29 FT/0.09 M
SAN PEDRO CA	33.7 N	118.3 W	2024UTC	0.56 FT/0.17 M

SANTA MONICA CA	34.0 N	118.5 W	2024UTC	0.43 FT/0.13 M
SEATTLE WA	47.6 N	122.3 W	2026UTC	0.49 FT/0.15 M
LA JOLLA CA	32.8 N	117.3 W	2038UTC	0.56 FT/0.17 M
SITKA AK	57.1 N	135.3 W	2050UTC	0.36 FT/0.11 M
PORT SAN LUIS CA	35.2 N	120.8 W	2059UTC	1.80 FT/0.55 M
ASTORIA OR	46.2 N	123.8 W	2059UTC	3.97 FT/1.21 M
ELFIN COVE AK	58.2 N	136.3 W	2101UTC	1.90 FT/0.58 M
LANGARA BC	54.3 N	133.1 W	2123UTC	1.18 FT/0.36 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

ELFIN COVE AK HAS REPORTED A 1.90 FOOT/0.58 METER WAVE. THERE WAS NO DAMAGE TO THE BOATS OR DOCKS BECAUSE OF ITS FLOATING DOCK SYSTEM THAT COMPENSATES FOR THE TIDAL RANGE. TWO PEOPLE DID FALL WITH THE SUDDEN SURGE AND WERE TAKEN TO THE LOCAL HEALTH CLINIC. TO THIS POINT TSUNAMIS IN SOUTHERN CA HAVE BEEN REPORTED TO BE NOT IN EXCESS OF 1.8 FEET/0.5 METERS.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0
 TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
 LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
 DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-181-185-187-191-232233-
 /T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z/
 COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA
 233 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF

WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE WARNING ARE PROVIDED BELOW.

LA JOLLA-CA	1338	PDT	MAR 23	CORDOVA-AK	1441	AKDT	MAR 23
SITKA-AK	1250	AKDT	MAR 23	SAND PT.-AK	1450	AKDT	MAR 23
ELFIN COVE-AK	1301	AKDT	MAR 23	DUTCH HARBOR-AK	1510	AKDT	MAR 23
CRAIG-AK	1318	AKDT	MAR 23	HOMER-AK	1523	AKDT	MAR 23
YAKUTAT-AK	1345	AKDT	MAR 23	COLD BAY-AK	1533	AKDT	MAR 23
SEWARD-AK	1416	AKDT	MAR 23	ADAK-AK	1535	AKDT	MAR 23
KODIAK-AK	1417	AKDT	MAR 23	SHEMYA-AK	1618	AKDT	MAR 23
VALDEZ-AK	1432	AKDT	MAR 23				

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

\$\$

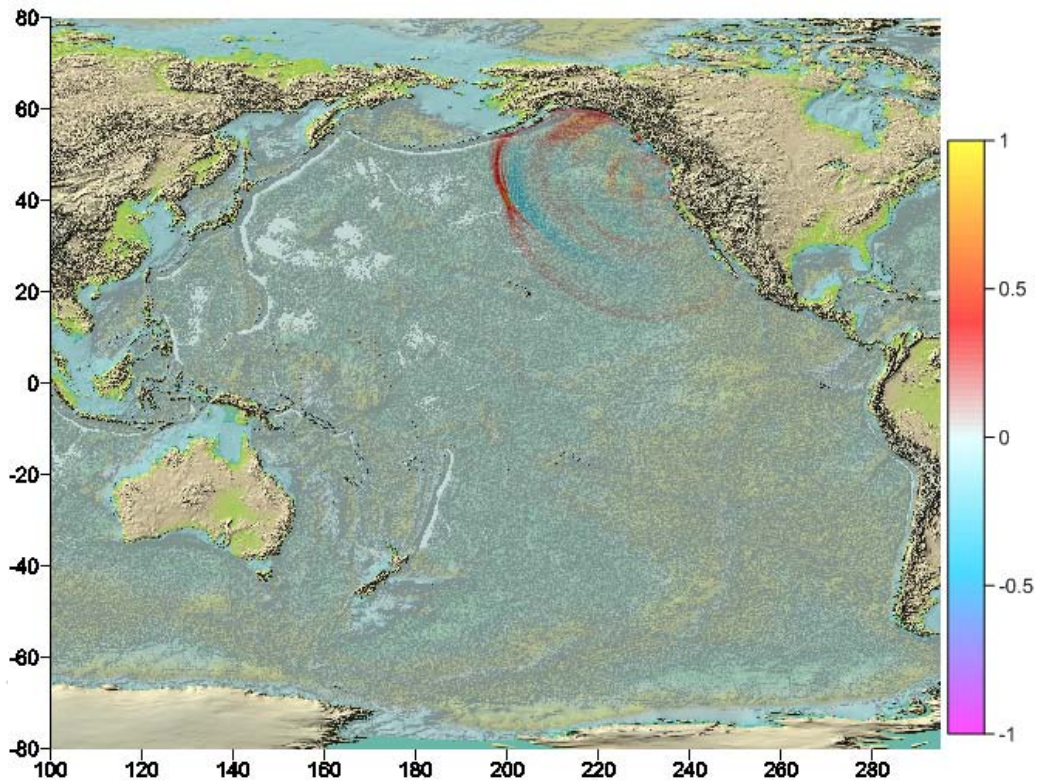


Figure D9. Snapshot of tsunami at time WCATWC bulletin 9 is issued.

WCATWC Message #9

WEPA41 PAAQ 232203
TSUWCA

BULLETIN
TSUNAMI MESSAGE NUMBER 9
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
303 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
SANTA BARBARA CA	34.4 N	119.7 W	2008UTC	0.29 FT/0.09 M
SAN PEDRO CA	33.7 N	118.3 W	2024UTC	0.56 FT/0.17 M
SANTA MONICA CA	34.0 N	118.5 W	2024UTC	0.43 FT/0.13 M
SEATTLE WA	47.6 N	122.3 W	2026UTC	0.49 FT/0.15 M
LA JOLLA CA	32.8 N	117.3 W	2038UTC	0.56 FT/0.17 M
SITKA AK	57.1 N	135.3 W	2050UTC	0.36 FT/0.11 M
PORT SAN LUIS CA	35.2 N	120.8 W	2059UTC	1.80 FT/0.55 M
ASTORIA OR	46.2 N	123.8 W	2059UTC	3.97 FT/1.21 M
ELFIN COVE AK	58.2 N	136.3 W	2101UTC	1.90 FT/0.58 M
LANGARA BC	54.3 N	133.1 W	2123UTC	1.18 FT/0.36 M
YAKUTAT AK	59.5 N	139.7 W	2145UTC	2.00 FT/0.61 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

A 2.0 FT/0.6 METER TSUNAMI IN YAKUTAT AK ENTERED THROUGH MONTI BAY AND FLOODED THE KITTORAL REGIONS UP TO MAX ITALIO DRIVE. THREE PEOPLE STANDING ON THE SHORE ON YAKUTAT DRIVE WERE HURT - TWO DROWN AND ONE WAS TAKEN TO THE LOCAL HEALTH CLINIC WITH A BROKEN HIP.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0
 TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
 LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
 DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-

181-185-187-191-232303-
 /T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z/
 COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO
 BORDER TO ATTU ALASKA
 303 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL
 AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH
 COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO
 ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO
 HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD
 INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF
 WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
 TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED
 SITES IN THE WARNING ARE PROVIDED BELOW.

CRAIG-AK	1318 AKDT MAR 23	SAND PT.-AK	1450 AKDT MAR 23
YAKUTAT-AK	1345 AKDT MAR 23	DUTCH HARBOR-AK	1510 AKDT MAR 23
SEWARD-AK	1416 AKDT MAR 23	HOMER-AK	1523 AKDT MAR 23
KODIAK-AK	1417 AKDT MAR 23	COLD BAY-AK	1533 AKDT MAR 23
VALDEZ-AK	1432 AKDT MAR 23	ADAK-AK	1535 AKDT MAR 23
CORDOVA-AK	1441 AKDT MAR 23	SHEMYA-AK	1618 AKDT MAR 23

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
 WCATWC.ARH.NOAA.GOV

\$\$

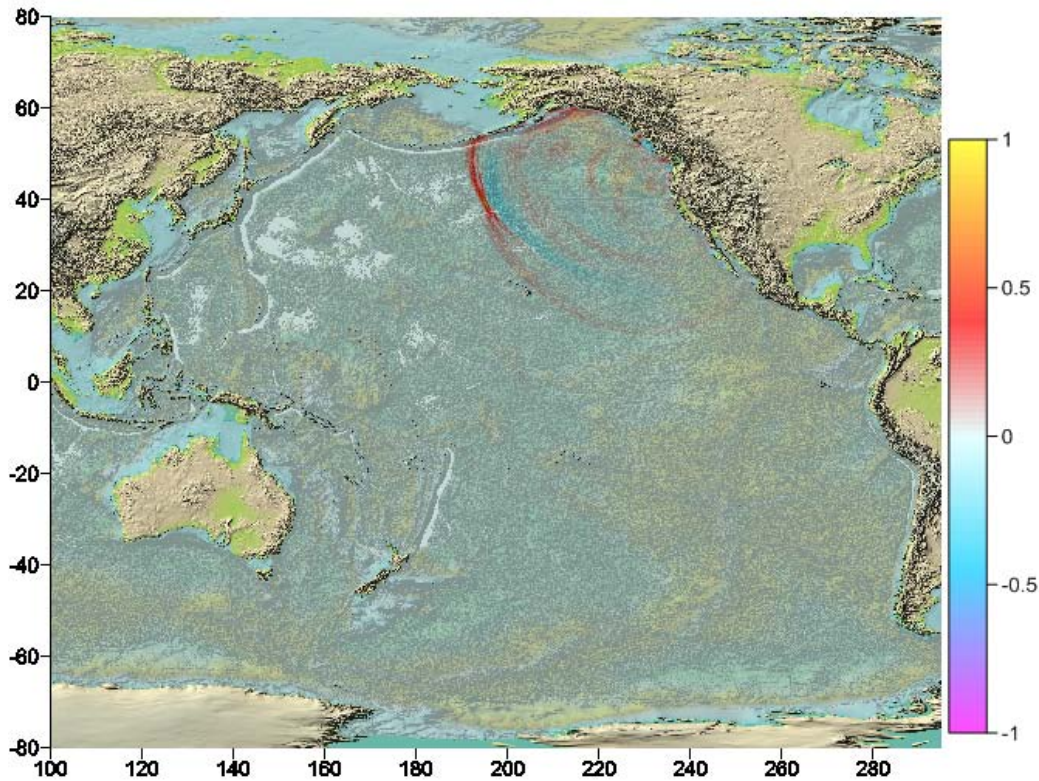


Figure D10. Snapshot of tsunami at time WCATWC bulletin 10 is issued.

WCATWC Message #10

WEPA41 PAAQ 232236

TSUWCA

BULLETIN

TSUNAMI MESSAGE NUMBER 10

NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK

336 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
LA JOLLA CA	32.8 N	117.3 W	2038UTC	0.56 FT/0.17 M
PORT SAN LUIS CA	35.2 N	120.8 W	2059UTC	1.80 FT/0.55 M
ELFIN COVE AK	58.2 N	136.3 W	2101UTC	1.90 FT/0.58 M
LANGARA BC	54.3 N	133.1 W	2123UTC	1.18 FT/0.36 M
YAKUTAT AK	59.5 N	139.7 W	2145UTC	2.00 FT/0.61 M
SITKA AK	57.1 N	135.3 W	2200UTC	0.36 FT/0.11 M
TOFINO BC	49.1 N	125.8 W	2210UTC	8.53 FT/2.60 M
SEWARD AK	60.1 N	149.4 W	2216UTC	1.97 FT/0.60 M
KODIAK AK	57.8 N	152.4 W	2217UTC	0.98 FT/0.30 M

LAT - LATITUDE (N-NORTH, S-SOUTH)

LON - LONGITUDE (E-EAST, W-WEST)

TIME - TIME OF THE MEASUREMENT

AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.

IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.

VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

TOFINO BC REPORTED A SECOND TSUNAMI WITH A WAVE OF 8.5 FT/2.6 METERS. THIS LATEST WAVE FLOODED TOFINO STREETS FROM THE COAST INLAND TO NEILL STREET. CANADIAN HWY 4 CONTINUES TO BE SUBMERGED AND CURRENTLY CLOSED BETWEEN LONG BEACH AND TOFINO.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0

TIME - 1000 AKDT MAR 23 2011

1100 PDT MAR 23 2011

1800 UTC MAR 23 2011

LOCATION - 44.2 NORTH 125.0 WEST

95 MILES/153 KM W OF EUGENE OREGON

150 MILES/241 KM SW OF PORTLAND OREGON

DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI

WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT
WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF
THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT
UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE
WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-
002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-
250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-
110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-
181-185-187-191-232336-
/T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO
BORDER TO ATTU ALASKA
336 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL
AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH
COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO
ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO
HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD
INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF
WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED
SITES IN THE WARNING ARE PROVIDED BELOW.

YAKUTAT-AK	1345 AKDT MAR 23	DUTCH HARBOR-AK	1510 AKDT MAR 23
SEWARD-AK	1416 AKDT MAR 23	HOMER-AK	1523 AKDT MAR 23
KODIAK-AK	1417 AKDT MAR 23	COLD BAY-AK	1533 AKDT MAR 23
VALDEZ-AK	1432 AKDT MAR 23	ADAK-AK	1535 AKDT MAR 23
CORDOVA-AK	1441 AKDT MAR 23	SHEMYA-AK	1618 AKDT MAR 23
SAND PT.-AK	1450 AKDT MAR 23		

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

\$\$

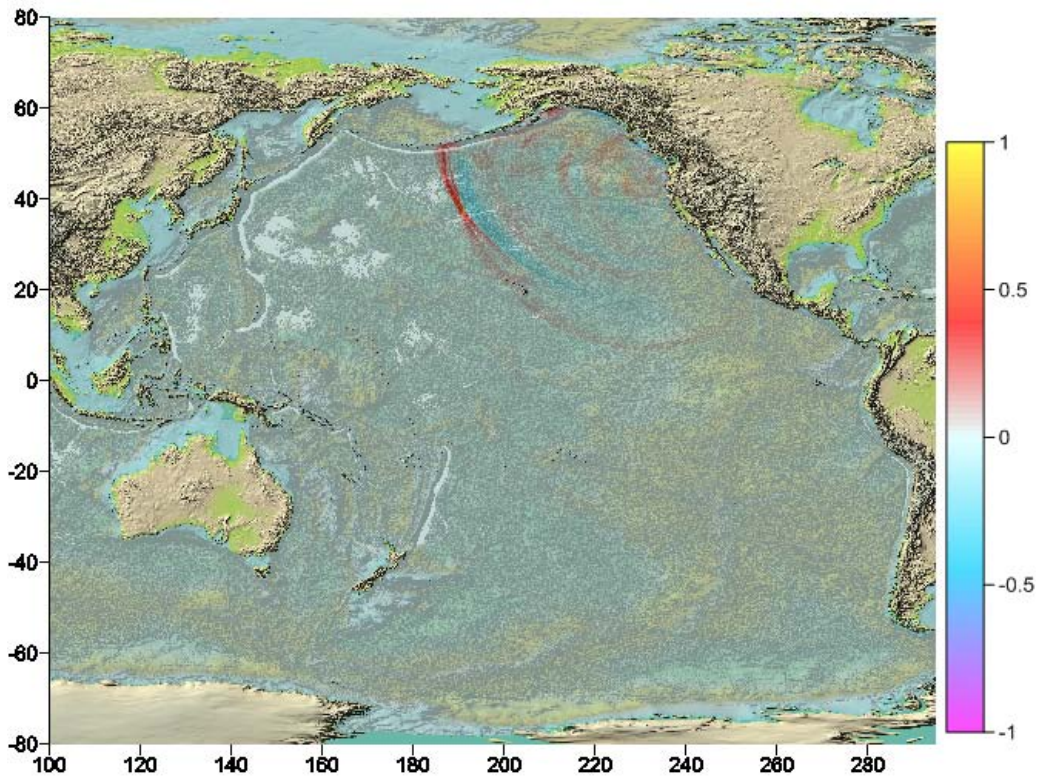


Figure D11. Snapshot of tsunami at time WCATWC bulletin 11 is issued.

WCATWC Message #11

WEPA41 PAAQ 232303
TSUWCA

BULLETIN
TSUNAMI MESSAGE NUMBER 11
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
403 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
ELFIN COVE AK	58.2 N	136.3 W	2101UTC	1.90 FT/0.58 M
LANGARA BC	54.3 N	133.1 W	2123UTC	1.18 FT/0.36 M
YAKUTAT AK	59.5 N	139.7 W	2145UTC	2.00 FT/0.61 M

SITKA AK	57.1 N	135.3 W	2200UTC	0.36 FT/0.11 M
TOFINO BC	49.1 N	125.8 W	2210UTC	8.53 FT/2.60 M
SEWARD AK	60.1 N	149.4 W	2216UTC	1.97 FT/0.60 M
KODIAK AK	57.8 N	152.4 W	2217UTC	0.98 FT/0.30 M
AKUTAN AK	54.1 N	165.8 W	2256UTC	0.52 FT/0.16 M
KING COVE AK	55.1 N	162.3 W	2258UTC	3.05 FT/0.93 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

SEWARD AK IS REPORTING THE DEATH OF ONE ADULT WHEN A 2.0 FOOT/0.6 METER WAVE KNOCKED THEM AGAINST THE ROCKS LOCATED SEAWARD OF RAILWAY AVE NEAR THE ALASKA SEALIFE CENTER.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0
 TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
 LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
 DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-181-185-187-191-240003-
 /T.CON.PAAQ.TS.W.0295.000000T0000Z-000000T0000Z/
 COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA
 403 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE WARNING ARE PROVIDED BELOW.

SEWARD-AK	1416	AKDT	MAR 23	DUTCH HARBOR-AK	1510	AKDT	MAR 23
KODIAK-AK	1417	AKDT	MAR 23	HOMER-AK	1523	AKDT	MAR 23
VALDEZ-AK	1432	AKDT	MAR 23	COLD BAY-AK	1533	AKDT	MAR 23
CORDOVA-AK	1441	AKDT	MAR 23	ADAK-AK	1535	AKDT	MAR 23
SAND PT.-AK	1450	AKDT	MAR 23	SHEMYA-AK	1618	AKDT	MAR 23

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
 WCATWC.ARH.NOAA.GOV

\$\$

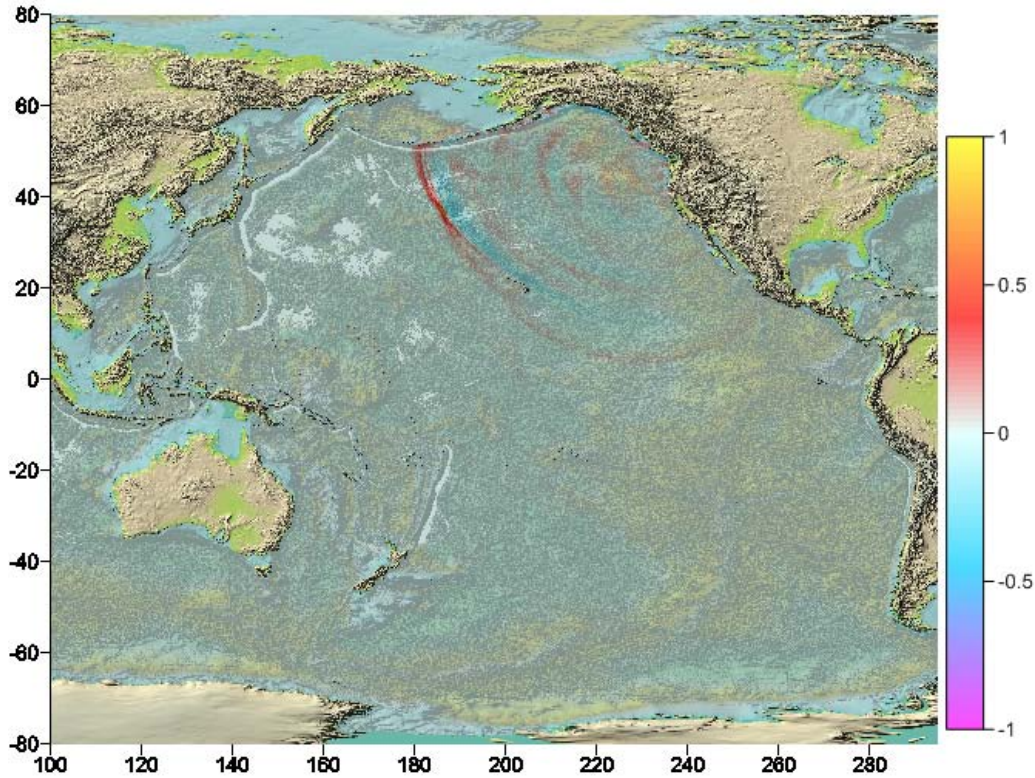


Figure D12. Snapshot of tsunami at time WCATWC bulletin 12 is issued.

WCATWC Message #12

WEPA41 PAAQ 232334
 TSUWCA

BULLETIN
 TSUNAMI MESSAGE NUMBER 12
 NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
 434 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL
 AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH
 COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO
 ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE
 WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING
 COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL
 EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY
 RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
YAKUTAT AK	59.5 N	139.7 W	2145UTC	2.00 FT/0.61 M
SITKA AK	57.1 N	135.3 W	2200UTC	0.36 FT/0.11 M
TOFINO BC	49.1 N	125.8 W	2210UTC	8.53 FT/2.60 M
SEWARD AK	60.1 N	149.4 W	2216UTC	1.97 FT/0.60 M
AKUTAN AK	54.1 N	165.8 W	2256UTC	0.52 FT/0.16 M
KING COVE AK	55.1 N	162.3 W	2258UTC	3.05 FT/0.93 M
NIKOLSKI AK	52.9 N	168.9 W	2304UTC	1.38 FT/0.42 M
PORT ANGELES WA	48.1 N	123.4 W	2305UTC	3.61 FT/1.10 M
VALDEZ AK	61.1 N	146.3 W	2315UTC	1.18 FT/0.36 M
KODIAK AK	57.8 N	152.4 W	2325UTC	2.00 FT/0.61 M
ASTORIA OR	46.2 N	123.8 W	2328UTC	4.53 FT/1.38 M

LAT - LATITUDE (N-NORTH, S-SOUTH)

LON - LONGITUDE (E-EAST, W-WEST)

TIME - TIME OF THE MEASUREMENT

AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.

IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.

VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

KING COVE AK REPORTS THAT TWO FISHERMEN DIED WHEN THEIR CRAFT WAS FLOODED BY A 3.0 FOOT/0.9 METER WAVE AND FORCED THEM AGAINST SOME ROCKS NEAR RAMS CREEK ROAD. FRONTAGE ROADS SEAWARD OF RAMS CREEK ROAD HAVE BEEN CLOSED DUE TO FLOODING.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0

TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011

LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON

DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-181-185-187-191-240034-
 /T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z/
 COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA
 434 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE WARNING ARE PROVIDED BELOW.

CORDOVA-AK	1441 AKDT MAR 23	COLD BAY-AK	1533 AKDT MAR 23
SAND PT.-AK	1450 AKDT MAR 23	ADAK-AK	1535 AKDT MAR 23
DUTCH HARBOR-AK	1510 AKDT MAR 23	SHEMYA-AK	1618 AKDT MAR 23
HOMER-AK	1523 AKDT MAR 23		

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE WCATWC.ARH.NOAA.GOV

\$\$

WCATWC Message #13

WEPA41 PAAQ 240004
TSUWCA

BULLETIN

TSUNAMI MESSAGE NUMBER 13
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
504 PM PDT WED MAR 23 2011

NEW OBSERVATIONS INCLUDED BELOW.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
-----	-----	-----	-----	-----
SITKA AK	57.1 N	135.3 W	2200UTC	0.36 FT/0.11 M
TOFINO BC	49.1 N	125.8 W	2210UTC	8.53 FT/2.60 M
SEWARD AK	60.1 N	149.4 W	2216UTC	1.97 FT/0.60 M
AKUTAN AK	54.1 N	165.8 W	2256UTC	0.52 FT/0.16 M
KING COVE AK	55.1 N	162.3 W	2258UTC	3.05 FT/0.93 M
NIKOLSKI AK	52.9 N	168.9 W	2304UTC	1.38 FT/0.42 M
PORT ANGELES WA	48.1 N	123.4 W	2305UTC	3.61 FT/1.10 M
VALDEZ AK	61.1 N	146.3 W	2315UTC	1.18 FT/0.36 M
KODIAK AK	57.8 N	152.4 W	2325UTC	2.00 FT/0.61 M
ASTORIA OR	46.2 N	123.8 W	2328UTC	4.53 FT/1.38 M
PORT SAN LUIS CA	35.2 N	120.8 W	2345UTC	1.94 FT/0.59 M
MONTEREY CA	36.6 N	121.9 W	0000UTC	1.15 FT/0.35 M
SANTA BARBARA CA	34.4 N	119.7 W	0000UTC	0.59 FT/0.18 M

DUTCH HARBOR AK 53.9 N 166.5 W 0002UTC 1.21 FT/0.37 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

ASTORIA OR REPORTS ANOTHER SIGNIFICANT TSUNAMI. THIS ONE IS RECORDED AT 4.53 FT/1.38 METERS IN HEIGHT. THERE ARE REPORTS OF REDUCED TSUNAMI HEIGHTS ALONG THE WASHINGTON - OREGON AND NORTHERN CALIFORNIA COASTS THOUGH THE TSUNAMI STILL CONTAINS DANGEROUS CURRENTS AND IS UNPREDICTABLE.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0
 TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
 LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
 DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-181-185-187-191-240104-
 /T.CON.PAAQ.TS.W.0294.000000T0000Z-000000T0000Z/
 COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA
 504 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE WARNING ARE PROVIDED BELOW.

DUTCH HARBOR-AK	1510 AKDT MAR 23	ADAK-AK	1535 AKDT MAR 23
HOMER-AK	1523 AKDT MAR 23	SHEMYA-AK	1618 AKDT MAR 23
COLD BAY-AK	1533 AKDT MAR 23		

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

\$\$

WCATWC Message #14

WEPA41 PAAQ 240037
TSUWCA

BULLETIN

TSUNAMI MESSAGE NUMBER 14
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
537 PM PDT WED MAR 23 2011

THIS MESSAGE REDUCES SOME AREAS OF THE WARNING REGION TO AN
ADVISORY AND CANCELS THE WARNING IN CERTAIN REGIONS.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL
AREAS OF CALIFORNIA - OREGON - WASHINGTON AND BRITISH
COLUMBIA FROM HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF
EUREKA/ TO THE ALASKA-BRITISH COLUMBIA BORDER...

...A TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF ALASKA FROM THE ALASKA-BRITISH COLUMBIA
BORDER TO ATTU ALASKA...

...THE TSUNAMI WARNING IS CANCELED FOR THE COASTAL AREAS OF
CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO HORSE
MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO CAUSE DAMAGE
TO THE WARNING AND/OR ADVISORY REGIONS LISTED IN THE HEADLINE.
PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO
INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS
ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO
HIGHER GROUND.
- PERSONS IN TSUNAMI ADVISORY AREAS SHOULD MOVE OUT OF THE
WATER... OFF THE BEACH AND OUT OF HARBORS AND MARINAS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
AKUTAN AK	54.1 N	165.8 W	2256UTC	0.52 FT/0.16 M
KING COVE AK	55.1 N	162.3 W	2258UTC	3.05 FT/0.93 M
NIKOLSKI AK	52.9 N	168.9 W	2304UTC	1.38 FT/0.42 M
PORT ANGELES WA	48.1 N	123.4 W	2305UTC	3.61 FT/1.10 M
KODIAK AK	57.8 N	152.4 W	2325UTC	2.00 FT/0.61 M
ASTORIA OR	46.2 N	123.8 W	2328UTC	4.53 FT/1.38 M
PORT SAN LUIS CA	35.2 N	120.8 W	2345UTC	1.94 FT/0.59 M
MONTEREY CA	36.6 N	121.9 W	0000UTC	1.15 FT/0.35 M
SANTA BARBARA CA	34.4 N	119.7 W	0000UTC	0.59 FT/0.18 M
DUTCH HARBOR AK	53.9 N	166.5 W	0002UTC	1.21 FT/0.37 M
SANTA MONICA CA	34.0 N	118.5 W	0004UTC	0.69 FT/0.21 M
VALDEZ AK	61.1 N	146.3 W	0010UTC	1.54 FT/0.47 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

DUTCH HARBOR AK REPORTS THAT A 1.0 FOOT/0.3 METER WAVE WAS RECORDED IN CAPTAINS BAY. NO DAMAGE OR INJURIES WERE REPORTED.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0
 TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
 LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
 DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

TSUNAMI ADVISORIES MEAN THAT A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED. SIGNIFICANT WIDESPREAD INUNDATION IS NOT EXPECTED FOR AREAS UNDER AN ADVISORY. CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL STRUCTURES AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

PZZ530-CAZ042-043-040-041-087-039-034-035-529-530-006-505>509-002-240137-
 /T.CAN.PAAQ.TS.W.0294.000000T0000Z-000000T0000Z/
 COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO BORDER TO HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/
 537 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING IS CANCELED FOR THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/...

\$\$

CAZ001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-240137-
 /T.CON.PAAQ.TS.W.0294.000000T0000Z-000000T0000Z/
 COASTAL AREAS BETWEEN AND INCLUDING HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/ TO THE ALASKA-BRITISH COLUMBIA BORDER
 537 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON AND BRITISH COLUMBIA FROM HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/ TO THE ALASKA-BRITISH COLUMBIA BORDER...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD

INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME.

\$\$

AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-181-185-187-191-240137-
/T.CAN.PAAQ.TS.W.0294.000000T0000Z-000000T0000Z/
/T.NEW.PAAQ.TS.Y.0294.110324T0037Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING THE ALASKA-BRITISH COLUMBIA BORDER TO ATTU ALASKA
537 PM PDT WED MAR 23 2011

...A TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE COASTAL AREAS OF ALASKA FROM THE ALASKA-BRITISH COLUMBIA BORDER TO ATTU ALASKA...

PERSONS IN TSUNAMI ADVISORY AREAS SHOULD MOVE OUT OF THE WATER... OFF THE BEACH AND OUT OF HARBORS AND MARINAS.

TSUNAMI ADVISORIES MEAN THAT A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR WATER IS IMMINENT OR EXPECTED. SIGNIFICANT WIDESPREAD INUNDATION IS NOT EXPECTED FOR AREAS IN AN ADVISORY. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED SITES IN THE ADVISORY ARE PROVIDED BELOW.

SHEMYA-AK 1618 AKDT MAR 23

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE WCATWC.ARH.NOAA.GOV

\$\$

WCATWC Message #15

WEPA41 PAAQ 240101
TSUWCA

BULLETIN
TSUNAMI MESSAGE NUMBER 15
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
601 PM PDT WED MAR 23 2011

THIS MESSAGES CANCELS THE TSUNAMI ADVISORY. THE TSUNAMI WARNING IS STILL IN EFFECT.

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON AND BRITISH COLUMBIA FROM HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/ TO THE ALASKA-BRITISH COLUMBIA BORDER...

...THIS MESSAGE IS INFORMATION ONLY FOR COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/...

...THE TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS OF ALASKA FROM THE ALASKA-BRITISH COLUMBIA BORDER TO ATTU ALASKA...

RECOMMENDED ACTIONS

A TSUNAMI HAS BEEN GENERATED WHICH IS EXPECTED TO DAMAGE THE WARNING REGIONS LISTED IN THE HEADLINE. PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS ARE ONLY ORDERED BY EMERGENCY

RESPONSE AGENCIES.

- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO HIGHER GROUND.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
NIKOLSKI AK	52.9 N	168.9 W	2304UTC	1.38 FT/0.42 M
PORT ANGELES WA	48.1 N	123.4 W	2305UTC	3.61 FT/1.10 M
KODIAK AK	57.8 N	152.4 W	2325UTC	2.00 FT/0.61 M
ASTORIA OR	46.2 N	123.8 W	2328UTC	4.53 FT/1.38 M
PORT SAN LUIS CA	35.2 N	120.8 W	2345UTC	1.94 FT/0.59 M
MONTEREY CA	36.6 N	121.9 W	0000UTC	1.15 FT/0.35 M
SANTA BARBARA CA	34.4 N	119.7 W	0000UTC	0.59 FT/0.18 M
DUTCH HARBOR AK	53.9 N	166.5 W	0002UTC	1.21 FT/0.37 M
SANTA MONICA CA	34.0 N	118.5 W	0004UTC	0.69 FT/0.21 M
VALDEZ AK	61.1 N	146.3 W	0010UTC	1.54 FT/0.47 M

LAT - LATITUDE (N-NORTH, S-SOUTH)

LON - LONGITUDE (E-EAST, W-WEST)

TIME - TIME OF THE MEASUREMENT

AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.

IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.

VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

VALDEZ AK REPORTS A 1.5 FOOT/0.4 METER ENTERING PORT VALDEZ. NO INJURIES OR DAMAGES WERE REPORTED.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0

TIME - 1000 AKDT MAR 23 2011

1100 PDT MAR 23 2011

1800 UTC MAR 23 2011

LOCATION - 44.2 NORTH 125.0 WEST

95 MILES/153 KM W OF EUGENE OREGON

150 MILES/241 KM SW OF PORTLAND OREGON

DEPTH - 25 MILES/40 KM

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. WARNINGS INDICATE THAT WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

AKZ026>029-023-024-019>022-025-017-131-135-125-121-171-181-185-187-191-240201-

/T.CAN.PAAQ.TS.Y.0290.000000T0000Z-000000T0000Z/

COASTAL AREAS BETWEEN AND INCLUDING THE ALASKA-BRITISH COLUMBIA BORDER TO ATTU ALASKA

601 PM PDT WED MAR 23 2011

...THE TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS OF ALASKA FROM THE ALASKA-BRITISH COLUMBIA BORDER TO ATTU ALASKA...

\$\$

CAZ001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-
 250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-
 110-240201-
 /T.CON.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z/
 COASTAL AREAS BETWEEN AND INCLUDING HORSE MOUNTAIN
 CALIFORNIA/50 MILES SW OF EUREKA/ TO THE ALASKA-BRITISH
 COLUMBIA BORDER
 601 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING CONTINUES IN EFFECT FOR THE COASTAL
 AREAS OF CALIFORNIA - OREGON - WASHINGTON AND BRITISH
 COLUMBIA FROM HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF
 EUREKA/ TO THE ALASKA-BRITISH COLUMBIA BORDER...

PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO
 HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD
 INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF
 WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
 TIME.

\$\$

WCATWC Message #16

WEPA41 PAAQ 240136
 TSUWCA

BULLETIN

TSUNAMI MESSAGE NUMBER 16
 NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
 636 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING IS CANCELED FOR THE COASTAL AREAS OF
 CALIFORNIA - OREGON - WASHINGTON AND BRITISH COLUMBIA FROM
 HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/ TO THE
 ALASKA-BRITISH COLUMBIA BORDER...

EVALUATION

DAMAGING TSUNAMIS ARE NO LONGER EXPECTED ALONG THE COASTS OF
 THE U.S. WEST COAST STATES - ALASKA AND BRITISH COLUMBIA. AS
 LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI WAVE
 ACTION THE ALL CLEAR DETERMINATIONS MUST BE MADE BY LOCAL
 AUTHORITIES.

TSUNAMI AMPLITUDES HAVE DROPPED BELOW DANGEROUS LEVELS AT MOST
 LOCATIONS ALONG THE U.S. WEST COAST - CANADA AND ALASKA. SEA
 LEVEL CONDITIONS STILL VARY GREATLY FROM LOCATION TO LOCATION
 ALONG THE COAST. DECISIONS RELATING TO REOCCUPATION OF COASTAL
 ZONES MUST BE MADE BY LOCAL AUTHORITIES.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
PORT SAN LUIS CA	35.2 N	120.8 W	2345UTC	1.94 FT/0.59 M
MONTEREY CA	36.6 N	121.9 W	0000UTC	1.15 FT/0.35 M
SANTA BARBARA CA	34.4 N	119.7 W	0000UTC	0.59 FT/0.18 M
DUTCH HARBOR AK	53.9 N	166.5 W	0002UTC	1.21 FT/0.37 M
SANTA MONICA CA	34.0 N	118.5 W	0004UTC	0.69 FT/0.21 M
VALDEZ AK	61.1 N	146.3 W	0010UTC	1.54 FT/0.47 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.

VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

A SUMMARY OF DAMAGES AND DEATHS REPORTED THUS FAR BY EACH STATE IS AS FOLLOWS: CALIFORNIA \$53 MILLION 143 DEATHS - OREGON \$28 MILLION 87 DEATHS - WASHINGTON \$43 MILLION 101 DEATHS - BRITISH COLUMBIA \$11 MILLION 24 DEATHS - ALASKA \$23 MILLION 19 DEATHS. THE COAST GUARD REPORTS RESCUING 28 PEOPLE THUS FAR ALONG THE WEST COAST THAT WERE DRAGGED BY THE TSUNAMI UP TO A MILE OUT TO SEA. ALL WAVES ALONG THE US AND CANADA WEST COAST AND ALASKA ARE REPORTED TO BE 1.0 FOOT/0.3 METER OR LESS IN HEIGHT.

PRELIMINARY EARTHQUAKE PARAMETERS

MAGNITUDE - 9.0
 TIME - 1000 AKDT MAR 23 2011
 1100 PDT MAR 23 2011
 1800 UTC MAR 23 2011
 LOCATION - 44.2 NORTH 125.0 WEST
 95 MILES/153 KM W OF EUGENE OREGON
 150 MILES/241 KM SW OF PORTLAND OREGON
 DEPTH - 25 MILES/40 KM

PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS WILL BE THE LAST WEST COAST/ALASKA TSUNAMI WARNING CENTER MESSAGE ISSUED FOR THIS EVENT. THIS INFORMATION IS ALSO POSTED AT WCATWC.ARH.NOAA.GOV.

CAZ001-ORZ021-022-002-001-WAZ001-021-510-514>517-BCZ130-230-250-260-280-160-142-141-150-121-122-220-210-922-912-921-911-110-240236-
 /T.CAN.PAAQ.TS.W.0290.000000T0000Z-000000T0000Z/
 COASTAL AREAS BETWEEN AND INCLUDING HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/ TO THE ALASKA-BRITISH COLUMBIA BORDER
 636 PM PDT WED MAR 23 2011

...THE TSUNAMI WARNING IS CANCELED FOR THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON AND BRITISH COLUMBIA FROM HORSE MOUNTAIN CALIFORNIA/50 MILES SW OF EUREKA/ TO THE ALASKA-BRITISH COLUMBIA BORDER...

\$\$

PTWC Pacific Messages

The following messages, created for the PACIFEX 11 tsunami exercise, are representative of the international Pacific products that would be issued by the Pacific Tsunami Warning Center in response to a magnitude 9.0 earthquake and tsunami originating at 44.2°N, 125.0°W.

PTWC Pacific Message #1

WEPA40 PHEB 231806
TSUPAC

TSUNAMI BULLETIN NUMBER 1
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1806Z 23 MAR 2011

THIS BULLETIN APPLIES TO AREAS WITHIN AND BORDERING THE PACIFIC OCEAN AND ADJACENT SEAS... EXCEPT ALASKA... BRITISH COLUMBIA... WASHINGTON... OREGON AND CALIFORNIA.

...A TSUNAMI WARNING AND WATCH ARE IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR MEXICO.

A TSUNAMI WATCH IS IN EFFECT FOR HAWAII.

FOR ALL OTHER PACIFIC AREAS, THIS MESSAGE IS FOR INFORMATION ONLY.

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
COORDINATES - 44.2 NORTH 125.0 WEST
DEPTH - 55 KM
LOCATION - OFFSHORE OREGON
MAGNITUDE - 9.0

EVALUATION

IT IS NOT KNOWN THAT A TSUNAMI WAS GENERATED. THIS WARNING IS BASED ONLY ON THE EARTHQUAKE EVALUATION. AN EARTHQUAKE OF THIS SIZE HAS THE POTENTIAL TO GENERATE A DESTRUCTIVE TSUNAMI THAT CAN STRIKE COASTLINES NEAR THE EPICENTER WITHIN MINUTES AND MORE DISTANT COASTLINES WITHIN HOURS. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THIS CENTER WILL MONITOR SEA LEVEL DATA FROM GAGES NEAR THE EARTHQUAKE TO DETERMINE IF A TSUNAMI WAS GENERATED AND ESTIMATE THE SEVERITY OF THE THREAT.

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES	ARRIVAL TIME
MEXICO	ENSENADA	31.8N 116.8W	2040Z MAR23
	PUNTA ABREOJOS	26.7N 113.6W	2128Z MAR23
	CABO SAN LUCAS	22.8N 110.0W	2209Z MAR23
	SOCORRO	18.8N 111.0W	2227Z MAR23
	MAZATLAN	23.2N 106.4W	2303Z MAR23

	MANZANILLO	19.1N	104.3W	2324Z	MAR23
	ACAPULCO	16.9N	99.9W	0008Z	MAR24
	PUERTO MADERO	14.8N	92.5W	0134Z	MAR24
HAWAII	HILO	19.7N	155.1W	2302Z	MAR23
	NAWILIWILI	22.0N	159.4W	2306Z	MAR23
	HONOLULU	21.3N	157.9W	2312Z	MAR23

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT.
THIS ALERT WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE MESSAGES
FOR ALASKA/ BRITISH COLUMBIA/ WASHINGTON/ OREGON/ CALIFORNIA.

\$\$

PTWC Pacific Message #2

WEPA40 PHEB 231906
TSUPAC

TSUNAMI BULLETIN NUMBER 2
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1906Z 23 MAR 2011

THIS BULLETIN APPLIES TO AREAS WITHIN AND BORDERING THE PACIFIC
OCEAN AND ADJACENT SEAS... EXCEPT ALASKA... BRITISH COLUMBIA...
WASHINGTON... OREGON AND CALIFORNIA.

...A TSUNAMI WARNING AND WATCH ARE IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR
MEXICO.

A TSUNAMI WATCH IS IN EFFECT FOR
HAWAII - MIDWAY IS. - JOHNSTON IS. - RUSSIA - PALMYRA IS.
AND KIRIBATI.

FOR ALL OTHER PACIFIC AREAS, THIS MESSAGE IS FOR INFORMATION ONLY.

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY
NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE
DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND
ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
COORDINATES - 44.2 NORTH 72.6 WEST
DEPTH - 55 KM
LOCATION - OFFSHORE OREGON
MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
CRESCENT CITY CA	41.7 N	124.2 W	1824Z	15.75 FT/4.80 M
CHARLESTON OR	43.3 N	124.3 W	1833Z	11.60 FT/3.55 M
HUMBOLDT BAY CA	40.7 N	124.2 W	1833Z	2.95 FT/0.90 M
BAYOCEAN PEN OR	45.5 N	123.9 W	1835Z	20.67 FT/6.30 M
CANNON BEACH OR	45.9 N	124.0 W	1840Z	23.29 FT/7.10 M
GRENVILLE BAY WA	47.3 N	124.3 W	1842Z	22.31 FT/6.80 M

NEWPORT OR 44.6 N 124.1 W 1842Z 20.34 FT/6.20 M
 WESTPORT WA 46.9 N 124.1 W 1849Z 10.83 FT/3.30 M
 NEAH BAY WA 48.4 N 124.6 W 1853Z 5.58 FT/1.70 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

DEEP-WATER PRESSURE SENSORS INDICATE THAT A TSUNAMI POTENTIALLY DANGEROUS TO REGIONS OUTSIDE THE SOURCE HAS BEEN GENERATED.

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE EPICENTER AND COULD ALSO BE A THREAT TO MORE DISTANT COASTS. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

FOR ALL AREAS - WHEN NO MAJOR WAVES ARE OBSERVED FOR TWO HOURS AFTER THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES	ARRIVAL TIME
MEXICO	ENSENADA	31.8N 116.8W	2040Z MAR23
	PUNTA ABREOJOS	26.7N 113.6W	2128Z MAR23
	CABO SAN LUCAS	22.8N 110.0W	2209Z MAR23
	SOCORRO	18.8N 111.0W	2227Z MAR23
	MAZATLAN	23.2N 106.4W	2303Z MAR23
	MANZANILLO	19.1N 104.3W	2324Z MAR23
	ACAPULCO	16.9N 99.9W	0008Z MAR24
	PUERTO MADERO	14.8N 92.5W	0134Z MAR24
HAWAII	HILO	19.7N 155.1W	2302Z MAR23
	NAWILIWILI	22.0N 159.4W	2306Z MAR23
	HONOLULU	21.3N 157.9W	2312Z MAR23
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	0023Z MAR24
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	0037Z MAR24
RUSSIA	MEDNNY IS	54.7N 167.4E	0038Z MAR24
	UST KAMCHATSK	56.1N 162.6E	0102Z MAR24
	PETROPAVLOVSK K	53.2N 159.6E	0118Z MAR24
	URUP IS	46.1N 150.5E	0207Z MAR24
	SEVERO KURILSK	50.8N 156.1E	0231Z MAR24
PALMYRA IS.	PALMYRA IS.	6.3N 162.4W	0101Z MAR24
KIRIBATI	CHRISTMAS IS.	2.0N 157.5W	0106Z MAR24
	MALDEN IS.	3.9S 154.9W	0137Z MAR24
	FLINT IS.	11.4S 151.8W	0228Z MAR24
	KANTON IS.	2.8S 171.7W	0244Z MAR24
	TARAWA IS.	1.5N 173.0E	0345Z MAR24

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT. THIS ALERT WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE MESSAGES FOR ALASKA/ BRITISH COLUMBIA/ WASHINGTON/ OREGON/ CALIFORNIA.

\$\$

PTWC Pacific Message #3

WEPA40 PHEB 232003
TSUPAC

TSUNAMI BULLETIN NUMBER 3
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 2003Z 23 MAR 2011

THIS BULLETIN APPLIES TO AREAS WITHIN AND BORDERING THE PACIFIC OCEAN AND ADJACENT SEAS... EXCEPT ALASKA... BRITISH COLUMBIA... WASHINGTON... OREGON AND CALIFORNIA.

...A TSUNAMI WARNING AND WATCH ARE IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR MEXICO AND HAWAII.

A TSUNAMI WATCH IS IN EFFECT FOR MIDWAY IS. - JOHNSTON IS. - RUSSIA - PALMYRA IS. - KIRIBATI - JARVIS IS. - GUATEMALA - EL SALVADOR AND FR. POLYNESIA.

FOR ALL OTHER PACIFIC AREAS, THIS MESSAGE IS FOR INFORMATION ONLY.

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
COORDINATES - 44.2 NORTH 72.6 WEST
DEPTH - 55 KM
LOCATION - OFFSHORE OREGON
MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
CRESCENT CITY CA	41.7 N	124.2 W	1824Z	15.75 FT/4.80 M
CHARLESTON OR	43.3 N	124.3 W	1833Z	11.60 FT/3.55 M
HUMBOLDT BAY CA	40.7 N	124.2 W	1833Z	2.95 FT/0.90 M
BAYOCEAN PEN OR	45.5 N	123.9 W	1835Z	20.67 FT/6.30 M
CANNON BEACH OR	45.9 N	124.0 W	1840Z	23.29 FT/7.10 M
GRENVILLE BAY WA	47.3 N	124.3 W	1842Z	22.31 FT/6.80 M
NEWPORT OR	44.6 N	124.1 W	1842Z	20.34 FT/6.20 M
WESTPORT WA	46.9 N	124.1 W	1849Z	10.83 FT/3.30 M
NEAH BAY WA	48.4 N	124.6 W	1853Z	5.58 FT/1.70 M
EUREKA CA	40.8 N	124.2 W	1902Z	11.48 FT/3.50 M
TOFINO BC	49.1 N	125.8 W	1908Z	5.25 FT/1.60 M
ASTORIA OR	46.2 N	123.8 W	1910Z	3.67 FT/1.12 M
N VANCOUVER I	50.8 N	128.4 W	1913Z	4.13 FT/1.26 M
PT REYES CA	38.1 N	122.9 W	1915Z	2.10 FT/0.64 M
MONTEREY CA	36.6 N	121.9 W	1926Z	0.92 FT/0.28 M
PORT ANGELES WA	48.1 N	123.4 W	1931Z	2.46 FT/0.75 M
PORT SAN LUIS CA	35.2 N	120.8 W	1952Z	0.92 FT/0.28 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)

TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

DEEP-WATER PRESSURE SENSORS INDICATE THAT A TSUNAMI POTENTIALLY DANGEROUS TO REGIONS OUTSIDE THE SOURCE HAS BEEN GENERATED.

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE EPICENTER AND COULD ALSO BE A THREAT TO MORE DISTANT COASTS. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

FOR ALL AREAS - WHEN NO MAJOR WAVES ARE OBSERVED FOR TWO HOURS AFTER THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES	ARRIVAL TIME
MEXICO	ENSENADA	31.8N 116.8W	2040Z MAR23
	PUNTA ABREOJOS	26.7N 113.6W	2128Z MAR23
	CABO SAN LUCAS	22.8N 110.0W	2209Z MAR23
	SOCORRO	18.8N 111.0W	2227Z MAR23
	MAZATLAN	23.2N 106.4W	2303Z MAR23
	MANZANILLO	19.1N 104.3W	2324Z MAR23
	ACAPULCO	16.9N 99.9W	0008Z MAR24
	PUERTO MADERO	14.8N 92.5W	0134Z MAR24
HAWAII	HILO	19.7N 155.1W	2302Z MAR23
	NAWILIWILI	22.0N 159.4W	2306Z MAR23
	HONOLULU	21.3N 157.9W	2312Z MAR23
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	0023Z MAR24
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	0037Z MAR24
RUSSIA	MEDNNY IS	54.7N 167.4E	0038Z MAR24
	UST KAMCHATSK	56.1N 162.6E	0102Z MAR24
	PETROPAVLOVSK K	53.2N 159.6E	0118Z MAR24
	URUP IS	46.1N 150.5E	0207Z MAR24
PALMYRA IS.	SEVERO KURILSK	50.8N 156.1E	0231Z MAR24
	PALMYRA IS.	6.3N 162.4W	0101Z MAR24
	KIRIBATI	CHRISTMAS IS.	2.0N 157.5W
MALDEN IS.		3.9S 154.9W	0137Z MAR24
FLINT IS.		11.4S 151.8W	0228Z MAR24
KANTON IS.		2.8S 171.7W	0244Z MAR24
TARAWA IS.		1.5N 173.0E	0345Z MAR24
JARVIS IS.	JARVIS IS.	0.4S 160.1W	0135Z MAR24
GUATEMALA	SIPICATE	13.9N 91.2W	0143Z MAR24
EL SALVADOR	ACAJUTLA	13.6N 89.8W	0154Z MAR24
FR. POLYNESIA	HIVA OA	10.0S 139.0W	0201Z MAR24
	PAPEETE	17.5S 149.6W	0319Z MAR24
	RIKITEA	23.1S 135.0W	0352Z MAR24

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT. THIS ALERT WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE MESSAGES FOR ALASKA/ BRITISH COLUMBIA/ WASHINGTON/ OREGON/ CALIFORNIA.

\$\$

PTWC Pacific Message #4

WEPA40 PHEB 232105
TSUPAC

TSUNAMI BULLETIN NUMBER 4
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 2105Z 23 MAR 2011

THIS BULLETIN APPLIES TO AREAS WITHIN AND BORDERING THE PACIFIC OCEAN AND ADJACENT SEAS... EXCEPT ALASKA... BRITISH COLUMBIA... WASHINGTON... OREGON AND CALIFORNIA.

...A TSUNAMI WARNING AND WATCH ARE IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR MEXICO AND HAWAII.

A TSUNAMI WATCH IS IN EFFECT FOR MIDWAY IS. - JOHNSTON IS. - RUSSIA - PALMYRA IS. - KIRIBATI - JARVIS IS. - GUATEMALA - EL SALVADOR - FR. POLYNESIA - COSTA RICA - COOK ISLANDS - NICARAGUA - WAKE IS. - PANAMA - HOWLAND-BAKER - HONDURAS AND JAPAN.

FOR ALL OTHER PACIFIC AREAS, THIS MESSAGE IS FOR INFORMATION ONLY.

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
COORDINATES - 44.2 NORTH 72.6 WEST
DEPTH - 55 KM
LOCATION - OFFSHORE OREGON
MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
EUREKA CA	40.8 N	124.2 W	1902Z	11.48 FT/3.50 M
TOFINO BC	49.1 N	125.8 W	1908Z	5.25 FT/1.60 M
N VANCOUVER I	50.8 N	128.4 W	1913Z	4.13 FT/1.26 M
PT REYES CA	38.1 N	122.9 W	1915Z	2.10 FT/0.64 M
MONTEREY CA	36.6 N	121.9 W	1926Z	0.92 FT/0.28 M
PORT ANGELES WA	48.1 N	123.4 W	1931Z	2.46 FT/0.75 M
LANGARA BC	54.3 N	133.1 W	2007Z	0.95 FT/0.29 M
SANTA BARBARA CA	34.4 N	119.7 W	2008Z	0.29 FT/0.09 M
SAN PEDRO CA	33.7 N	118.3 W	2024Z	0.56 FT/0.17 M
SANTA MONICA CA	34.0 N	118.5 W	2024Z	0.43 FT/0.13 M
SEATTLE WA	47.6 N	122.3 W	2026Z	0.49 FT/0.15 M
LA JOLLA CA	32.8 N	117.3 W	2038Z	0.56 FT/0.17 M
SITKA AK	57.1 N	135.3 W	2050Z	0.36 FT/0.11 M
PORT SAN LUIS CA	35.2 N	120.8 W	2059Z	1.80 FT/0.55 M
ASTORIA OR	46.2 N	123.8 W	2059Z	3.97 FT/1.21 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.

IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE EPICENTER AND COULD ALSO BE A THREAT TO MORE DISTANT COASTS. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

FOR ALL AREAS - WHEN NO MAJOR WAVES ARE OBSERVED FOR TWO HOURS AFTER THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES	ARRIVAL TIME
MEXICO	ENSENADA	31.8N 116.8W	2040Z MAR23
	PUNTA ABREOJOS	26.7N 113.6W	2128Z MAR23
	CABO SAN LUCAS	22.8N 110.0W	2209Z MAR23
	SOCORRO	18.8N 111.0W	2227Z MAR23
	MAZATLAN	23.2N 106.4W	2303Z MAR23
	MANZANILLO	19.1N 104.3W	2324Z MAR23
	ACAPULCO	16.9N 99.9W	0008Z MAR24
	PUERTO MADERO	14.8N 92.5W	0134Z MAR24
HAWAII	HILO	19.7N 155.1W	2302Z MAR23
	NAWILIWILI	22.0N 159.4W	2306Z MAR23
	HONOLULU	21.3N 157.9W	2312Z MAR23
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	0023Z MAR24
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	0037Z MAR24
RUSSIA	MEDNNY IS	54.7N 167.4E	0038Z MAR24
	UST KAMCHATSK	56.1N 162.6E	0102Z MAR24
	PETROPAVLOVSK K	53.2N 159.6E	0118Z MAR24
	URUP IS	46.1N 150.5E	0207Z MAR24
	SEVERO KURILSK	50.8N 156.1E	0231Z MAR24
PALMYRA IS.	PALMYRA IS.	6.3N 162.4W	0101Z MAR24
KIRIBATI	CHRISTMAS IS.	2.0N 157.5W	0106Z MAR24
	MALDEN IS.	3.9S 154.9W	0137Z MAR24
	FLINT IS.	11.4S 151.8W	0228Z MAR24
	KANTON IS.	2.8S 171.7W	0244Z MAR24
	TARAWA IS.	1.5N 173.0E	0345Z MAR24
JARVIS IS.	JARVIS IS.	0.4S 160.1W	0135Z MAR24
GUATEMALA	SIPICATE	13.9N 91.2W	0143Z MAR24
EL SALVADOR	ACAJUTLA	13.6N 89.8W	0154Z MAR24
FR. POLYNESIA	HIVA OA	10.0S 139.0W	0201Z MAR24
	PAPEETE	17.5S 149.6W	0319Z MAR24
	RIKITEA	23.1S 135.0W	0352Z MAR24
COSTA RICA	CABO SAN ELENA	10.9N 86.0W	0209Z MAR24
	CABO MATAPALO	8.4N 83.3W	0231Z MAR24
	PUERTO QUEPOS	9.4N 84.2W	0239Z MAR24
COOK ISLANDS	PENRHYN IS.	8.9S 157.8W	0223Z MAR24
	PUKAPUKA IS.	10.8S 165.9W	0316Z MAR24
	RAROTONGA	21.2S 159.8W	0405Z MAR24
NICARAGUA	SAN JUAN DL SUR	11.2N 85.9W	0224Z MAR24
	PUERTO SANDINO	12.2N 86.8W	0257Z MAR24
	CORINTO	12.5N 87.2W	0259Z MAR24
WAKE IS.	WAKE IS.	19.3N 166.6E	0235Z MAR24
PANAMA	PUNTA BURICA	8.0N 82.9W	0241Z MAR24
	PUNTA MALA	7.5N 80.0W	0329Z MAR24
	PUERTO PINA	7.4N 78.0W	0342Z MAR24

	BALBOA HTS.	9.0N	79.6W	0451Z	MAR24
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	0244Z	MAR24
HONDURAS	AMAPALA	13.2N	87.6W	0245Z	MAR24
JAPAN	KUSHIRO	42.9N	144.3E	0255Z	MAR24
	HACHINOHE	40.5N	141.5E	0334Z	MAR24
	KATSUURA	35.1N	140.3E	0346Z	MAR24
	SHIMIZU	32.8N	133.0E	0504Z	MAR24
	OKINAWA	26.2N	127.8E	0736Z	MAR24

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT.
THIS ALERT WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE MESSAGES
FOR ALASKA/ BRITISH COLUMBIA/ WASHINGTON/ OREGON/ CALIFORNIA.

\$\$

PTWC Pacific Message #5

WEPA40 PHEB 232204
TSUPAC

TSUNAMI BULLETIN NUMBER 5
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 2204Z 23 MAR 2011

THIS BULLETIN APPLIES TO AREAS WITHIN AND BORDERING THE PACIFIC
OCEAN AND ADJACENT SEAS... EXCEPT ALASKA... BRITISH COLUMBIA...
WASHINGTON... OREGON AND CALIFORNIA.

...A TSUNAMI WARNING AND WATCH ARE IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR
MEXICO - HAWAII - MIDWAY IS. - JOHNSTON IS. - RUSSIA AND
PALMYRA IS.

A TSUNAMI WATCH IS IN EFFECT FOR
KIRIBATI - JARVIS IS. - GUATEMALA - EL SALVADOR - FR.
POLYNESIA - COSTA RICA - COOK ISLANDS - NICARAGUA - WAKE
IS. - PANAMA - HOWLAND-BAKER - HONDURAS - JAPAN - MARSHALL
IS. - ECUADOR - MARCUS IS. - TOKELAU - COLOMBIA - TUVALU
AND AMERICAN SAMOA.

FOR ALL OTHER PACIFIC AREAS, THIS MESSAGE IS FOR INFORMATION ONLY.

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY
NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE
DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND
ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
COORDINATES - 44.2 NORTH 72.6 WEST
DEPTH - 55 KM
LOCATION - OFFSHORE OREGON
MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
SANTA BARBARA CA	34.4 N	119.7 W	2008Z	0.29 FT/0.09 M
SAN PEDRO CA	33.7 N	118.3 W	2024Z	0.56 FT/0.17 M
SANTA MONICA CA	34.0 N	118.5 W	2024Z	0.43 FT/0.13 M

SEATTLE WA	47.6 N	122.3 W	2026Z	0.49 FT/0.15 M
LA JOLLA CA	32.8 N	117.3 W	2038Z	0.56 FT/0.17 M
SITKA AK	57.1 N	135.3 W	2050Z	0.36 FT/0.11 M
PORT SAN LUIS CA	35.2 N	120.8 W	2059Z	1.80 FT/0.55 M
ASTORIA OR	46.2 N	123.8 W	2059Z	3.97 FT/1.21 M
ELFIN COVE AK	58.2 N	136.3 W	2101Z	1.90 FT/0.58 M
LANGARA BC	54.3 N	133.1 W	2123Z	1.18 FT/0.36 M
YAKUTAT AK	59.5 N	139.7 W	2145Z	2.00 FT/0.61 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE EPICENTER AND COULD ALSO BE A THREAT TO MORE DISTANT COASTS. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

FOR ALL AREAS - WHEN NO MAJOR WAVES ARE OBSERVED FOR TWO HOURS AFTER THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES	ARRIVAL TIME

MEXICO	ENSENADA	31.8N 116.8W	2040Z MAR23
	PUNTA ABREOJOS	26.7N 113.6W	2128Z MAR23
	CABO SAN LUCAS	22.8N 110.0W	2209Z MAR23
	SOCORRO	18.8N 111.0W	2227Z MAR23
	MAZATLAN	23.2N 106.4W	2303Z MAR23
	MANZANILLO	19.1N 104.3W	2324Z MAR23
	ACAPULCO	16.9N 99.9W	0008Z MAR24
	PUERTO MADERO	14.8N 92.5W	0134Z MAR24
HAWAII	HILO	19.7N 155.1W	2302Z MAR23
	NAWILIWILI	22.0N 159.4W	2306Z MAR23
	HONOLULU	21.3N 157.9W	2312Z MAR23
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	0023Z MAR24
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	0037Z MAR24
RUSSIA	MEDNNY IS	54.7N 167.4E	0038Z MAR24
	UST KAMCHATSK	56.1N 162.6E	0102Z MAR24
	PETROPAVLOVSK K	53.2N 159.6E	0118Z MAR24
	URUP IS	46.1N 150.5E	0207Z MAR24
	SEVERO KURILSK	50.8N 156.1E	0231Z MAR24
	PALMYRA IS.	PALMYRA IS.	6.3N 162.4W
KIRIBATI	CHRISTMAS IS.	2.0N 157.5W	0106Z MAR24
	MALDEN IS.	3.9S 154.9W	0137Z MAR24
	FLINT IS.	11.4S 151.8W	0228Z MAR24
	KANTON IS.	2.8S 171.7W	0244Z MAR24
	TARAWA IS.	1.5N 173.0E	0345Z MAR24
	JARVIS IS.	JARVIS IS.	0.4S 160.1W
GUATEMALA	SIPICATE	13.9N 91.2W	0143Z MAR24
EL SALVADOR	ACAJUTLA	13.6N 89.8W	0154Z MAR24
FR. POLYNESIA	HIVA OA	10.0S 139.0W	0201Z MAR24
	PAPEETE	17.5S 149.6W	0319Z MAR24
	RIKITEA	23.1S 135.0W	0352Z MAR24

COSTA RICA	CABO SAN ELENA	10.9N	86.0W	0209Z	MAR24
	CABO MATAPALO	8.4N	83.3W	0231Z	MAR24
	PUERTO QUEPOS	9.4N	84.2W	0239Z	MAR24
COOK ISLANDS	PENRHYN IS.	8.9S	157.8W	0223Z	MAR24
	PUKAPUKA IS.	10.8S	165.9W	0316Z	MAR24
	RAROTONGA	21.2S	159.8W	0405Z	MAR24
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	0224Z	MAR24
	PUERTO SANDINO	12.2N	86.8W	0257Z	MAR24
	CORINTO	12.5N	87.2W	0259Z	MAR24
WAKE IS.	WAKE IS.	19.3N	166.6E	0235Z	MAR24
PANAMA	PUNTA BURICA	8.0N	82.9W	0241Z	MAR24
	PUNTA MALA	7.5N	80.0W	0329Z	MAR24
	PUERTO PINA	7.4N	78.0W	0342Z	MAR24
	BALBOA HTS.	9.0N	79.6W	0451Z	MAR24
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	0244Z	MAR24
HONDURAS	AMAPALA	13.2N	87.6W	0245Z	MAR24
JAPAN	KUSHIRO	42.9N	144.3E	0255Z	MAR24
	HACHINOHE	40.5N	141.5E	0334Z	MAR24
	KATSUURA	35.1N	140.3E	0346Z	MAR24
	SHIMIZU	32.8N	133.0E	0504Z	MAR24
	OKINAWA	26.2N	127.8E	0736Z	MAR24
MARSHALL IS.	MAJURO	7.1N	171.4E	0318Z	MAR24
	KWAJALEIN	8.7N	167.7E	0339Z	MAR24
	ENIWETOK	11.4N	162.3E	0352Z	MAR24
ECUADOR	BALTRA IS.	0.5S	90.3W	0319Z	MAR24
	ESMERELDAS	1.2N	79.8W	0358Z	MAR24
	LA LIBERTAD	2.2S	81.2W	0419Z	MAR24
MARCUS IS.	MARCUS IS.	24.3N	154.0E	0319Z	MAR24
TOKELAU	NUKUNONU IS.	9.2S	171.8W	0326Z	MAR24
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	0349Z	MAR24
	TUMACO	1.8N	78.9W	0409Z	MAR24
	BUENAVENTURA	3.8N	77.2W	0451Z	MAR24
TUVALU	FUNAFUTI IS.	7.9S	178.5E	0400Z	MAR24
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0404Z	MAR24

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT.
THIS ALERT WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE MESSAGES
FOR ALASKA/ BRITISH COLUMBIA/ WASHINGTON/ OREGON/ CALIFORNIA.

\$\$

PTWC Pacific Message #6

WEPA40 PHEB 232307
TSUPAC

TSUNAMI BULLETIN NUMBER 6
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 2307Z 23 MAR 2011

THIS BULLETIN APPLIES TO AREAS WITHIN AND BORDERING THE PACIFIC
OCEAN AND ADJACENT SEAS... EXCEPT ALASKA... BRITISH COLUMBIA...
WASHINGTON... OREGON AND CALIFORNIA.

...A TSUNAMI WARNING AND WATCH ARE IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR
MEXICO - HAWAII - MIDWAY IS. - JOHNSTON IS. - RUSSIA -
PALMYRA IS. - KIRIBATI - JARVIS IS. - GUATEMALA - EL
SALVADOR AND FR. POLYNESIA.

A TSUNAMI WATCH IS IN EFFECT FOR
COSTA RICA - COOK ISLANDS - NICARAGUA - WAKE IS. - PANAMA -

HOWLAND-BAKER - HONDURAS - JAPAN - MARSHALL IS. - ECUADOR -
 MARCUS IS. - TOKELAU - COLOMBIA - TUVALU - AMERICAN SAMOA -
 SAMOA - PITCAIRN - WALLIS-FUTUNA - KOSRAE - NIUE - NAURU -
 POHNPEI - PERU AND N. MARIANAS.

FOR ALL OTHER PACIFIC AREAS, THIS MESSAGE IS FOR INFORMATION ONLY.

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY
 NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE
 DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND
 ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
 COORDINATES - 44.2 NORTH 72.6 WEST
 DEPTH - 55 KM
 LOCATION - OFFSHORE OREGON
 MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
 AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
ELFIN COVE AK	58.2 N	136.3 W	2101Z	1.90 FT/0.58 M
LANGARA BC	54.3 N	133.1 W	2123Z	1.18 FT/0.36 M
YAKUTAT AK	59.5 N	139.7 W	2145Z	2.00 FT/0.61 M
SITKA AK	57.1 N	135.3 W	2200Z	0.36 FT/0.11 M
TOFINO BC	49.1 N	125.8 W	2210Z	8.53 FT/2.60 M
SEWARD AK	60.1 N	149.4 W	2216Z	1.97 FT/0.60 M
KODIAK AK	57.8 N	152.4 W	2217Z	0.98 FT/0.30 M
AKUTAN AK	54.1 N	165.8 W	2256Z	0.52 FT/0.16 M
KING COVE AK	55.1 N	162.3 W	0058Z	3.05 FT/0.93 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE
 BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE EPICENTER AND
 COULD ALSO BE A THREAT TO MORE DISTANT COASTS. AUTHORITIES SHOULD
 TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THIS
 CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE
 EXTENT AND SEVERITY OF THE THREAT.

FOR ALL AREAS - WHEN NO MAJOR WAVES ARE OBSERVED FOR TWO HOURS
 AFTER THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT
 OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME
 THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN
 CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL
 CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI ACTION THE
 ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES
 MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME
 BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	COORDINATES	ARRIVAL TIME
MEXICO	ENSENADA	31.8N 116.8W 2040Z MAR23
	PUNTA ABREOJOS	26.7N 113.6W 2128Z MAR23

	CABO SAN LUCAS	22.8N 110.0W	2209Z	MAR23
	SOCORRO	18.8N 111.0W	2227Z	MAR23
	MAZATLAN	23.2N 106.4W	2303Z	MAR23
	MANZANILLO	19.1N 104.3W	2324Z	MAR23
	ACAPULCO	16.9N 99.9W	0008Z	MAR24
	PUERTO MADERO	14.8N 92.5W	0134Z	MAR24
HAWAII	HILO	19.7N 155.1W	2302Z	MAR23
	NAWILIWILI	22.0N 159.4W	2306Z	MAR23
	HONOLULU	21.3N 157.9W	2312Z	MAR23
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	0023Z	MAR24
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	0037Z	MAR24
RUSSIA	MEDNNY IS	54.7N 167.4E	0038Z	MAR24
	UST KAMCHATSK	56.1N 162.6E	0102Z	MAR24
	PETROPVLOVSK K	53.2N 159.6E	0118Z	MAR24
	URUP IS	46.1N 150.5E	0207Z	MAR24
	SEVERO KURILSK	50.8N 156.1E	0231Z	MAR24
PALMYRA IS.	PALMYRA IS.	6.3N 162.4W	0101Z	MAR24
KIRIBATI	CHRISTMAS IS.	2.0N 157.5W	0106Z	MAR24
	MALDEN IS.	3.9S 154.9W	0137Z	MAR24
	FLINT IS.	11.4S 151.8W	0228Z	MAR24
	KANTON IS.	2.8S 171.7W	0244Z	MAR24
	TARAWA IS.	1.5N 173.0E	0345Z	MAR24
JARVIS IS.	JARVIS IS.	0.4S 160.1W	0135Z	MAR24
GUATEMALA	SIPICATE	13.9N 91.2W	0143Z	MAR24
EL SALVADOR	ACAJUTLA	13.6N 89.8W	0154Z	MAR24
FR. POLYNESIA	HIVA OA	10.0S 139.0W	0201Z	MAR24
	PAPEETE	17.5S 149.6W	0319Z	MAR24
	RIKITEA	23.1S 135.0W	0352Z	MAR24
COSTA RICA	CABO SAN ELENA	10.9N 86.0W	0209Z	MAR24
	CABO MATAPALO	8.4N 83.3W	0231Z	MAR24
	PUERTO QUEPOS	9.4N 84.2W	0239Z	MAR24
COOK ISLANDS	PENRHYN IS.	8.9S 157.8W	0223Z	MAR24
	PUKAPUKA IS.	10.8S 165.9W	0316Z	MAR24
	RAROTONGA	21.2S 159.8W	0405Z	MAR24
NICARAGUA	SAN JUAN DL SUR	11.2N 85.9W	0224Z	MAR24
	PUERTO SANDINO	12.2N 86.8W	0257Z	MAR24
	CORINTO	12.5N 87.2W	0259Z	MAR24
WAKE IS.	WAKE IS.	19.3N 166.6E	0235Z	MAR24
PANAMA	PUNTA BURICA	8.0N 82.9W	0241Z	MAR24
	PUNTA MALA	7.5N 80.0W	0329Z	MAR24
	PUERTO PINA	7.4N 78.0W	0342Z	MAR24
	BALBOA HTS.	9.0N 79.6W	0451Z	MAR24
HOWLAND-BAKER	HOWLAND IS.	0.6N 176.6W	0244Z	MAR24
HONDURAS	AMAPALA	13.2N 87.6W	0245Z	MAR24
JAPAN	KUSHIRO	42.9N 144.3E	0255Z	MAR24
	HACHINOHE	40.5N 141.5E	0334Z	MAR24
	KATSUURA	35.1N 140.3E	0346Z	MAR24
	SHIMIZU	32.8N 133.0E	0504Z	MAR24
	OKINAWA	26.2N 127.8E	0736Z	MAR24
MARSHALL IS.	MAJURO	7.1N 171.4E	0318Z	MAR24
	KWAJALEIN	8.7N 167.7E	0339Z	MAR24
	ENIWETOK	11.4N 162.3E	0352Z	MAR24
ECUADOR	BALTRA IS.	0.5S 90.3W	0319Z	MAR24
	ESMERELDAS	1.2N 79.8W	0358Z	MAR24
	LA LIBERTAD	2.2S 81.2W	0419Z	MAR24
MARCUS IS.	MARCUS IS.	24.3N 154.0E	0319Z	MAR24
TOKELAU	NUKUNONU IS.	9.2S 171.8W	0326Z	MAR24
COLOMBIA	BAHIA SOLANO	6.3N 77.4W	0349Z	MAR24
	TUMACO	1.8N 78.9W	0409Z	MAR24
	BUENAVENTURA	3.8N 77.2W	0451Z	MAR24
TUVALU	FUNAFUTI IS.	7.9S 178.5E	0400Z	MAR24
AMERICAN SAMOA	PAGO PAGO	14.3S 170.7W	0404Z	MAR24
SAMOA	APIA	13.8S 171.8W	0405Z	MAR24
PITCAIRN	PITCAIRN IS.	25.1S 130.1W	0406Z	MAR24
WALLIS-FUTUNA	WALLIS IS.	13.3S 176.3W	0417Z	MAR24
KOSRAE	KOSRAE IS.	5.5N 163.0E	0423Z	MAR24
NIUE	NIUE IS.	19.0S 170.0W	0430Z	MAR24
NAURU	NAURU	0.5S 166.9E	0431Z	MAR24

POHNPEI	POHNPEI IS.	7.0N 158.2E	0436Z MAR24
PERU	TALARA	4.6S 81.5W	0441Z MAR24
	PIMENTEL	6.9S 80.0W	0558Z MAR24
	CHIMBOTE	9.0S 78.8W	0607Z MAR24
	LA PUNTA	12.1S 77.2W	0611Z MAR24
	SAN JUAN	15.3S 75.2W	0626Z MAR24
	MOLLENDO	17.1S 72.0W	0658Z MAR24
N. MARIANAS	SAIPAN	15.3N 145.8E	0457Z MAR24

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT.
THIS ALERT WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE MESSAGES
FOR ALASKA/ BRITISH COLUMBIA/ WASHINGTON/ OREGON/ CALIFORNIA.

\$\$

PTWC Pacific Message #7

WEPA40 PHEB 240006
TSUPAC

TSUNAMI BULLETIN NUMBER 7
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 0006Z 24 MAR 2011

THIS BULLETIN APPLIES TO AREAS WITHIN AND BORDERING THE PACIFIC
OCEAN AND ADJACENT SEAS... EXCEPT ALASKA... BRITISH COLUMBIA...
WASHINGTON... OREGON AND CALIFORNIA.

...A TSUNAMI WARNING AND WATCH ARE IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR
MEXICO - HAWAII - MIDWAY IS. - JOHNSTON IS. - RUSSIA -
PALMYRA IS. - KIRIBATI - JARVIS IS. - GUATEMALA - EL
SALVADOR - FR. POLYNESIA - COSTA RICA - COOK ISLANDS -
NICARAGUA - WAKE IS. - PANAMA - HOWLAND-BAKER - HONDURAS
AND JAPAN.

A TSUNAMI WATCH IS IN EFFECT FOR
MARSHALL IS. - ECUADOR - MARCUS IS. - TOKELAU - COLOMBIA -
TUVALU - AMERICAN SAMOA - SAMOA - PITCAIRN - WALLIS-FUTUNA
- KOSRAE - NIUE - NAURU - POHNPEI - PERU - N. MARIANAS -
CHILE - GUAM - TONGA - CHUUK - FIJI - VANUATU - SOLOMON IS.
AND KERMADEC IS.

FOR ALL OTHER PACIFIC AREAS, THIS MESSAGE IS FOR INFORMATION ONLY.

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY
NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE
DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND
ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
COORDINATES - 44.2 NORTH 72.6 WEST
DEPTH - 55 KM
LOCATION - OFFSHORE OREGON
MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
HILO HI	19.7 N	155.1 W	2330Z	4.53 FT/1.38 M
NAWILIWILI HI	22.0 N	159.4 W	2350Z	3.23 FT/1.00 M
HONOLULU HI	21.3 N	157.9 W	2340Z	2.00 FT/0.61 M
SITKA AK	57.1 N	135.3 W	2200Z	0.36 FT/0.11 M
TOFINO BC	49.1 N	125.8 W	2210Z	8.53 FT/2.60 M
SEWARD AK	60.1 N	149.4 W	2216Z	1.97 FT/0.60 M
AKUTAN AK	54.1 N	165.8 W	2256Z	0.52 FT/0.16 M
KING COVE AK	55.1 N	162.3 W	2258Z	3.05 FT/0.93 M
NIKOLSKI AK	52.9 N	168.9 W	2304Z	1.38 FT/0.42 M
PORT ANGELES WA	48.1 N	123.4 W	2305Z	3.61 FT/1.10 M
VALDEZ AK	61.1 N	146.3 W	2315Z	1.18 FT/0.36 M
KODIAK AK	57.8 N	152.4 W	2325Z	2.00 FT/0.61 M
ASTORIA OR	46.2 N	123.8 W	2328Z	4.53 FT/1.38 M
PORT SAN LUIS CA	35.2 N	120.8 W	2345Z	1.94 FT/0.59 M
MONTEREY CA	36.6 N	121.9 W	0000Z	1.15 FT/0.35 M
SANTA BARBARA CA	34.4 N	119.7 W	0000Z	0.59 FT/0.18 M
DUTCH HARBOR AK	53.9 N	166.5 W	0002Z	1.21 FT/0.37 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE EPICENTER AND COULD ALSO BE A THREAT TO MORE DISTANT COASTS. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

FOR ALL AREAS - WHEN NO MAJOR WAVES ARE OBSERVED FOR TWO HOURS AFTER THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	COORDINATES	ARRIVAL TIME
MEXICO	ENSENADA	31.8N 116.8W 2040Z MAR23
	PUNTA ABREOJOS	26.7N 113.6W 2128Z MAR23
	CABO SAN LUCAS	22.8N 110.0W 2209Z MAR23
	SOCORRO	18.8N 111.0W 2227Z MAR23
	MAZATLAN	23.2N 106.4W 2303Z MAR23
	MANZANILLO	19.1N 104.3W 2324Z MAR23
	ACAPULCO	16.9N 99.9W 0008Z MAR24
	PUERTO MADERO	14.8N 92.5W 0134Z MAR24
HAWAII	HILO	19.7N 155.1W 2302Z MAR23
	NAWILIWILI	22.0N 159.4W 2306Z MAR23
	HONOLULU	21.3N 157.9W 2312Z MAR23
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W 0023Z MAR24
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W 0037Z MAR24
RUSSIA	MEDNNY IS	54.7N 167.4E 0038Z MAR24
	UST KAMCHATSK	56.1N 162.6E 0102Z MAR24
	PETROPAVLOVSK K	53.2N 159.6E 0118Z MAR24
	URUP IS	46.1N 150.5E 0207Z MAR24
	SEVERO KURILSK	50.8N 156.1E 0231Z MAR24

PALMYRA IS.	PALMYRA IS.	6.3N 162.4W	0101Z	MAR24
KIRIBATI	CHRISTMAS IS.	2.0N 157.5W	0106Z	MAR24
	MALDEN IS.	3.9S 154.9W	0137Z	MAR24
	FLINT IS.	11.4S 151.8W	0228Z	MAR24
	KANTON IS.	2.8S 171.7W	0244Z	MAR24
	TARAWA IS.	1.5N 173.0E	0345Z	MAR24
JARVIS IS.	JARVIS IS.	0.4S 160.1W	0135Z	MAR24
GUATEMALA	SIPICATE	13.9N 91.2W	0143Z	MAR24
EL SALVADOR	ACAJUTLA	13.6N 89.8W	0154Z	MAR24
FR. POLYNESIA	HIVA OA	10.0S 139.0W	0201Z	MAR24
	PAPEETE	17.5S 149.6W	0319Z	MAR24
	RIKITEA	23.1S 135.0W	0352Z	MAR24
COSTA RICA	CABO SAN ELENA	10.9N 86.0W	0209Z	MAR24
	CABO MATAPALO	8.4N 83.3W	0231Z	MAR24
	PUERTO QUEPOS	9.4N 84.2W	0239Z	MAR24
COOK ISLANDS	PENRHYN IS.	8.9S 157.8W	0223Z	MAR24
	PUKAPUKA IS.	10.8S 165.9W	0316Z	MAR24
	RAROTONGA	21.2S 159.8W	0405Z	MAR24
NICARAGUA	SAN JUAN DL SUR	11.2N 85.9W	0224Z	MAR24
	PUERTO SANDINO	12.2N 86.8W	0257Z	MAR24
	CORINTO	12.5N 87.2W	0259Z	MAR24
WAKE IS.	WAKE IS.	19.3N 166.6E	0235Z	MAR24
PANAMA	PUNTA BURICA	8.0N 82.9W	0241Z	MAR24
	PUNTA MALA	7.5N 80.0W	0329Z	MAR24
	PUERTO PINA	7.4N 78.0W	0342Z	MAR24
	BALBOA HTS.	9.0N 79.6W	0451Z	MAR24
HOWLAND-BAKER	HOWLAND IS.	0.6N 176.6W	0244Z	MAR24
HONDURAS	AMAPALA	13.2N 87.6W	0245Z	MAR24
JAPAN	KUSHIRO	42.9N 144.3E	0255Z	MAR24
	HACHINOHE	40.5N 141.5E	0334Z	MAR24
	KATSUURA	35.1N 140.3E	0346Z	MAR24
	SHIMIZU	32.8N 133.0E	0504Z	MAR24
	OKINAWA	26.2N 127.8E	0736Z	MAR24
MARSHALL IS.	MAJURO	7.1N 171.4E	0318Z	MAR24
	KWAJALEIN	8.7N 167.7E	0339Z	MAR24
	ENIWETOK	11.4N 162.3E	0352Z	MAR24
ECUADOR	BALTRA IS.	0.5S 90.3W	0319Z	MAR24
	ESMERELDAS	1.2N 79.8W	0358Z	MAR24
	LA LIBERTAD	2.2S 81.2W	0419Z	MAR24
MARCUS IS.	MARCUS IS.	24.3N 154.0E	0319Z	MAR24
TOKELAU	NUKUNONU IS.	9.2S 171.8W	0326Z	MAR24
COLOMBIA	BAHIA SOLANO	6.3N 77.4W	0349Z	MAR24
	TUMACO	1.8N 78.9W	0409Z	MAR24
	BUENAVENTURA	3.8N 77.2W	0451Z	MAR24
TUVALU	FUNAFUTI IS.	7.9S 178.5E	0400Z	MAR24
AMERICAN SAMOA	PAGO PAGO	14.3S 170.7W	0404Z	MAR24
SAMOA	APIA	13.8S 171.8W	0405Z	MAR24
PITCAIRN	PITCAIRN IS.	25.1S 130.1W	0406Z	MAR24
WALLIS-FUTUNA	WALLIS IS.	13.3S 176.3W	0417Z	MAR24
KOSRAE	KOSRAE IS.	5.5N 163.0E	0423Z	MAR24
NIUE	NIUE IS.	19.0S 170.0W	0430Z	MAR24
NAURU	NAURU	0.5S 166.9E	0431Z	MAR24
POHNPEI	POHNPEI IS.	7.0N 158.2E	0436Z	MAR24
PERU	TALARA	4.6S 81.5W	0441Z	MAR24
	PIMENTEL	6.9S 80.0W	0558Z	MAR24
	CHIMBOTE	9.0S 78.8W	0607Z	MAR24
	LA PUNTA	12.1S 77.2W	0611Z	MAR24
	SAN JUAN	15.3S 75.2W	0626Z	MAR24
	MOLLENDO	17.1S 72.0W	0658Z	MAR24
CHILE	EASTER IS.	27.1S 109.4W	0515Z	MAR24
	IQUIQUE	20.2S 70.1W	0715Z	MAR24
	ARICA	18.5S 70.3W	0720Z	MAR24
	ANTOFAGASTA	23.3S 70.4W	0738Z	MAR24
	CALDERA	27.1S 70.8W	0755Z	MAR24
	COQUIMBO	29.9S 71.4W	0816Z	MAR24
	VALPARAISO	33.0S 71.6W	0839Z	MAR24
	TALCAHUANO	36.7S 73.1W	0925Z	MAR24
	CORRAL	39.8S 73.5W	0929Z	MAR24

	GOLFO DE PENAS	47.1S	74.9W	1026Z	MAR24
	PUERTO MONTT	41.5S	73.0W	1237Z	MAR24
	PUERTO WILLIAMS	54.8S	68.2W	1308Z	MAR24
	PUNTA ARENAS	53.2S	70.9W	1328Z	MAR24
GUAM	GUAM	13.4N	144.7E	0518Z	MAR24
TONGA	NUKUALOFA	21.0S	175.2W	0519Z	MAR24
CHUUK	CHUUK IS.	7.4N	151.8E	0535Z	MAR24
FIJI	SUVA	18.1S	178.4E	0556Z	MAR24
VANUATU	ESPERITU SANTO	15.1S	167.3E	0557Z	MAR24
	ANATOM IS.	20.2S	169.9E	0631Z	MAR24
SOLOMON IS.	KIRAKIRA	10.4S	161.9E	0559Z	MAR24
	GHATERE	7.8S	159.2E	0621Z	MAR24
	AUKI	8.8S	160.6E	0623Z	MAR24
	PANGGOE	6.9S	157.2E	0634Z	MAR24
	HONIARA	9.3S	160.0E	0636Z	MAR24
	MUNDA	8.4S	157.2E	0654Z	MAR24
	FALAMAE	7.4S	155.6E	0705Z	MAR24
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0601Z	MAR24

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT.
THIS ALERT WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE MESSAGES
FOR ALASKA/ BRITISH COLUMBIA/ WASHINGTON/ OREGON/ CALIFORNIA.

\$\$

PTWC Pacific Message #8

WEPA40 PHEB 240103
TSUPAC

TSUNAMI BULLETIN NUMBER 8
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 0103Z 24 MAR 2011

THIS BULLETIN APPLIES TO AREAS WITHIN AND BORDERING THE PACIFIC
OCEAN AND ADJACENT SEAS... EXCEPT ALASKA... BRITISH COLUMBIA...
WASHINGTON... OREGON AND CALIFORNIA.

THE TSUNAMI WATCH AND WARNING ARE CANCELED FOR ALL COASTAL AREAS
AND ISLANDS IN THE PACIFIC.

THIS BULLETIN IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY
NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE
DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND
ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
COORDINATES - 44.2 NORTH 72.6 WEST
DEPTH - 55 KM
LOCATION - OFFSHORE OREGON
MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
-----	----	-----	-----	-----
HILO HI	19.7 N	155.1 W	2330Z	4.53 FT/1.38 M

NAWILIWILI HI	22.0 N	159.4 W	2350Z	3.23 FT/1.00 M
HONOLULU HI	21.3 N	157.9 W	2340Z	2.00 FT/0.61 M
NIKOLSKI AK	52.9 N	168.9 W	2304	1.38 FT/0.42 M
PORT ANGELES WA	48.1 N	123.4 W	2305	3.61 FT/1.10 M
KODIAK AK	57.8 N	152.4 W	2325	2.00 FT/0.61 M
ASTORIA OR	46.2 N	123.8 W	2328	4.53 FT/1.38 M
PORT SAN LUIS CA	35.2 N	120.8 W	2345	1.94 FT/0.59 M
MONTEREY CA	36.6 N	121.9 W	0000	1.15 FT/0.35 M
SANTA BARBARA CA	34.4 N	119.7 W	0000	0.59 FT/0.18 M
DUTCH HARBOR AK	53.9 N	166.5 W	0002	1.21 FT/0.37 M
SANTA MONICA CA	34.0 N	118.5 W	0004	0.69 FT/0.21 M
VALDEZ AK	61.1 N	146.3 W	0010	1.54 FT/0.47 M
PORT SAN LUIS CA	35.2 N	120.8 W	0045	2.23 FT/0.68 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE EPICENTER. FOR THOSE AREAS - WHEN NO MAJOR WAVES ARE OBSERVED FOR TWO HOURS AFTER THE ESTIMATED TIME OF ARRIVAL OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

NO TSUNAMI THREAT EXISTS FOR OTHER COASTAL AREAS IN THE PACIFIC ALTHOUGH SOME OTHER AREAS MAY EXPERIENCE NON-DAMAGING SEA LEVEL CHANGES. THIS TSUNAMI WARNING AND WATCH ARE CANCELLED.

THIS WILL BE THE FINAL MESSAGE ISSUED FOR THIS EVENT UNLESS ADDITIONAL INFORMATION BECOMES AVAILABLE.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE MESSAGES FOR ALASKA/ BRITISH COLUMBIA/ WASHINGTON/ OREGON/ CALIFORNIA.

\$\$

PTWC Hawaii Messages

The following messages, created for the PACIFEX 11 tsunami exercise, are representative of the Hawaii products that would be issued by the Pacific Tsunami Warning Center in response to a magnitude 9.0 earthquake and tsunami originating at 44.2°N, 125.0°W.

PTWC Hawaii Message #1

WEHW40 PHEB 231808
 TSUHWX
 HIZ001>003-005>009-012>014-016>021-023>026-231908-
 /T.NEW.PHEB.TS.A.0290.110323T1808Z-000000T0000Z/

BULLETIN
 TSUNAMI MESSAGE NUMBER 1
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
 0808 AM HST WED MAR 23 2011

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WATCH BULLETIN...

A TSUNAMI WATCH IS ISSUED FOR THE STATE OF HAWAII EFFECTIVE AT 808 AM HST.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
 COORDINATES - 44.2 NORTH 72.6 WEST
 DEPTH - 55 KM
 LOCATION - OFFSHORE OREGON
 MAGNITUDE - 9.0

EVALUATION
 BASED ON ALL AVAILABLE DATA A TSUNAMI MAY HAVE BEEN GENERATED BY THIS EARTHQUAKE THAT COULD BE DESTRUCTIVE ON COASTAL AREAS EVEN FAR FROM THE EPICENTER. AN INVESTIGATION IS UNDERWAY TO DETERMINE IF THERE IS A TSUNAMI THREAT TO HAWAII.

THE ESTIMATED ARRIVAL TIME IN HAWAII OF THE FIRST TSUNAMI WAVE IS
 0102 PM HST WED 23 MAR 2011

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

\$\$

PTWC Hawaii Message #2

WEHW40 PHEB 231907
 TSUHWX
 HIZ001>003-005>009-012>014-016>021-023>026-232007-
 /T.CON.PHEB.TS.A.0290.000000T0000Z-000000T0000Z/

BULLETIN
 TSUNAMI MESSAGE NUMBER 3
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
 0907 AM HST WED MAR 23 2011

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

TSUNAMI WATCH SUPPLEMENT.

A TSUNAMI WATCH CONTINUES IN EFFECT FOR THE STATE OF HAWAII.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
 COORDINATES - 44.2 NORTH 72.6 WEST
 DEPTH - 55 KM
 LOCATION - OFFSHORE OREGON
 MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
CRESCENT CITY CA	41.7 N	124.2 W	1824Z	15.75 FT/4.80 M
CHARLESTON OR	43.3 N	124.3 W	1833Z	11.60 FT/3.55 M
HUMBOLDT BAY CA	40.7 N	124.2 W	1833Z	2.95 FT/0.90 M
NEWPORT OR	44.6 N	124.1 W	1842Z	20.34 FT/6.20 M
WESTPORT WA	46.9 N	124.1 W	1849Z	10.83 FT/3.30 M
NEAH BAY WA	48.4 N	124.6 W	1853Z	5.58 FT/1.70 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

DEEP-WATER PRESSURE SENSORS INDICATE THAT A TSUNAMI HAS BEEN GENERATED WHICH IS POTENTIALLY DANGEROUS OUTSIDE THE SOURCE REGION.

EVALUATION

BASED ON ALL AVAILABLE DATA A TSUNAMI MAY HAVE BEEN GENERATED BY THIS EARTHQUAKE THAT COULD BE DESTRUCTIVE ON COASTAL AREAS EVEN FAR FROM THE EPICENTER. AN INVESTIGATION IS UNDERWAY TO DETERMINE IF THERE IS A TSUNAMI THREAT TO HAWAII.

THE ESTIMATED ARRIVAL TIME IN HAWAII OF THE FIRST TSUNAMI WAVE IS

0102 PM HST WED 23 MAR 2011

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

\$\$

PTWC Hawaii Message #3

WEHW40 PHEB 232006
 TSUHWX
 HIZ001>003-005>009-012>014-016>021-023>026-232106-
 /T.CAN.PHEB.TS.A.0290.000000T0000Z-000000T0000Z/
 /T.NEW.PHEB.TS.W.0290.110323T2006Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED
 TSUNAMI MESSAGE NUMBER 3
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
 1006 AM HST WED MAR 23 2011

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING BULLETIN...

A TSUNAMI WARNING IS ISSUED FOR THE STATE OF HAWAII EFFECTIVE

AT 1006 AM HST.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
 COORDINATES - 44.2 NORTH 72.6 WEST
 DEPTH - 55 KM
 LOCATION - OFFSHORE OREGON
 MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
CRESCENT CITY CA	41.7 N	124.2 W	1824Z	15.75 FT/4.80 M
CHARLESTON OR	43.3 N	124.3 W	1833Z	11.60 FT/3.55 M
HUMBOLDT BAY CA	40.7 N	124.2 W	1833Z	2.95 FT/0.90 M
NEWPORT OR	44.6 N	124.1 W	1842Z	20.34 FT/6.20 M
WESTPORT WA	46.9 N	124.1 W	1849Z	10.83 FT/3.30 M
NEAH BAY WA	48.4 N	124.6 W	1853Z	5.58 FT/1.70 M
TOFINO BC	49.1 N	125.8 W	1908Z	5.25 FT/1.60 M
ASTORIA OR	46.2 N	123.8 W	1910Z	3.67 FT/1.12 M
N VANCOUVER I	50.8 N	128.4 W	1913Z	4.13 FT/1.26 M
PT REYES CA	38.1 N	122.9 W	1915Z	2.10 FT/0.64 M
MONTEREY CA	36.6 N	121.9 W	1926Z	0.92 FT/0.28 M
PORT ANGELES WA	48.1 N	123.4 W	1931Z	2.46 FT/0.75 M
PORT SAN LUIS CA	35.2 N	120.8 W	1952Z	0.92 FT/0.28 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

DEEP-WATER PRESSURE SENSORS INDICATE THAT A TSUNAMI HAS BEEN GENERATED WHICH IS POTENTIALLY DANGEROUS OUTSIDE THE SOURCE REGION.

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE ALONG COASTLINES OF ALL ISLANDS IN THE STATE OF HAWAII. URGENT ACTION SHOULD BE TAKEN TO PROTECT LIVES AND PROPERTY.

A TSUNAMI IS A SERIES OF LONG OCEAN WAVES. EACH INDIVIDUAL WAVE CREST CAN LAST 5 TO 15 MINUTES OR MORE AND EXTENSIVELY FLOOD COASTAL AREAS. THE DANGER CAN CONTINUE FOR MANY HOURS AFTER THE INITIAL WAVE AS SUBSEQUENT WAVES ARRIVE. TSUNAMI WAVE HEIGHTS CANNOT BE FORECASTED AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMIS EFFECTIVELY WRAP AROUND ISLANDS. ALL SHORES ARE AT RISK NO MATTER WHICH DIRECTION THEY FACE. THE TROUGH OF A TSUNAMI MAY TEMPORARILY EXPOSE THE SEAFLOOR BUT THE AREA WILL QUICKLY FLOOD AGAIN. EXTREMELY STRONG AND UNUSUAL NEARSHORE CURRENTS CAN ACCOMPANY A TSUNAMI. DEBRIS PICKED UP AND CARRIED BY A TSUNAMI AMPLIFIES ITS DESTRUCTIVE POWER. SIMULTANEOUS HIGH TIDES OR HIGH SURF CAN SIGNIFICANTLY INCREASE THE TSUNAMI HAZARD

THE ESTIMATED ARRIVAL TIME IN HAWAII OF THE FIRST TSUNAMI WAVE IS

0102 PM HST WED 23 MAR 2011

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

\$\$

PTWC Hawaii Message #4

WEHW40 PHEB 232106
 TSUHWX
 HIZ001>003-005>009-012>014-016>021-023>026-232206-
 /T.CON.PHEB.TS.W.0290.000000T0000Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED
 TSUNAMI MESSAGE NUMBER 4
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
 1106 AM HST WED MAR 23 2011

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING SUPPLEMENT...

A TSUNAMI WARNING CONTINUES IN EFFECT FOR THE STATE OF HAWAII.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
 COORDINATES - 44.2 NORTH 72.6 WEST
 DEPTH - 55 KM
 LOCATION - OFFSHORE OREGON
 MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
 AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
TOFINO BC	49.1 N	125.8 W	1908Z	5.25 FT/1.60 M
N VANCOUVER I	50.8 N	128.4 W	1913Z	4.13 FT/1.26 M
PT REYES CA	38.1 N	122.9 W	1915Z	2.10 FT/0.64 M
MONTEREY CA	36.6 N	121.9 W	1926Z	0.92 FT/0.28 M
PORT ANGELES WA	48.1 N	123.4 W	1931Z	2.46 FT/0.75 M
LANGARA BC	54.3 N	133.1 W	2007Z	0.95 FT/0.29 M
SANTA BARBARA CA	34.4 N	119.7 W	2008Z	0.29 FT/0.09 M
SAN PEDRO CA	33.7 N	118.3 W	2024Z	0.56 FT/0.17 M
SANTA MONICA CA	34.0 N	118.5 W	2024Z	0.43 FT/0.13 M
SEATTLE WA	47.6 N	122.3 W	2026Z	0.49 FT/0.15 M
LA JOLLA CA	32.8 N	117.3 W	2038Z	0.56 FT/0.17 M
SITKA AK	57.1 N	135.3 W	2050Z	0.36 FT/0.11 M
PORT SAN LUIS CA	35.2 N	120.8 W	2059Z	1.80 FT/0.55 M
ASTORIA OR	46.2 N	123.8 W	2059Z	3.97 FT/1.21 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE ALONG
 COASTLINES OF ALL ISLANDS IN THE STATE OF HAWAII. URGENT ACTION
 SHOULD BE TAKEN TO PROTECT LIVES AND PROPERTY.

A TSUNAMI IS A SERIES OF LONG OCEAN WAVES. EACH INDIVIDUAL WAVE
 CREST CAN LAST 5 TO 15 MINUTES OR MORE AND EXTENSIVELY FLOOD
 COASTAL AREAS. THE DANGER CAN CONTINUE FOR MANY HOURS AFTER THE
 INITIAL WAVE AS SUBSEQUENT WAVES ARRIVE. TSUNAMI WAVE HEIGHTS
 CANNOT BE FORECASTED AND THE FIRST WAVE MAY NOT BE THE LARGEST.
 TSUNAMIS EFFECTIVELY WRAP AROUND ISLANDS. ALL SHORES ARE AT
 RISK NO MATTER WHICH DIRECTION THEY FACE. THE TROUGH OF A TSUNAMI
 MAY TEMPORARILY EXPOSE THE SEAFLOOR BUT THE AREA WILL QUICKLY

FLOOD AGAIN. EXTREMELY STRONG AND UNUSUAL NEARSHORE CURRENTS CAN ACCOMPANY A TSUNAMI. DEBRIS PICKED UP AND CARRIED BY A TSUNAMI AMPLIFIES ITS DESTRUCTIVE POWER. SIMULTANEOUS HIGH TIDES OR HIGH SURF CAN SIGNIFICANTLY INCREASE THE TSUNAMI HAZARD

THE ESTIMATED ARRIVAL TIME IN HAWAII OF THE FIRST TSUNAMI WAVE IS

0102 PM HST WED 23 MAR 2011

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

\$\$

PTWC Hawaii Message #5

WEHW40 PHEB 232206
 TSUHWX
 HIZ001>003-005>009-012>014-016>021-023>026-232306-
 /T.CON.PHEB.TS.W.0290.000000T0000Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED
 TSUNAMI MESSAGE NUMBER 5
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
 1206 PM HST WED MAR 23 2011

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING SUPPLEMENT...

A TSUNAMI WARNING CONTINUES IN EFFECT FOR THE STATE OF HAWAII.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
 COORDINATES - 44.2 NORTH 72.6 WEST
 DEPTH - 55 KM
 LOCATION - OFFSHORE OREGON
 MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
SANTA BARBARA CA	34.4 N	119.7 W	2008Z	0.29 FT/0.09 M
SAN PEDRO CA	33.7 N	118.3 W	2024Z	0.56 FT/0.17 M
SANTA MONICA CA	34.0 N	118.5 W	2024Z	0.43 FT/0.13 M
SEATTLE WA	47.6 N	122.3 W	2026Z	0.49 FT/0.15 M
LA JOLLA CA	32.8 N	117.3 W	2038Z	0.56 FT/0.17 M
SITKA AK	57.1 N	135.3 W	2050Z	0.36 FT/0.11 M
PORT SAN LUIS CA	35.2 N	120.8 W	2059Z	1.80 FT/0.55 M
ASTORIA OR	46.2 N	123.8 W	2059Z	3.97 FT/1.21 M
ELFIN COVE AK	58.2 N	136.3 W	2101Z	1.90 FT/0.58 M
LANGARA BC	54.3 N	133.1 W	2123Z	1.18 FT/0.36 M
YAKUTAT AK	59.5 N	139.7 W	2145Z	2.00 FT/0.61 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE ALONG COASTLINES OF ALL ISLANDS IN THE STATE OF HAWAII. URGENT ACTION

SHOULD BE TAKEN TO PROTECT LIVES AND PROPERTY.

A TSUNAMI IS A SERIES OF LONG OCEAN WAVES. EACH INDIVIDUAL WAVE CREST CAN LAST 5 TO 15 MINUTES OR MORE AND EXTENSIVELY FLOOD COASTAL AREAS. THE DANGER CAN CONTINUE FOR MANY HOURS AFTER THE INITIAL WAVE AS SUBSEQUENT WAVES ARRIVE. TSUNAMI WAVE HEIGHTS CANNOT BE FORECASTED AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMIS EFFECTIVELY WRAP AROUND ISLANDS. ALL SHORES ARE AT RISK NO MATTER WHICH DIRECTION THEY FACE. THE TROUGH OF A TSUNAMI MAY TEMPORARILY EXPOSE THE SEAFLOOR BUT THE AREA WILL QUICKLY FLOOD AGAIN. EXTREMELY STRONG AND UNUSUAL NEARSHORE CURRENTS CAN ACCOMPANY A TSUNAMI. DEBRIS PICKED UP AND CARRIED BY A TSUNAMI AMPLIFIES ITS DESTRUCTIVE POWER. SIMULTANEOUS HIGH TIDES OR HIGH SURF CAN SIGNIFICANTLY INCREASE THE TSUNAMI HAZARD

THE ESTIMATED ARRIVAL TIME IN HAWAII OF THE FIRST TSUNAMI WAVE IS

0102 PM HST WED 23 MAR 2011

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

\$\$

PTWC Hawaii Message #6

WEHW40 PHEB 232307
 TSUHWX
 HIZ001>003-005>009-012>014-016>021-023>026-240007-
 /T.CON.PHEB.TS.W.0290.000000T0000Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED
 TSUNAMI MESSAGE NUMBER 6
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
 107 PM HST WED MAR 23 2011

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING SUPPLEMENT...

A TSUNAMI WARNING CONTINUES IN EFFECT FOR THE STATE OF HAWAII.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
 COORDINATES - 44.2 NORTH 72.6 WEST
 DEPTH - 55 KM
 LOCATION - OFFSHORE OREGON
 MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
ELFIN COVE AK	58.2 N	136.3 W	2101Z	1.90 FT/0.58 M
LANGARA BC	54.3 N	133.1 W	2123Z	1.18 FT/0.36 M
YAKUTAT AK	59.5 N	139.7 W	2145Z	2.00 FT/0.61 M
SITKA AK	57.1 N	135.3 W	2200Z	0.36 FT/0.11 M
TOFINO BC	49.1 N	125.8 W	2210Z	8.53 FT/2.60 M
SEWARD AK	60.1 N	149.4 W	2216Z	1.97 FT/0.60 M
KODIAK AK	57.8 N	152.4 W	2217Z	0.98 FT/0.30 M
AKUTAN AK	54.1 N	165.8 W	2256Z	0.52 FT/0.16 M
KING COVE AK	55.1 N	162.3 W	2258Z	3.05 FT/0.93 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)

TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE ALONG COASTLINES OF ALL ISLANDS IN THE STATE OF HAWAII. URGENT ACTION SHOULD BE TAKEN TO PROTECT LIVES AND PROPERTY.

A TSUNAMI IS A SERIES OF LONG OCEAN WAVES. EACH INDIVIDUAL WAVE CREST CAN LAST 5 TO 15 MINUTES OR MORE AND EXTENSIVELY FLOOD COASTAL AREAS. THE DANGER CAN CONTINUE FOR MANY HOURS AFTER THE INITIAL WAVE AS SUBSEQUENT WAVES ARRIVE. TSUNAMI WAVE HEIGHTS CANNOT BE FORECASTED AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMIS EFFECTIVELY WRAP AROUND ISLANDS. ALL SHORES ARE AT RISK NO MATTER WHICH DIRECTION THEY FACE. THE TROUGH OF A TSUNAMI MAY TEMPORARILY EXPOSE THE SEAFLOOR BUT THE AREA WILL QUICKLY FLOOD AGAIN. EXTREMELY STRONG AND UNUSUAL NEARSHORE CURRENTS CAN ACCOMPANY A TSUNAMI. DEBRIS PICKED UP AND CARRIED BY A TSUNAMI AMPLIFIES ITS DESTRUCTIVE POWER. SIMULTANEOUS HIGH TIDES OR HIGH SURF CAN SIGNIFICANTLY INCREASE THE TSUNAMI HAZARD

THE ESTIMATED ARRIVAL TIME IN HAWAII OF THE FIRST TSUNAMI WAVE IS

0102 PM HST WED 23 MAR 2011

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

\$\$

PTWC Hawaii Message #7

WEHW40 PHEB 240007
 TSUHWX
 HIZ001>003-005>009-012>014-016>021-023>026-240107-
 /T.CON.PHEB.TS.W.0290.000000T0000Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED
 TSUNAMI MESSAGE NUMBER 6
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
 207 PM HST WED MAR 23 2011

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING SUPPLEMENT...

A TSUNAMI WARNING CONTINUES IN EFFECT FOR THE STATE OF HAWAII.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
 COORDINATES - 44.2 NORTH 72.6 WEST
 DEPTH - 55 KM
 LOCATION - OFFSHORE OREGON
 MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
HILO HI	19.7 N	155.1 W	2330Z	4.53 FT/1.38 M
NAWILIWILI HI	22.0 N	159.4 W	2350Z	3.23 FT/1.00 M
HONOLULU HI	21.3 N	157.9 W	2340Z	2.00 FT/0.61 M

ELFIN COVE AK	58.2 N	136.3 W	2101Z	1.90 FT/0.58 M
LANGARA BC	54.3 N	133.1 W	2123Z	1.18 FT/0.36 M
YAKUTAT AK	59.5 N	139.7 W	2145Z	2.00 FT/0.61 M
SITKA AK	57.1 N	135.3 W	2200Z	0.36 FT/0.11 M
TOFINO BC	49.1 N	125.8 W	2210Z	8.53 FT/2.60 M
SEWARD AK	60.1 N	149.4 W	2216Z	1.97 FT/0.60 M
KODIAK AK	57.8 N	152.4 W	2217Z	0.98 FT/0.30 M
AKUTAN AK	54.1 N	165.8 W	2256Z	0.52 FT/0.16 M
KING COVE AK	55.1 N	162.3 W	2258Z	3.05 FT/0.93 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE DAMAGE ALONG COASTLINES OF ALL ISLANDS IN THE STATE OF HAWAII. URGENT ACTION SHOULD BE TAKEN TO PROTECT LIVES AND PROPERTY.

A TSUNAMI IS A SERIES OF LONG OCEAN WAVES. EACH INDIVIDUAL WAVE CREST CAN LAST 5 TO 15 MINUTES OR MORE AND EXTENSIVELY FLOOD COASTAL AREAS. THE DANGER CAN CONTINUE FOR MANY HOURS AFTER THE INITIAL WAVE AS SUBSEQUENT WAVES ARRIVE. TSUNAMI WAVE HEIGHTS CANNOT BE FORECASTED AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMIS EFFECTIVELY WRAP AROUND ISLANDS. ALL SHORES ARE AT RISK NO MATTER WHICH DIRECTION THEY FACE. THE TROUGH OF A TSUNAMI MAY TEMPORARILY EXPOSE THE SEAFLOOR BUT THE AREA WILL QUICKLY FLOOD AGAIN. EXTREMELY STRONG AND UNUSUAL NEARSHORE CURRENTS CAN ACCOMPANY A TSUNAMI. DEBRIS PICKED UP AND CARRIED BY A TSUNAMI AMPLIFIES ITS DESTRUCTIVE POWER. SIMULTANEOUS HIGH TIDES OR HIGH SURF CAN SIGNIFICANTLY INCREASE THE TSUNAMI HAZARD

THE ESTIMATED ARRIVAL TIME IN HAWAII OF THE FIRST TSUNAMI WAVE IS

0102 PM HST WED 23 MAR 2011

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

\$\$

PTWC Hawaii Message #8

WEHW40 PHEB 240108
 TSUHWX
 HIZ001>003-005>009-012>014-016>021-023>026-240208-
 /T.CAN.PHEB.TS.W.0290.000000T0000Z-000000T0000Z/

BULLETIN

TSUNAMI MESSAGE NUMBER 7
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
 308 PM HST WED MAR 23 2011

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING CANCELLATION...

THE TSUNAMI WARNING IS CANCELLED FOR THE STATE OF HAWAII EFFECTIVE AT 308 PM HST.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1800Z 23 MAR 2011
 COORDINATES - 44.2 NORTH 72.6 WEST
 DEPTH - 55 KM
 LOCATION - OFFSHORE OREGON

MAGNITUDE - 9.0

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES -

LOCATION	LAT	LON	TIME	AMPL
HILO HI	19.7 N	155.1 W	2330Z	4.53 FT/1.38 M
NAWILIWILI HI	22.0 N	159.4 W	2350Z	3.23 FT/1.00 M
HONOLULU HI	21.3 N	157.9 W	2340Z	2.00 FT/0.61 M
SITKA AK	57.1 N	135.3 W	2200Z	0.36 FT/0.11 M
TOFINO BC	49.1 N	125.8 W	2210Z	8.53 FT/2.60 M
SEWARD AK	60.1 N	149.4 W	2216Z	1.97 FT/0.60 M
AKUTAN AK	54.1 N	165.8 W	2256Z	0.52 FT/0.16 M
KING COVE AK	55.1 N	162.3 W	2258Z	3.05 FT/0.93 M
NIKOLSKI AK	52.9 N	168.9 W	2304Z	1.38 FT/0.42 M
PORT ANGELES WA	48.1 N	123.4 W	2305Z	3.61 FT/1.10 M
VALDEZ AK	61.1 N	146.3 W	2315Z	1.18 FT/0.36 M
KODIAK AK	57.8 N	152.4 W	2325Z	2.00 FT/0.61 M
ASTORIA OR	46.2 N	123.8 W	2328Z	4.53 FT/1.38 M
PORT SAN LUIS CA	35.2 N	120.8 W	2345Z	1.94 FT/0.59 M
MONTEREY CA	36.6 N	121.9 W	0000Z	1.15 FT/0.35 M
SANTA BARBARA CA	34.4 N	119.7 W	0000Z	0.59 FT/0.18 M
DUTCH HARBOR AK	53.9 N	166.5 W	0002Z	1.21 FT/0.37 M

LAT - LATITUDE (N-NORTH, S-SOUTH)
 LON - LONGITUDE (E-EAST, W-WEST)
 TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
 AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

EVALUATION

BASED ON ALL AVAILABLE DATA THE TSUNAMI THAT IMPACTED THE STATE OF HAWAII HAS NOW PASSED. THEREFORE THE TSUNAMI WARNING FOR HAWAII IS CANCELLED.

HOWEVER SOME COASTAL AREAS MAY CONTINUE TO EXPERIENCE SEA LEVEL CHANGES AND STRONG OR UNUSUAL CURRENTS LASTING SEVERAL HOURS OR LONGER.

THIS TSUNAMI WARNING CANCELLATION DOES NOT MEAN IT IS NOW SAFE TO RESUME NORMAL ACTIVITIES OR REENTER EVACUATED SHORELINE AREAS. YOUR COUNTY CIVIL DEFENSE AGENCY AND POLICE DEPARTMENT WILL MAKE THIS DETERMINATION. STAY TUNED TO YOUR LOCAL BROADCAST STATION FOR THE CIVIL DEFENSE -ALL CLEAR- ANNOUNCEMENT FOR YOUR AREA. REPEAT - DO NOT REENTER EVACUATED SHORELINE AREAS UNTIL ANNOUNCED BY YOUR COUNTY CIVIL DEFENSE AGENCY. STAY TUNED TO YOUR LOCAL BROADCAST STATION FOR THE -ALL CLEAR- ANNOUNCEMENT FOR YOUR AREA. PLEASE YIELD TO ROADBLOCKS AND UNIFORMED OFFICERS WHO ARE CONTROLLING REENTRY INTO EVACUATED SHORELINE AREAS.

THIS WILL BE THE FINAL BULLETIN ISSUED FOR THIS EVENT UNLESS ADDITIONAL DATA ARE RECEIVED.

\$\$

Appendix E. Web-based WCATWC Products

To: U.S. West Coast, Alaska, and British Columbia coastal regions
From: [NOAA/NWS/West Coast and Alaska Tsunami Warning Center](#)
Subject: [Tsunami Warning and Watch](#) #1 issued 03/23/2011 at 11:06AM PDT

A [Tsunami Warning](#) is now in effect which includes the coastal areas of California, Oregon, Washington, British Columbia and Alaska from the California-Mexico border to Cape Fairweather, Alaska (80 miles SE of Yakutat).

A [Tsunami Watch](#) is now in effect which includes the coastal areas of Alaska from Cape Fairweather, Alaska (80 miles SE of Yakutat) to Attu, Alaska.

A **Tsunami Warning** means that all coastal residents in the [warning area](#) who are near the beach or in low-lying regions should move immediately inland to higher ground and away from all harbors and inlets including those sheltered directly from the sea. Those feeling the earth shake, seeing unusual wave action, or the water level rising or receding may have only a few minutes before the tsunami arrival and should move immediately. Homes and small buildings are not designed to withstand tsunami impacts. Do not stay in these structures.

All residents within the warned area should be alert for instructions broadcast from their local civil authorities. This tsunami warning is based solely on earthquake information - the tsunami has not yet been confirmed.

A **Tsunami Watch** means that all coastal residents in the [watch area](#) should prepare for possible evacuation. A tsunami watch is issued to areas which will not be immediately impacted by the tsunami. Watch areas will either be upgraded to warning or advisory status, or canceled.

At 11:00 AM Pacific Daylight Time on March 23, an [earthquake](#) with preliminary magnitude 9.0 [occurred 95 miles/153 Km west of Eugene, Oregon](#). (Refer to the [United States Geological Survey](#) for official earthquake parameters.) This earthquake **may have** generated a tsunami. If a tsunami has been generated, the waves will first reach Crescent City, California at 11:24 AM PDT on March 23. Estimated [tsunami arrival times](#) and [maps](#) along with [safety rules](#) and [other information](#) can be found on the [WCATWC](#) web site.

[Tsunamis](#) can be dangerous waves that are not survivable. Wave heights are amplified by irregular shoreline and are difficult to forecast. Tsunamis often appear as a strong surge and may be preceded by a receding water level. Mariners in water deeper than 600 feet should not be affected by a tsunami. Wave heights will increase rapidly as water shallows. Tsunamis are a series of ocean waves which can be dangerous for several hours after the initial wave arrival. DO NOT return to evacuated areas until an all clear is given by local civil authorities.

Pacific coastal regions outside California, Oregon, Washington, British Columbia, and Alaska should refer to the [Pacific Tsunami Warning Center](#) messages for information on the event.

This message will be updated in 30 minutes or sooner if the situation warrants. The tsunami message will remain in effect until further notice. For further information stay tuned to NOAA Weather Radio, your local TV or radio stations, or see the [WCATWC](#) web site.

[Link to Standard Warning Message](#)

[Link to Public Warning Message](#)

[Link to XML/CAP Message](#)

[Link to Printable Message](#)

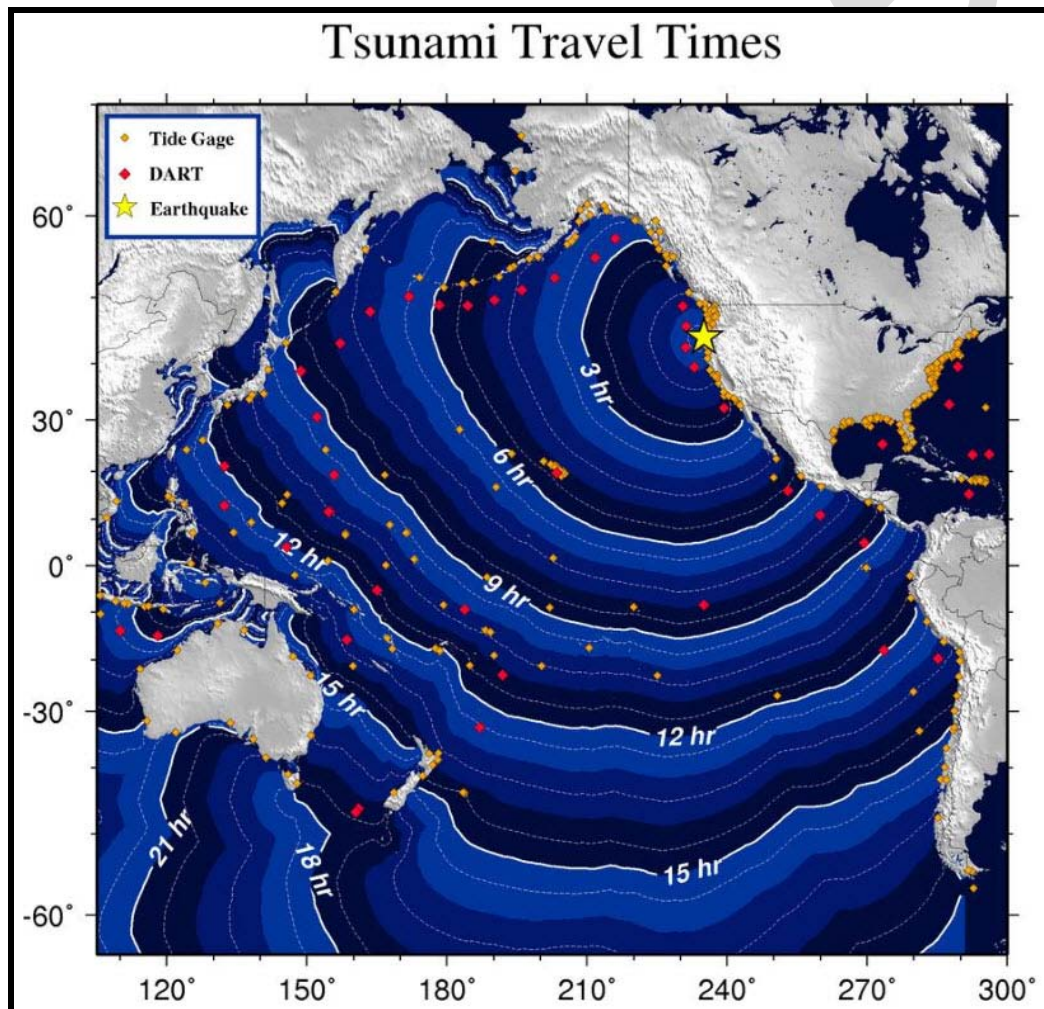


Figure E1: Tsunami Travel Time Map generated after issuing Bulletin 1.

Tsunami travel time list example below.

The following list gives estimated times of arrival for locations along the North American Pacific coast from a tsunami generated at the given source location. The list is ordered by arrival time starting with the earliest. Since tsunami speed is directly related to water depth, tsunami ETAs can be computed independent of tsunami amplitude. THE LISTING OF A TSUNAMI ARRIVAL TIME BELOW DOES NOT INDICATE A WAVE IS IMMINENT. The listed arrival time is the initial wave arrival. Tsunamis can be dangerous for many hours after arrival, and the initial wave is not necessarily the largest.

Source:
 Lat: 44.2N
 Lng: 125.0W
 Mag: 9.0
 O-time: 1800UTC
 Date: MAR 23

Estimated times of initial tsunami arrival:

Crescent City, California	1124	PDT	MAR 23	1824	UTC	MAR 23
the Oregon-California border	1130	PDT	MAR 23	1830	UTC	MAR 23
Douglas/Lane County Line, Oregon (10 miles SW o	1132	PDT	MAR 23	1832	UTC	MAR 23
Cape Mendocino, California	1132	PDT	MAR 23	1832	UTC	MAR 23
DART 46404	1133	PDT	MAR 23	1833	UTC	MAR 23
Charleston, Oregon	1133	PDT	MAR 23	1833	UTC	MAR 23
Humboldt Bay, California	1133	PDT	MAR 23	1833	UTC	MAR 23
DART 46407	1136	PDT	MAR 23	1836	UTC	MAR 23
DART 46411	1136	PDT	MAR 23	1836	UTC	MAR 23
Cape Blanco, Oregon	1137	PDT	MAR 23	1837	UTC	MAR 23
Clatsop Spit, Oregon	1138	PDT	MAR 23	1838	UTC	MAR 23
the Oregon-Washington border	1138	PDT	MAR 23	1838	UTC	MAR 23
Horse Mountain, California (50 miles SW of Eure	1140	PDT	MAR 23	1840	UTC	MAR 23
La Push, Washington	1141	PDT	MAR 23	1841	UTC	MAR 23
Cascade Head, Oregon (70 miles SW of Portland)	1141	PDT	MAR 23	1841	UTC	MAR 23
Newport, Oregon	1142	PDT	MAR 23	1842	UTC	MAR 23
DART 46419	1144	PDT	MAR 23	1844	UTC	MAR 23
Point Grenville, Washington	1144	PDT	MAR 23	1844	UTC	MAR 23
the Washington-British Columbia border	1147	PDT	MAR 23	1847	UTC	MAR 23
Fort Bragg, California	1148	PDT	MAR 23	1848	UTC	MAR 23
Westport, Washington	1149	PDT	MAR 23	1849	UTC	MAR 23
Tillamook Bay, Oregon	1150	PDT	MAR 23	1850	UTC	MAR 23
Seaside, Oregon	1150	PDT	MAR 23	1850	UTC	MAR 23
Neah Bay, Washington	1153	PDT	MAR 23	1853	UTC	MAR 23
Point Arena, California	1157	PDT	MAR 23	1857	UTC	MAR 23
Gualala Point, California (80 miles NW of San F	1159	PDT	MAR 23	1859	UTC	MAR 23
Tofino, British Columbia	1208	PDT	MAR 23	1908	UTC	MAR 23
Astoria, Oregon	1210	PDT	MAR 23	1910	UTC	MAR 23
the north tip of Vancouver Island, British Colu	1213	PDT	MAR 23	1913	UTC	MAR 23
Point Reyes, California	1215	PDT	MAR 23	1915	UTC	MAR 23
Davenport, California (10 miles NW of Santa Cru	1220	PDT	MAR 23	1920	UTC	MAR 23
Point Sur, California	1223	PDT	MAR 23	1923	UTC	MAR 23
Monterey, California	1226	PDT	MAR 23	1926	UTC	MAR 23
Port Angeles, Washington	1231	PDT	MAR 23	1931	UTC	MAR 23
Ragged Point, California (45 miles NW of San Lu	1234	PDT	MAR 23	1934	UTC	MAR 23
San Francisco, California	1245	PDT	MAR 23	1945	UTC	MAR 23
Point Concepcion, California	1248	PDT	MAR 23	1948	UTC	MAR 23
DART 46412	1249	PDT	MAR 23	1949	UTC	MAR 23
Port San Luis, California	1252	PDT	MAR 23	1952	UTC	MAR 23
the Alaska/British Columbia border	1305	PDT	MAR 23	2005	UTC	MAR 23
Langara Island, British Columbia	1307	PDT	MAR 23	2007	UTC	MAR 23
Santa Barbara, California	1308	PDT	MAR 23	2008	UTC	MAR 23
Rincon Point, California (15 miles SE of Santa	1319	PDT	MAR 23	2019	UTC	MAR 23
San Pedro, California	1324	PDT	MAR 23	2024	UTC	MAR 23
Santa Monica, California	1324	PDT	MAR 23	2024	UTC	MAR 23
Seattle, Washington	1326	PDT	MAR 23	2026	UTC	MAR 23
Newport Beach, California	1331	PDT	MAR 23	2031	UTC	MAR 23
Port Alexander, Alaska	1235	AKDT	MAR 23	2035	UTC	MAR 23
La Jolla, California	1338	PDT	MAR 23	2038	UTC	MAR 23
Alamitos Bay, California (20 miles SE of L.A.)	1340	PDT	MAR 23	2040	UTC	MAR 23
the California-Mexico border	1344	PDT	MAR 23	2044	UTC	MAR 23
DART 46410	1250	AKDT	MAR 23	2050	UTC	MAR 23
Sitka, Alaska	1250	AKDT	MAR 23	2050	UTC	MAR 23

DART 46409	1255 AKDT MAR 23	2055 UTC MAR 23
Cape Decision, Alaska (85 miles SE of Sitka)	1255 AKDT MAR 23	2055 UTC MAR 23
Salisbury Sound, Alaska (25 miles NW of Sitka)	1259 AKDT MAR 23	2059 UTC MAR 23
Elfin Cove, Alaska	1301 AKDT MAR 23	2101 UTC MAR 23
Ketchikan, Alaska	1305 AKDT MAR 23	2105 UTC MAR 23
Craig, Alaska	1318 AKDT MAR 23	2118 UTC MAR 23
Cape Fairweather, Alaska (80 miles SE of Yakuta)	1321 AKDT MAR 23	2121 UTC MAR 23
Bella Bella, British Columbia	1426 PDT MAR 23	2126 UTC MAR 23
DART 46403	1331 AKDT MAR 23	2131 UTC MAR 23
Cape Suckling, Alaska (75 miles SE of Cordova)	1332 AKDT MAR 23	2132 UTC MAR 23
Prince Rupert, British Columbia	1436 PDT MAR 23	2136 UTC MAR 23
Yakutat, Alaska	1345 AKDT MAR 23	2145 UTC MAR 23
Juneau, Alaska	1355 AKDT MAR 23	2155 UTC MAR 23
Hinchinbrook Entrance, Alaska (90 miles E of Se	1358 AKDT MAR 23	2158 UTC MAR 23
DART 46402	1407 AKDT MAR 23	2207 UTC MAR 23
Seward, Alaska	1416 AKDT MAR 23	2216 UTC MAR 23
Kodiak, Alaska	1417 AKDT MAR 23	2217 UTC MAR 23
Valdez, Alaska	1432 AKDT MAR 23	2232 UTC MAR 23
Old Harbor, Alaska	1433 AKDT MAR 23	2233 UTC MAR 23
Kennedy Entrance, Alaska (40 miles SW of Homer)	1435 AKDT MAR 23	2235 UTC MAR 23
DART 46408	1437 AKDT MAR 23	2237 UTC MAR 23
Cordova, Alaska	1441 AKDT MAR 23	2241 UTC MAR 23
Sand Point, Alaska	1450 AKDT MAR 23	2250 UTC MAR 23
Perryville, Alaska	1452 AKDT MAR 23	2252 UTC MAR 23
Akutan, Alaska	1456 AKDT MAR 23	2256 UTC MAR 23
King Cove, Alaska	1458 AKDT MAR 23	2258 UTC MAR 23
Unimak Pass, Alaska (80 miles NE of Dutch Harbo	1459 AKDT MAR 23	2259 UTC MAR 23
DART 46413	1500 AKDT MAR 23	2300 UTC MAR 23
Chignik Bay, Alaska	1503 AKDT MAR 23	2303 UTC MAR 23
Nikolski, Alaska	1504 AKDT MAR 23	2304 UTC MAR 23
Alitak, Alaska	1507 AKDT MAR 23	2307 UTC MAR 23
Dutch Harbor, Alaska	1510 AKDT MAR 23	2310 UTC MAR 23
Atka, Alaska	1513 AKDT MAR 23	2313 UTC MAR 23
Homer, Alaska	1523 AKDT MAR 23	2323 UTC MAR 23
Amchitka Pass, Alaska (125 miles W of Adak)	1525 AKDT MAR 23	2325 UTC MAR 23
Cold Bay, Alaska	1533 AKDT MAR 23	2333 UTC MAR 23
Adak, Alaska	1535 AKDT MAR 23	2335 UTC MAR 23
DART 21414	1535 AKDT MAR 23	2335 UTC MAR 23
Amchitka, Alaska	1536 AKDT MAR 23	2336 UTC MAR 23
DART 21415	1602 AKDT MAR 23	0002 UTC MAR 24
Shemya, Alaska	1618 AKDT MAR 23	0018 UTC MAR 24
Attu, Alaska	1624 AKDT MAR 23	0024 UTC MAR 24
St. Paul, Alaska	1631 AKDT MAR 23	0031 UTC MAR 24
Port Moller, Alaska	1826 AKDT MAR 23	0226 UTC MAR 24
Saint Matthew Island, Alaska	1910 AKDT MAR 23	0310 UTC MAR 24
Cape Newenham, Alaska	2000 AKDT MAR 23	0400 UTC MAR 24
Gambell, Alaska	2130 AKDT MAR 23	0530 UTC MAR 24
Dillingham, Alaska	2150 AKDT MAR 23	0550 UTC MAR 24
Hooper Bay, Alaska	2324 AKDT MAR 23	0724 UTC MAR 24
Little Diomed Island, Alaska	0027 AKDT MAR 24	0827 UTC MAR 24
Nome, Alaska	0222 AKDT MAR 24	1022 UTC MAR 24
Unalakleet, Alaska	0511 AKDT MAR 24	1311 UTC MAR 24

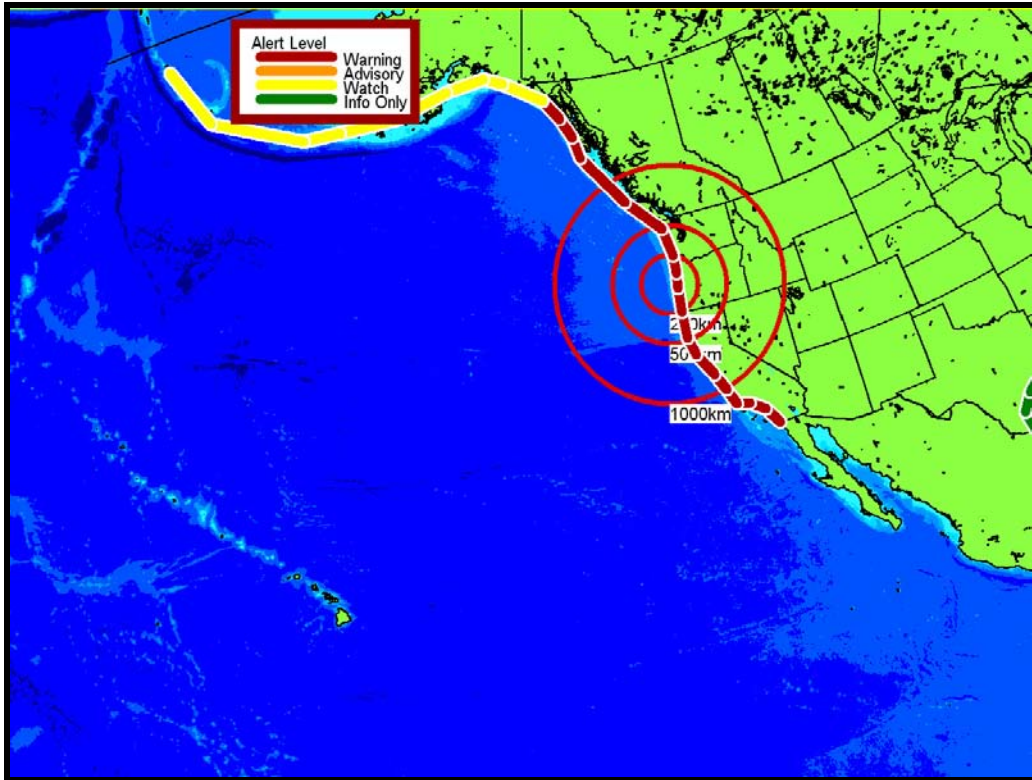


Figure E2: Small-scale map issued with Bulletin 1.

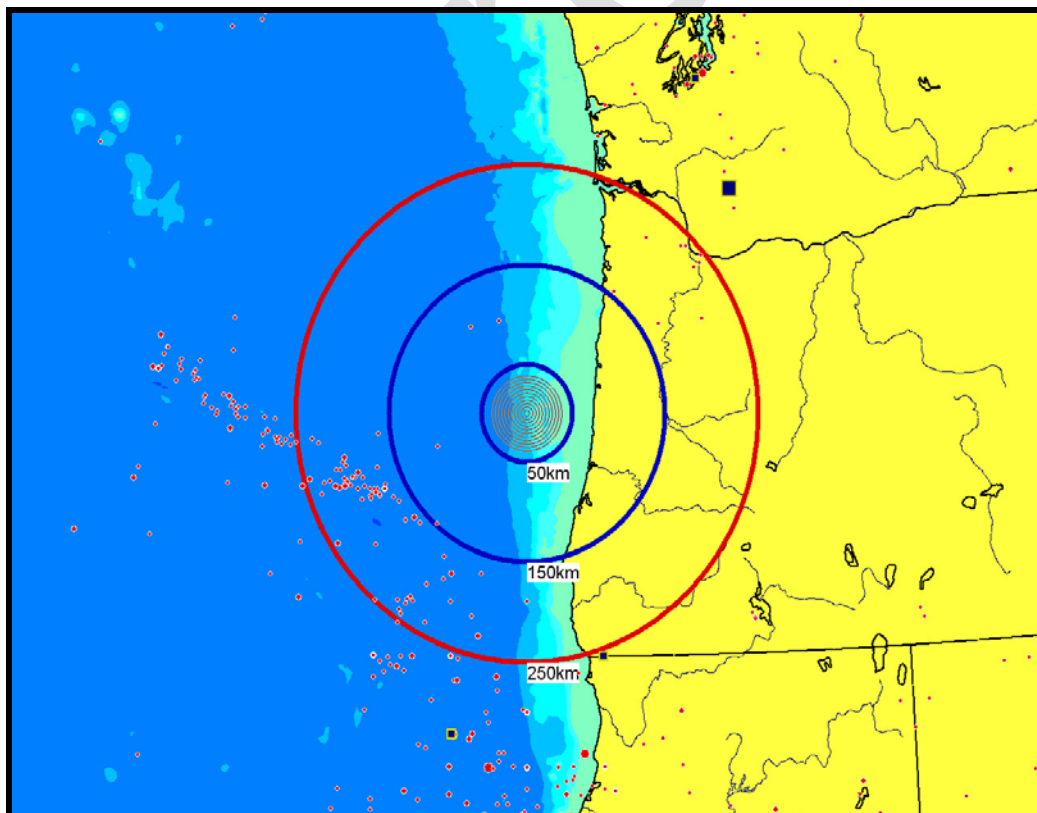


Figure E3: Large-scale map issued with Bulletin 1.

Appendix F. Sample Press Release for Local Media

TEMPLATE FOR NEWS RELEASE

USE AGENCY MASTHEAD

Contact: (insert name)
(insert phone number)
(insert email address)

FOR IMMEDIATE RELEASE
(insert date)

NORTH PACIFIC TSUNAMI EXERCISE TO BE CONDUCTED MARCH 23, 2011

(insert community/county/state name) will join other localities in the north Pacific as a participant in a tsunami response exercise on March 23, 2011. The purpose of this exercise is to evaluate local tsunami response plans, increase tsunami preparedness, and improve coordination throughout the region.

(insert a promotional comment from a local official, such as "The 2009 Samoa earthquake and tsunami reminded world again of the urgent need to be more prepared for such events," said (insert name of appropriate official). "This important exercise will test the current procedures of the Tsunami Warning System and help identify operational strengths and weaknesses in each community." (Please modify for uniqueness.)

The exercise, titled PACIFEX 11, will simulate a widespread Tsunami Warning, Watch, and Advisory situation along U.S. and Canadian west coasts requiring implementation of local tsunami response plans. It is the second such exercise including all Pacific states, provinces, territories, and commonwealths. The exercise will *(insert "include" or "not include")* public notification.

The exercise will simulate a major earthquake and tsunami generated 95 miles west of Eugene, OR at 11:00 am Pacific Daylight Time *(or appropriate local time)* on March 23, 2011. Exercise participants will be provided with a handbook which describes the scenario and contains tsunami messages from both the West Coast/Alaska Tsunami Warning Center (WCATWC) and the Pacific Tsunami Warning Center (PTWC). .

Insert paragraph tailored for specific community. Could identify participating agencies and specific plans. Could describe current early warning program, past tsunami exercises (if any), ongoing mitigation and public education programs, etc. Could describe tsunami threat, history of tsunami hazards, if any.

If any real tsunami threat occurs during the time period of the exercise, the exercise will be terminated.

The exercise is sponsored by the U.S. National Oceanic and Atmospheric Administration (NOAA) and by the U.S. National Tsunami Hazard Mitigation Program (NTHMP – a partnership of 28 states and territories and three federal agencies). For more information on the U.S. tsunami warning system, see www.tsunami.gov. For more information on the NTHMP, see nthmp.tsunami.gov.

###

On the Web:

West Coast/Alaska Tsunami Warning Center

<http://wcatwc.arh.noaa.gov>

Pacific Tsunami Warning Center

<http://www.weather.gov/ptwc>

NOAA Tsunami Program

<http://www.tsunami.gov>

NTHMP:

<http://nthmp.tsunami.gov>

Insert state/local emergency response URLs

Exercise