

# Exercise

# PACIFEX 13

## Participant Handbook

A Pacific tsunami warning exercise:  
March 27, 2013

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 PACIFEX12 handbook.

Exercise

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# 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 PACIFEX13 exercise simulates a tsunami generated by a major earthquake located in the Mariana Trench subduction zone near the island of Guam in the Western Pacific.

The **Mariana Trench** or **Marianas Trench** is the deepest part of the world's oceans. It is located in the western Pacific Ocean, to the east of the Mariana Islands. The trench is about 2,550 kilometers (1,580 mi) long but has a mean width of only 69 kilometers (43 mi). It reaches a maximum-known depth of 10.994 km (10,994 ± 40 m) or 6.83 mi (36,069 ± 131 ft) at the Challenger Deep, a small slot-shaped valley in its floor, at its southern end, although some unrepeatable measurements place the deepest portion at 11.03 kilometers (6.85 mi).

At the bottom of the trench the water column above exerts a pressure of 1,086 bars (15,750 psi), over one thousand times the standard atmospheric pressure at sea level. At this pressure the density of water is increased by 4.96%, making ninety-five liters of water under the pressure of the Challenger Deep contain the same mass as a hundred liters at the surface.

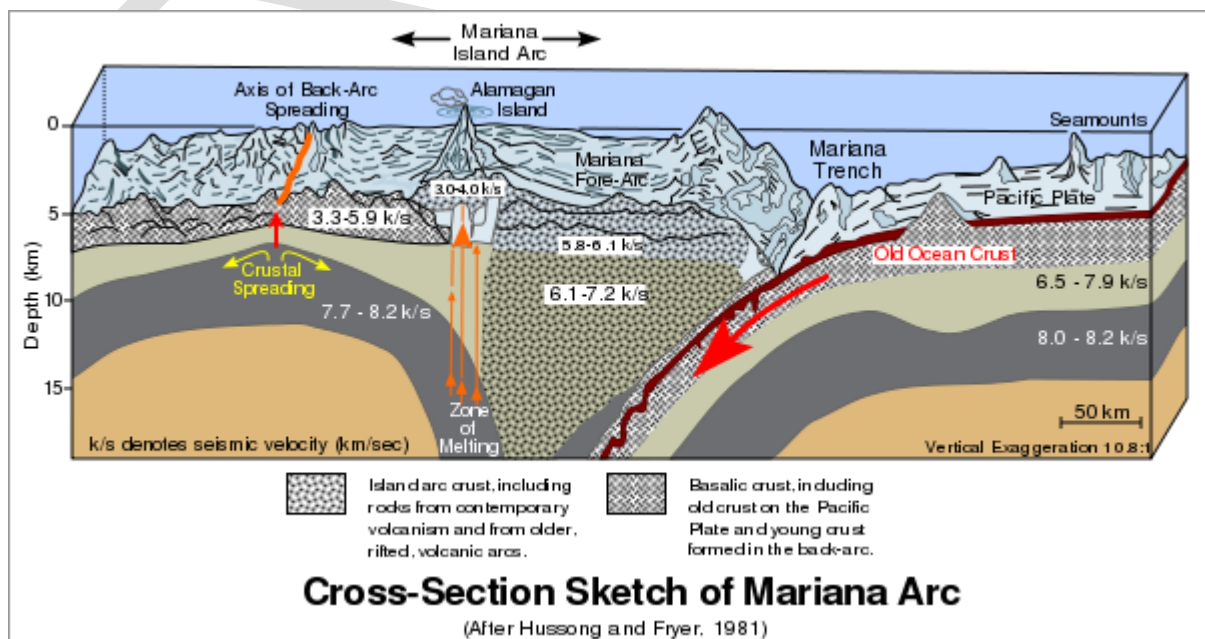


Figure 1a. Cross section of Mariana Arc subduction zone.

The Mariana Trench is part of the [Izu-Bonin-Mariana Arc](#) geological boundary system that forms the boundary between two [tectonic plates](#). In this system, the western edge of one plate, the [Pacific Plate](#), is [subducted](#) beneath the smaller [Mariana Plate](#) that lies to the west. Because the Pacific plate is the largest of all the tectonic plates on Earth, crustal material at its western edge has had a long time since formation (up to 170 million years) to compact and become very dense; hence its great height-difference relative to the higher-riding Mariana Plate, at the point where the Pacific Plate crust is subducted. This deep area is the Mariana Trench proper. The movement of these plates is also indirectly responsible for the formation of the [Mariana Islands](#) (which are caused by volcanism as a result of subduction).

Contributing articles and sources for the above summary can be found at [http://en.wikipedia.org/wiki/Mariana\\_Trench](http://en.wikipedia.org/wiki/Mariana_Trench).



Figure 1b. Mariana Trench.

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 near the Marianas Trench. 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 13.

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 weeks	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	1-2	1-5 days	Multiple Agency participation

Exercise	months		
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 8.3 earthquake located in the Mariana Islands Region at 20.2°N, 146.8°E. It increases to magnitude 9.0 by the third message. The earthquake occurs at 1800 UTC on March 27, 2013, though participants can exercise the scenario at any time and compress the timeline as necessary. The tsunami generated by this earthquake significantly impacts many areas near the source and later impacts other U.S. and Canadian coasts in the Pacific. The scenario is further described 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 27, 2013. 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 14-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. One is known as the segmented message. This message is segmented and includes encoded NWS zones and their level of threat. The segmentation is used for automated processing systems which parse NWS products. The other products are known as public messages, and are provided in Appendix D. This message has no segmentation and is written in an easier-to-read format. EMOs generally use the public product for warning response as it has more complete information. Graphical products are also issued to the 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. EMOs are welcome to modify the timeline and/or wave amplitudes to suit their exercise – for example, to compress the timeline and use larger amplitudes. 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 20.2°N, 146.8°E occurring on March 27, 2013 at 1800 UTC.

Date (UTC)	Time (UTC)	WCATWC Message			PTWC Pacific Product			PTWC Hawaii Product		
		#	Type	Dummy	#	Type	Dummy	#	Type	Dummy
03/27/2013		----- Earthquake occurs -----								
03/27/2013	1807	01	WWA	Yes	01	EWW	No	01	WCH	Yes
03/27/2013	1902	02	WWA	No	02	EWW	No	02	WCH	No
03/27/2013	2006	03	WWA	No	03	EWW	No	03	WCH	No
03/27/2013	2104	04	WWA	No	04	PWW	No	04	WRN	No
03/27/2013	2202	05	WWA	No	05	PWW	No	05	WRN	No
03/28/2013	2302	06	WWA	No	06	PWW	No	06	WRN	No
03/28/2013	0002	07	WWA	No	07	PWW	No	07	WRN	No
03/28/2013	0103	08	WWA	No	08	PWW	No	08	WRN	No
03/28/2013	0202	09	WWA	No	09	PWW	No	09	WRN	No
03/28/2013	0302	10	WWA	No	10	PWW	No	10	ADV	No
03/28/2013	0401	11	WWA	No	11	PWW	No	11	ADV	No
03/28/2013	0502	12	WWA	No	12	PWW	No	12	ADV	No
03/28/2013	0602	13	WWA	No	13	PWW	No	13	ADV	No
03/28/2013	0702	14	WWA	No	14	PWW	No	14	ADV	No
03/28/2013	0802	15	Can	No	15	Can	No	15	Can	No

**WCATWC Message Types:**

- WWA Warning/Watch/Advisory
- Can WWA Cancellation

**PTWC Pacific Message Types:**

- EWW Expanding Warning/Watch
- PWW Pacific-wide Warning
- Can Warning Cancellation

**PTWC Hawaii Message Types:**

- WCH Tsunami Watch
- WRN Tsunami Warning
- ADV Tsunami Advisory
- Can Advisory 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	WEAK51 PAAQ	TSUAK1	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 13**” 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:

- |                |                      |              |  |
|----------------|----------------------|--------------|--|
| Kevin Miller   | CA EMA, Tsunami PM   | 626-356-3810 | <a href="mailto:kevin.miller@calema.ca.gov">kevin.miller@calema.ca.gov</a> |
| Althea Turner  | OR OEM Tsunami PM    | 503-378-2911 | <a href="mailto:Althea.Rizzo@state.or.us">Althea.Rizzo@state.or.us</a>     |
| John Schelling | WA EMD Tsunami PM    | 253-512-7084 | <a href="mailto:j.schelling@emd.wa.gov">j.schelling@emd.wa.gov</a>         |
| Teron Moore    | BC PEP Tsunami PM    | 250-952-4989 | <a href="mailto:teron.moore@gov.bc.ca">teron.moore@gov.bc.ca</a>           |
| Erv Petty      | AK DHS&EM Tsunami PM | 907-428-7015 | <a href="mailto:ervin.petty@alaska.gov">ervin.petty@alaska.gov</a>         |
| Kevin Richards | HI CD Tsunami PM     | 808-733-4301 | <a href="mailto:krichards@scd.hawaii.gov">krichards@scd.hawaii.gov</a>     |
| Paul Whitmore  | WCATWC Director      | 907-745-4212 | <a href="mailto:paul.whitmore@noaa.gov">paul.whitmore@noaa.gov</a>         |
| Paul Huang     | WCATWC TWSO          | 907-745-4212 | <a href="mailto:paul.huang@noaa.gov">paul.huang@noaa.gov</a>               |

James Waddell	WCATWC Exercise Rep.	907-745-4212	<a href="mailto:james.waddell@noaa.gov">james.waddell@noaa.gov</a>
Chip McCreery	PTWC Director	808-689-8207	<a href="mailto:charles.mccreery@noaa.gov">charles.mccreery@noaa.gov</a>
Stuart Weinstein	PTWC TWSO	808-689-8207	<a href="mailto:stuart.weinstein@noaa.gov">stuart.weinstein@noaa.gov</a>
Gerard Fryer	PTWC Exercise Rep.	808-689-8207	<a href="mailto:gerard.fryer@noaa.gov">gerard.fryer@noaa.gov</a>

### 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.

Exercise

## 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 located in the Mariana Islands Region at 20.2N, 146.8E. Other fault parameters are:

Length: 650km  
 Width: 200km  
 Depth: 5km  
 Strike: 179°  
 Dip: 18°  
 Slip: 90°  
 Moment:  $4.0 \times 10^{29}$  dyne-cm

The fault was not angled and it ruptured simultaneously across the full rupture.

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.**

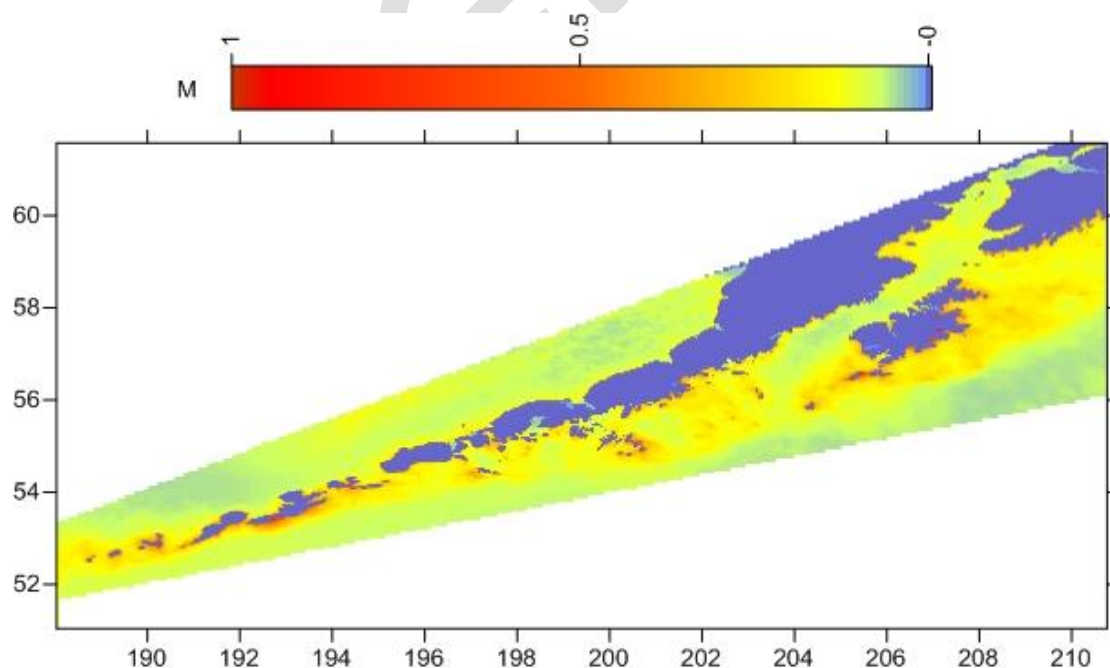


Figure B1: Maximum modeled tsunami amplitudes along the Alaska Peninsula, Alaska (longitudes are east longitude).



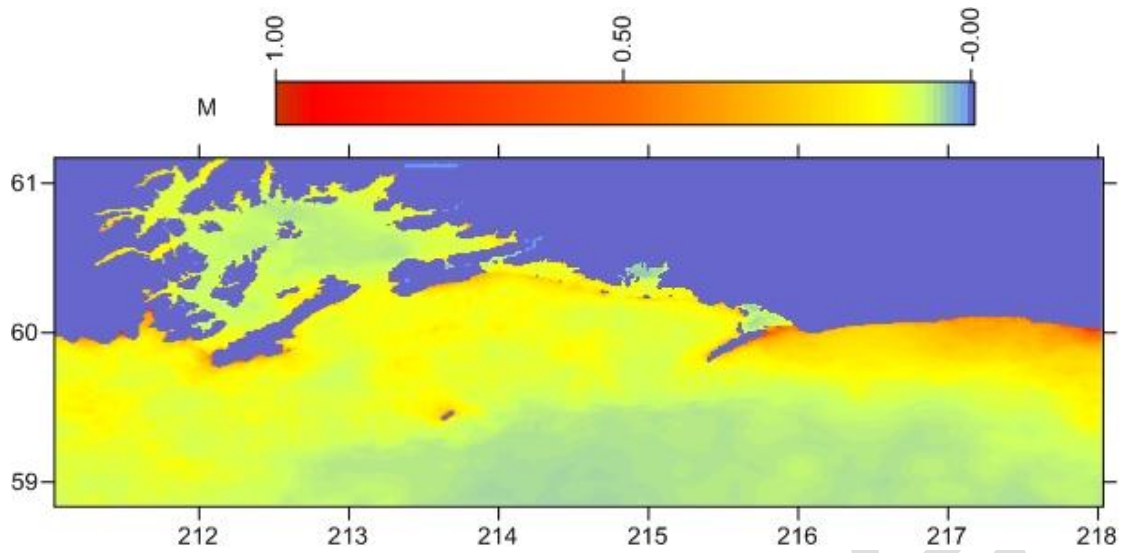


Figure B2. Maximum modeled tsunami amplitudes near Prince William Sound, Alaska (longitudes are east longitude).

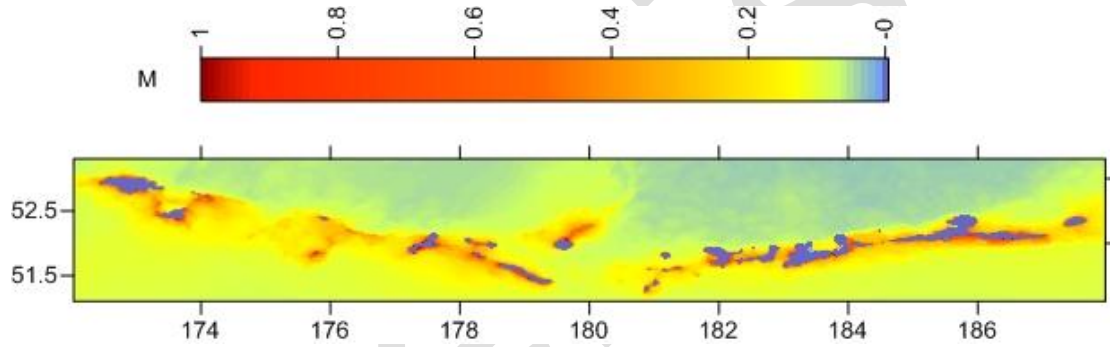
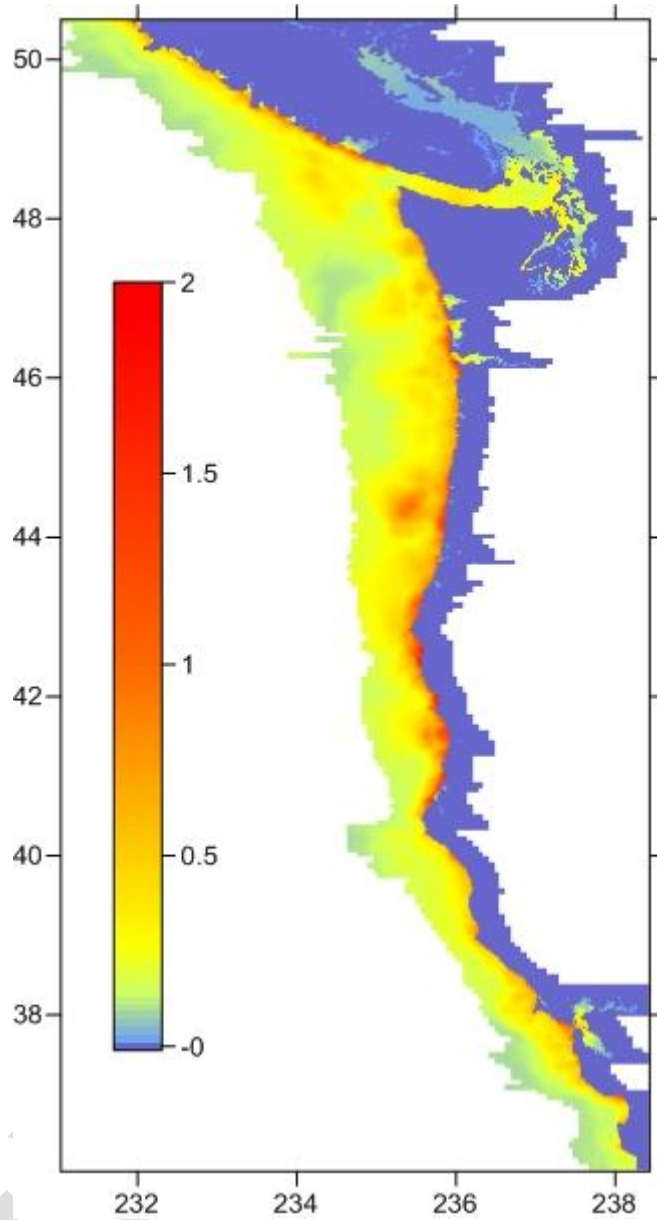


Figure B3. Maximum modeled tsunami amplitudes throughout the Aleutian Islands (longitudes are east longitude).



**Figure B4. Maximum modeled tsunami amplitudes in British Columbia, Washington, Oregon, and northern California (longitudes are east longitude).**

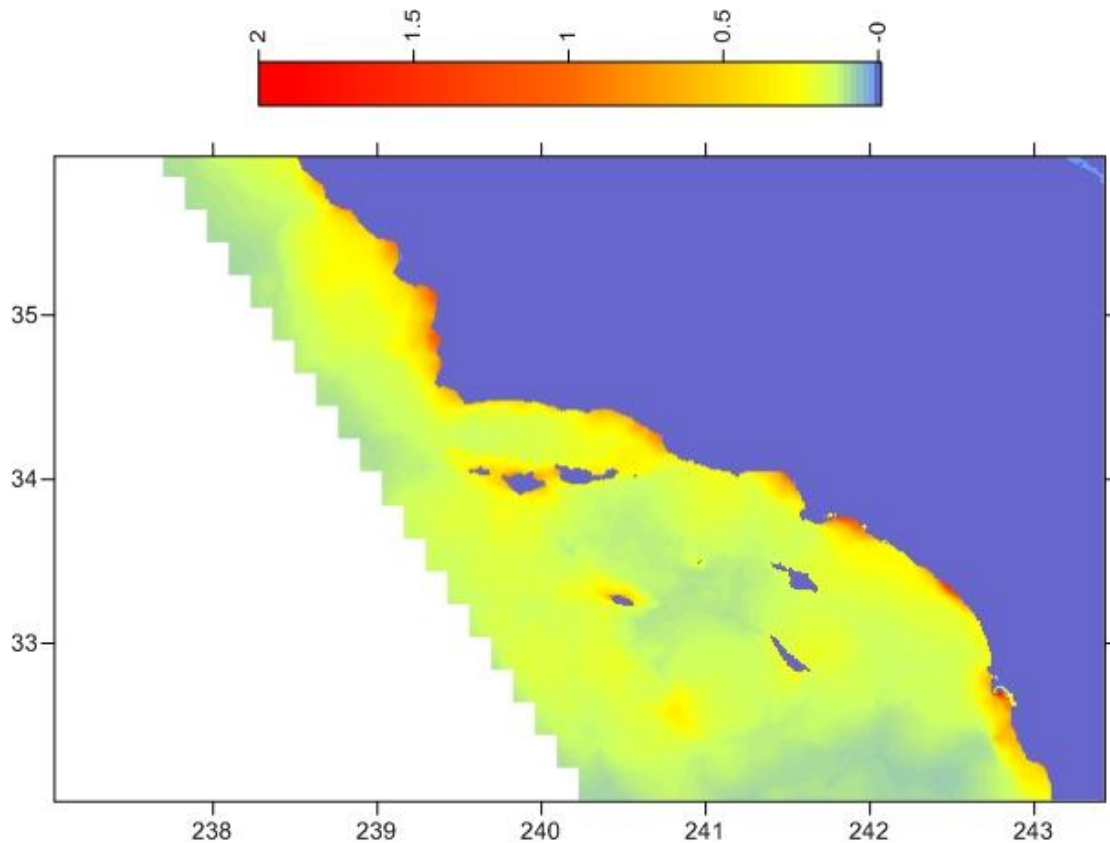


Figure B5. Maximum modeled tsunami amplitudes in southern California (longitudes are east longitude).

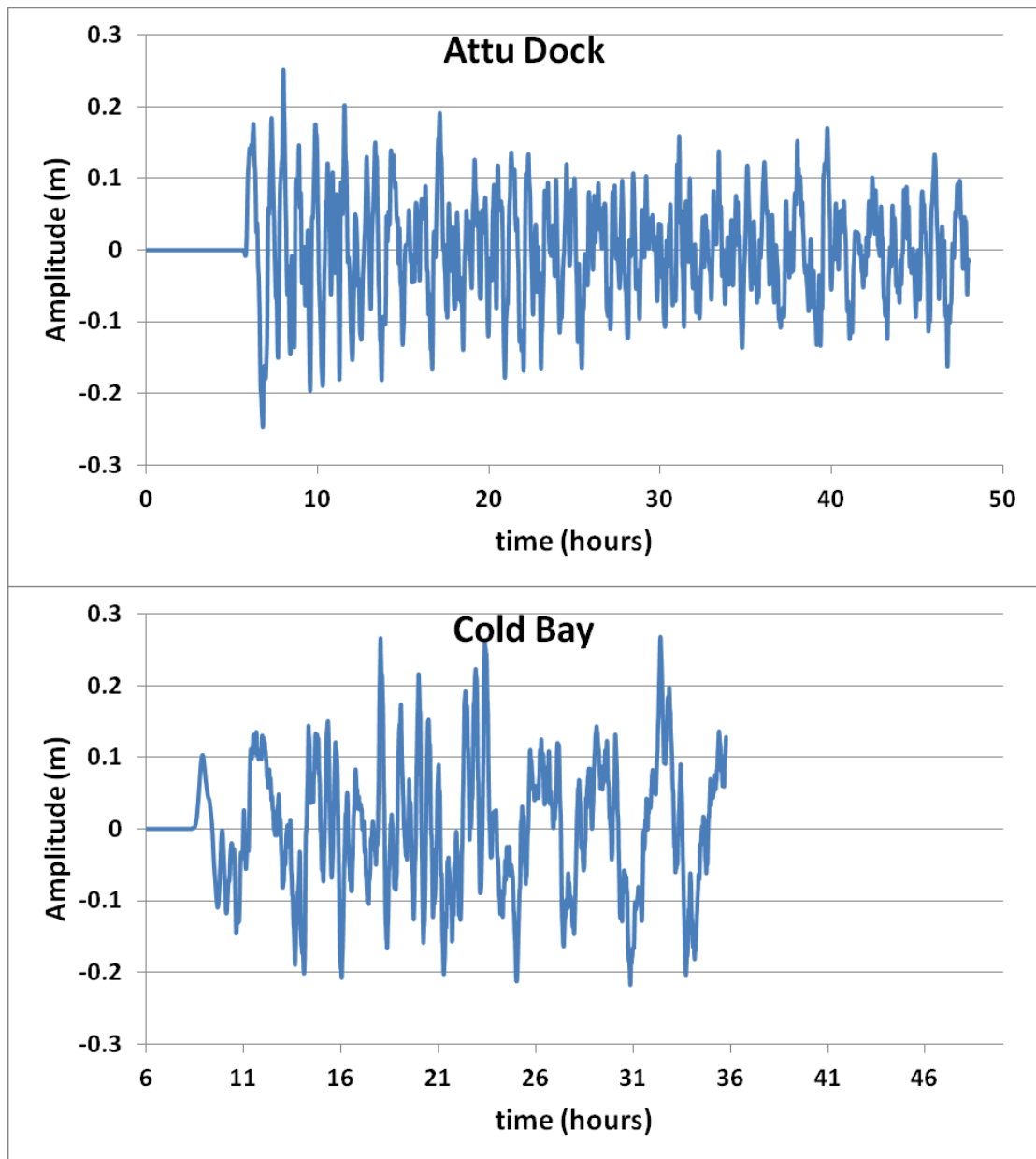
The following table provides maximum modeled amplitudes at many points throughout the exercise area. Amplitude indicates the level of the tsunami above normal sea level at the coast. Coastal amplitudes may induce vertical runups along shore that exceed the forecast amplitude by double or more due to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

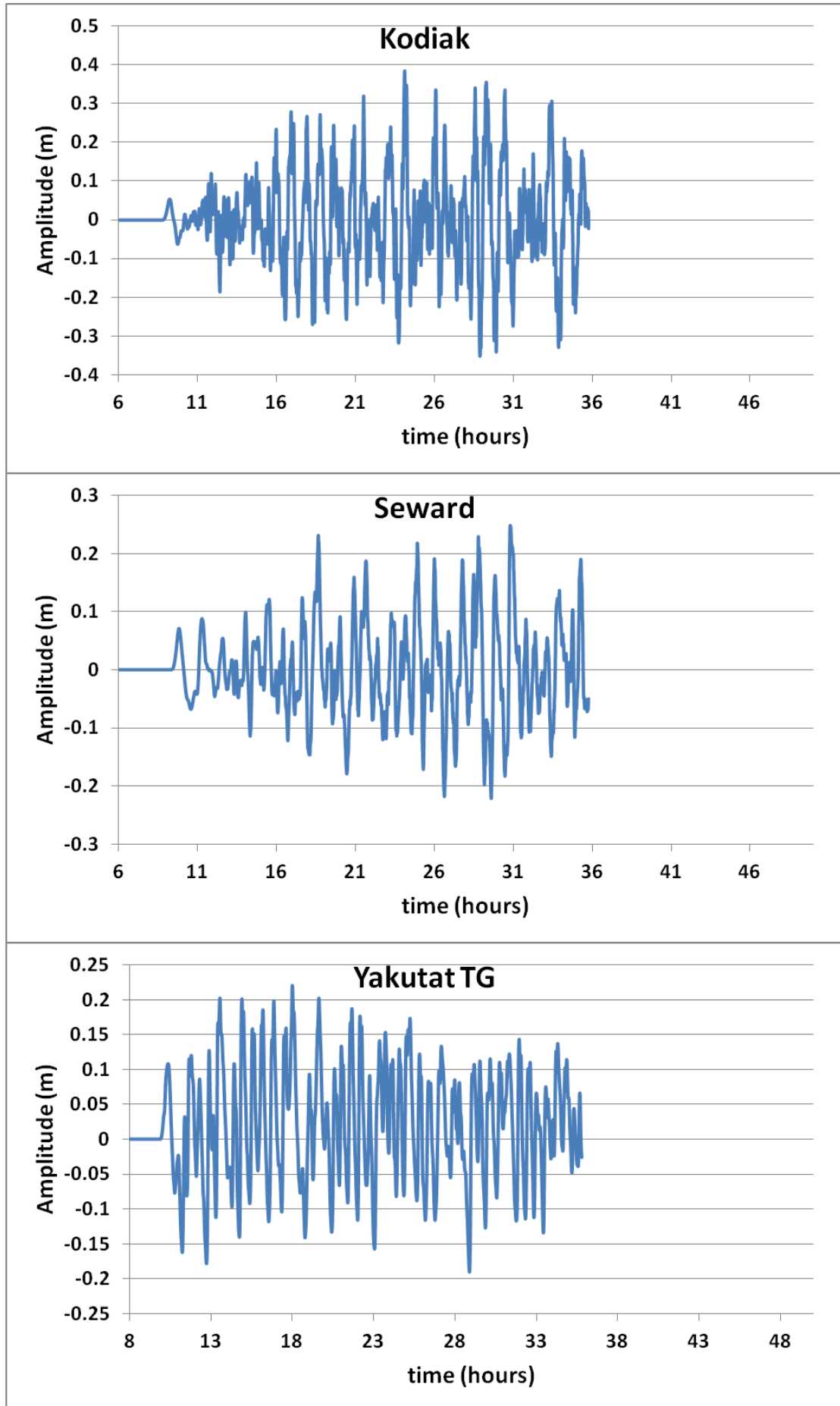
Location	Amplitude (m)	Location	Amplitude (m)
Attu, AK	0.95	Necanium R. Mouth, OR	1.28
Karab Cove, AK	0.52	Cannon Beach, OR	1.25
Alaid I., AK	0.60	Manzanita, OR	0.79
Nizki I., AK	1.12	Rockaway Beach, OR	1.03
Shemya, AK	0.70	Bayocean Peninsula, OR	0.82
False Bay, AK	0.84	Netarts, OR	1.30
Adak Dock, AK	0.58	Nestucca Bay, OR	1.06
Agony Point, AK	0.42	Neskowin, OR	1.20
West Atka I., AK	0.56	Siletz Bay, OR	2.18
Samalga I., AK	0.51	Depoe Bay, OR	0.90
St. Paul, AK	0.20	Newport, OR	0.83
Nikolski, AK	0.59	Yaquina John Point, OR	0.84
Unalaska, AK	0.42	Yachats, OR	1.09
Sedanka I., AK	0.50	Siuslaw River Mouth, OR	1.16
Akutan, AK	0.45	Umpqua River Mouth, OR	1.40
Avatanak I., AK	0.66	Empire, OR	0.35
False Pass, AK	0.11	Coos Bay, OR	0.16
Sanak, AK	0.31	Charleston, OR	0.49

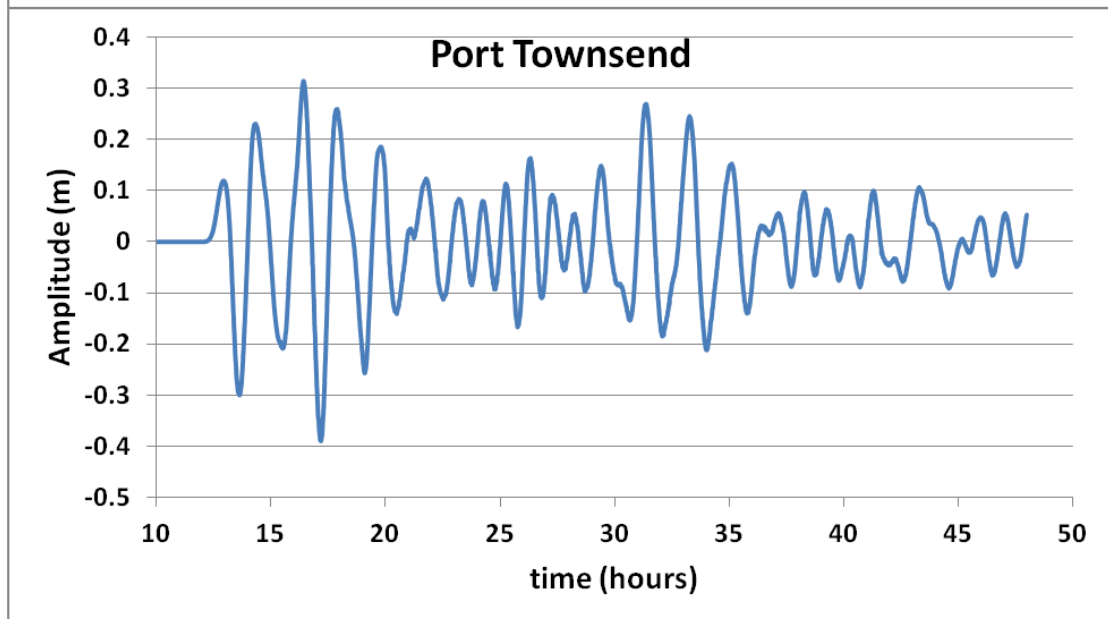
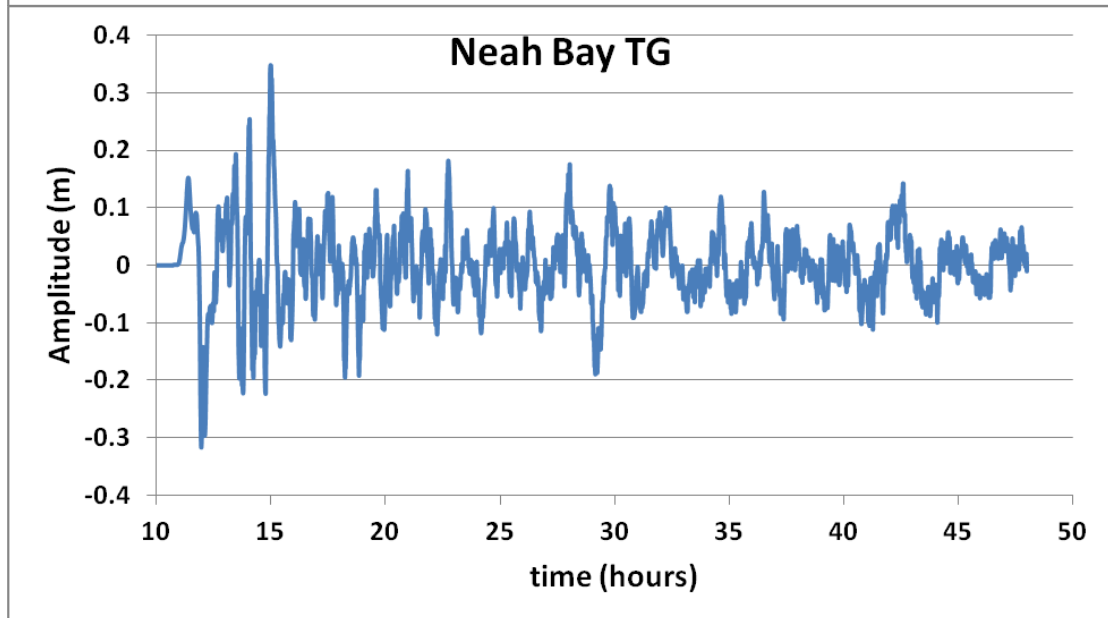
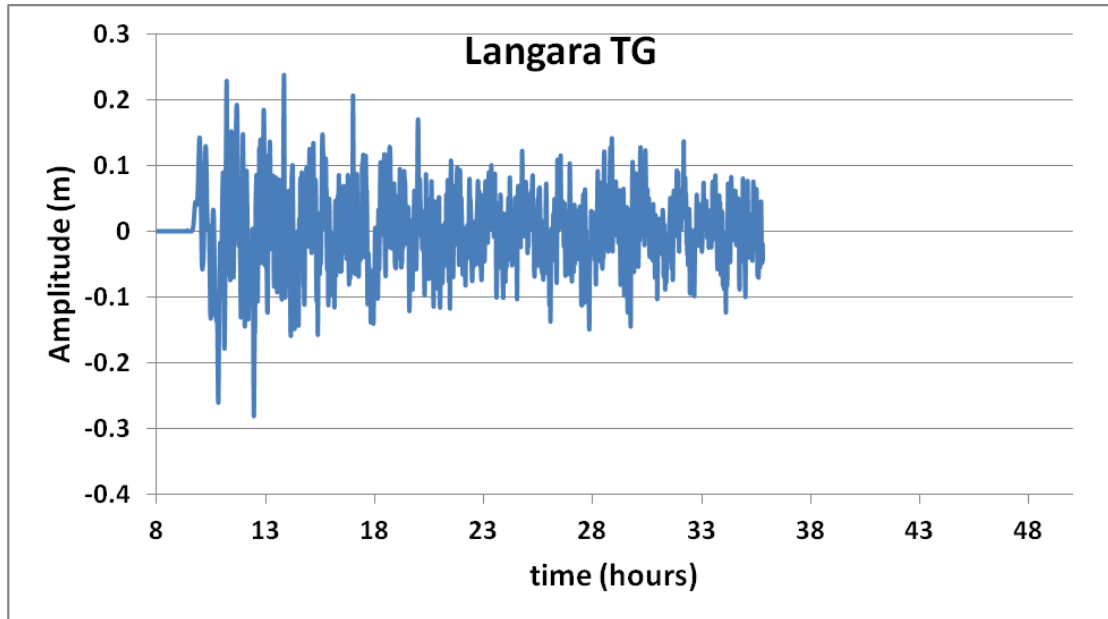
Cold Bay, AK	0.24	Port Orford, OR	1.52
King Cove, AK	0.31	Brookings, OR	1.37
Belkofski, AK	0.34	Crescent City TG, CA	1.85
Sand Pt., AK	0.29	Klamath River Mouth, CA	2.17
Ivanof Bay, AK	0.23	Trinidad, CA	1.68
Perryville, AK	0.17	Humboldt Bay, CA	0.97
Gull Point, AK	0.18	Eureka, CA	0.47
Kodiak, AK	0.29	South Spit, CA	1.15
Port Lions, AK	0.14	Ten Mile River, CA	0.99
Ouzinki, AK	0.14	Mendocino, CA	0.60
Selezen Pt., AK	0.11	Elk, CA	0.91
English Bay, AK	0.03	Arena Cove, CA	0.83
Seldovia, AK	0.05	Bodega Bay, CA	0.88
Homer Spit, AK	0.04	Point Reyes Beach, CA	0.71
Halibut Cove, AK	0.03	Fort Point, CA	0.58
Seward, AK	0.11	Sausalito, CA	0.40
Whittier, AK	0.05	Alameda, CA	0.27
Montague I., AK	0.11	Pacifica, CA	0.83
Cape Hinchinbrook, AK	0.09	Half Moon Bay, CA	1.31
Tatitlek, AK	0.07	Rio Del Mar, CA	1.71
Valdez, AK	0.07	Santa Cruz, CA	1.57
Cordova, AK	0.06	Moss Landing, CA	0.41
Icy Bay, AK	0.39	Monterey, CA	0.54
Schooner Beach, AK	0.30	Carmel, CA	0.27
Yakutat dock, AK	0.46	Point Sur, CA	0.70
Situk River Mouth, AK	0.78	Morro Bay, CA	1.02
Gustavus, AK	0.21	Pt. San Luis, CA	0.68
Auke Bay, AK	0.16	Pismo Beach, CA	1.14
Hoonah, AK	0.18	Lions Head, CA	0.95
Elfin Cove, AK	0.34	Surf, CA	0.86
Cape Bingham, AK	0.16	Gaviota, CA	0.30
Kruzof I., AK	0.91	Naples, CA	0.26
Krestof I., AK	0.79	Santa Barbara, CA	0.33
Sitka Dock, AK	1.12	Carpinteria, CA	0.69
Povorotni Point, AK	0.91	Santa Cruz I., CA	0.23
Biorka I, AK	0.88	Vantura, CA	1.10
Langara, BC	0.22	Malibu, CA	0.64
White Point, BC	0.69	Santa Monica, CA	1.34
Cape Scott, BC	0.48	Redondo Beach, CA	0.45
Matlahaw Point, BC	0.60	LA, CA	0.43
Tofino, BC	0.84	Middle Harbor, CA	1.01
Neah Bay, WA	0.35	Seal Beach, CA	1.01
Port Angeles, WA	0.19	Huntington Beach, CA	1.15
Bellingham, WA	0.15	Laguna Beach, CA	0.33
Everett, WA	0.06	Oceanside, CA	0.68
Seattle – Pier 48	0.06	Encinitas, CA	0.59
Moclips, WA	0.92	La Jolla, CA	0.73
Westport, WA	0.49	Ballast Point, CA	0.80
Long Beach, WA	1.21	S. D. Navy Pier TG, CA	0.43
East Astoria, OR	0.16	North Imperial Beach, CA	0.71
Clatsop Spit, OR	1.32	Midway I.	0.72
Bastendorf Beach, OR	0.93	Hanalei, HI	0.82
Coquille Point, OR	1.35	Nawiliwili TG, HI	0.59

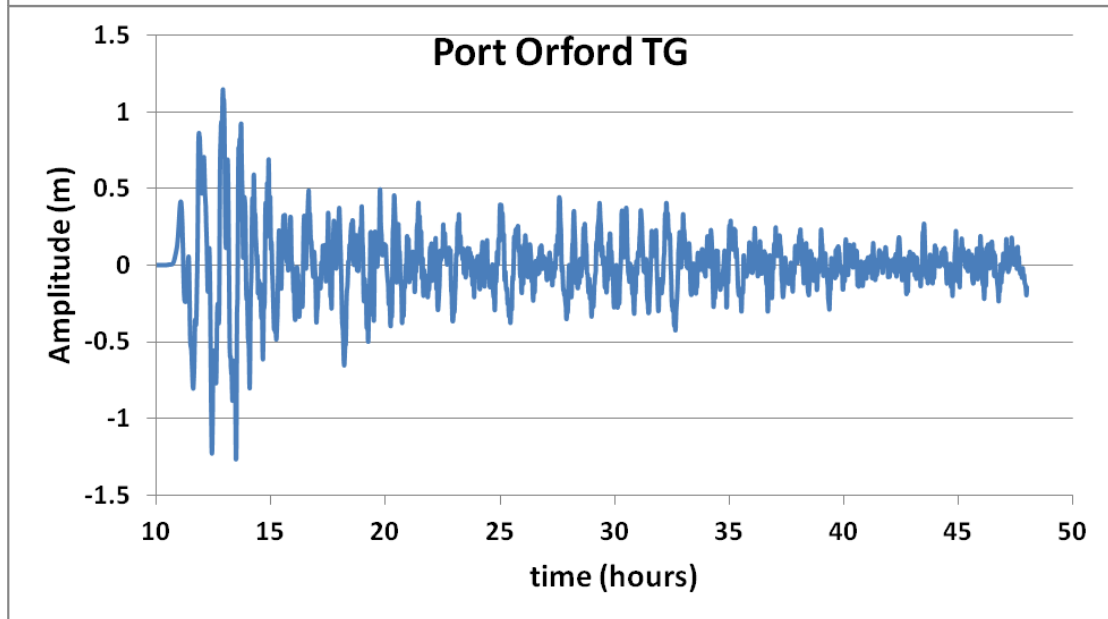
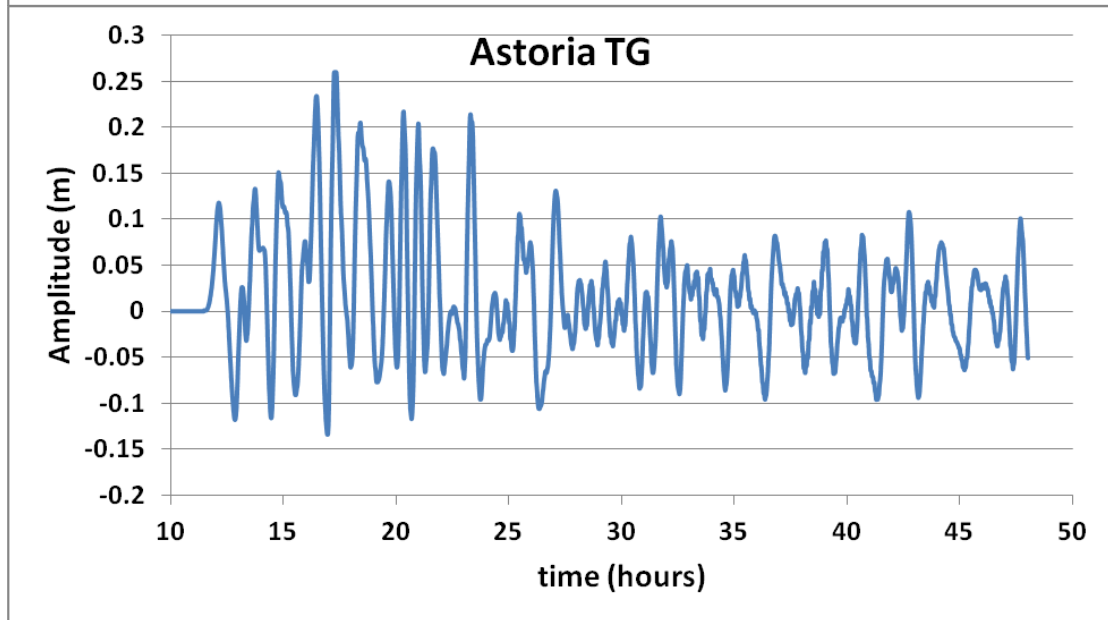
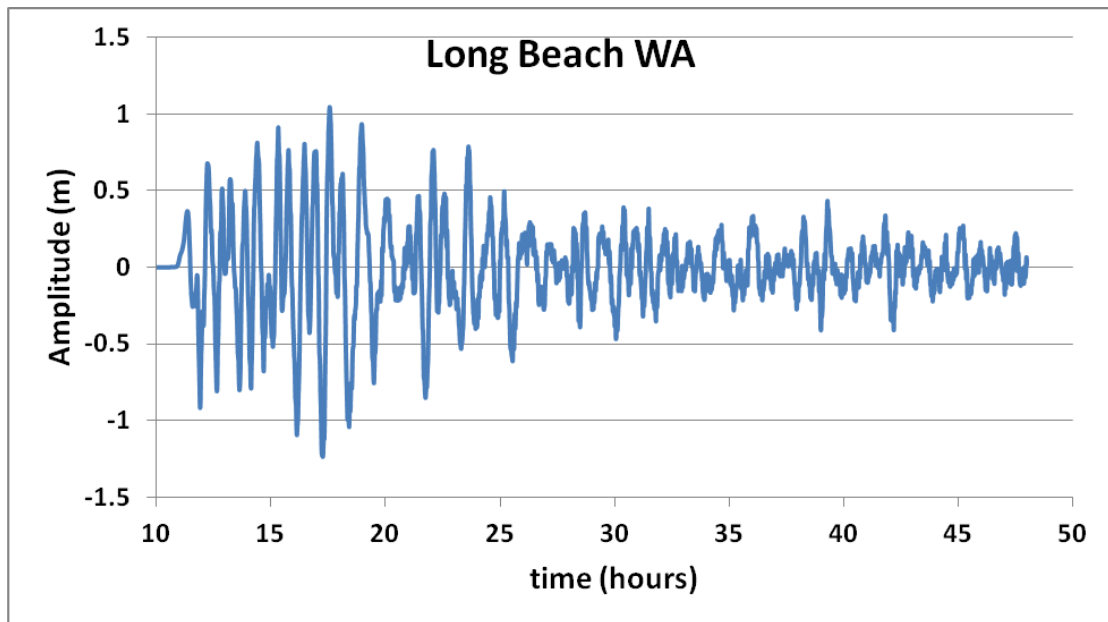
Haleiwa, HI	0.84	Kahului TG, HI	2.66
Moku O Loe I. TG, HI	0.68	Kihei, HI	3.78
Honolulu TG, HI	0.87	Kawaihae TG, HI	1.65
Kalaupapa, HI	0.45	Hilo TG, HI	0.87

Graphs showing the tsunami variation over time (known as marigrams) 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.

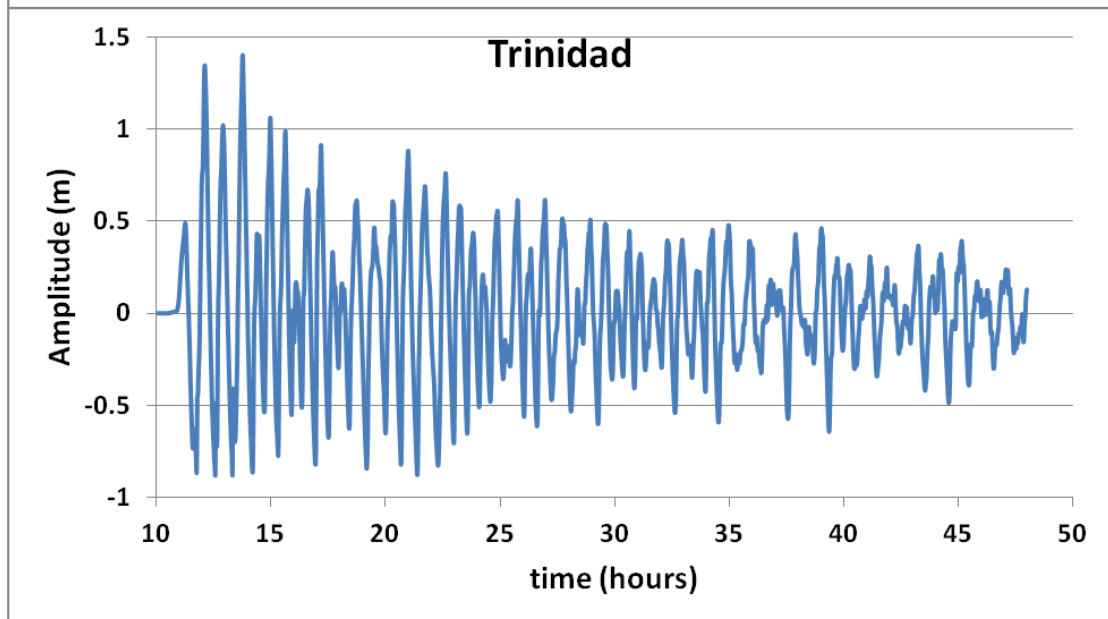
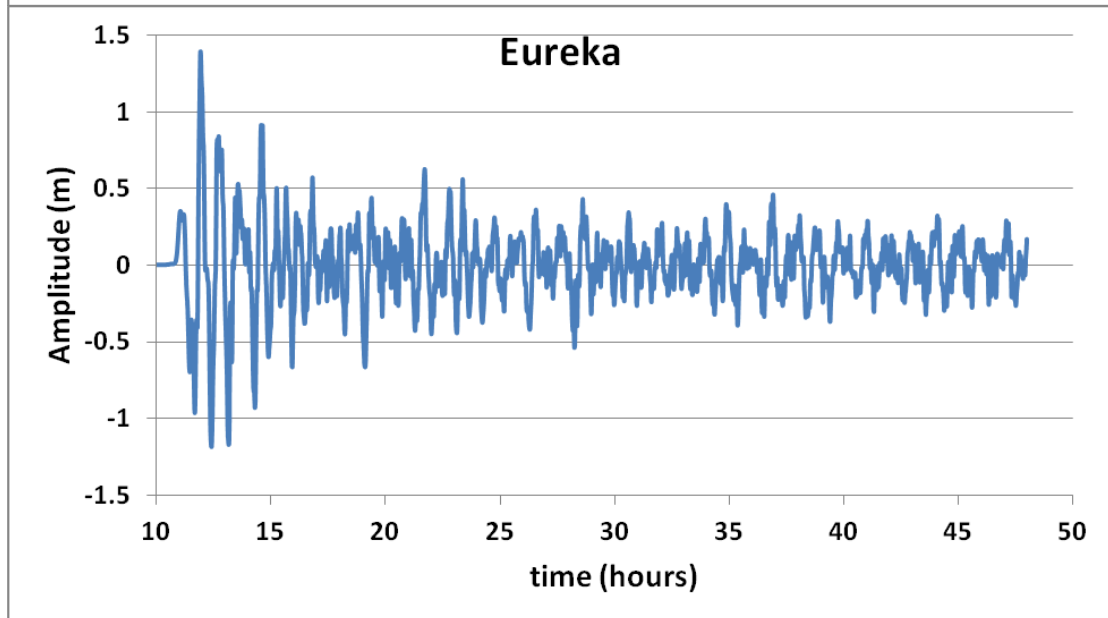
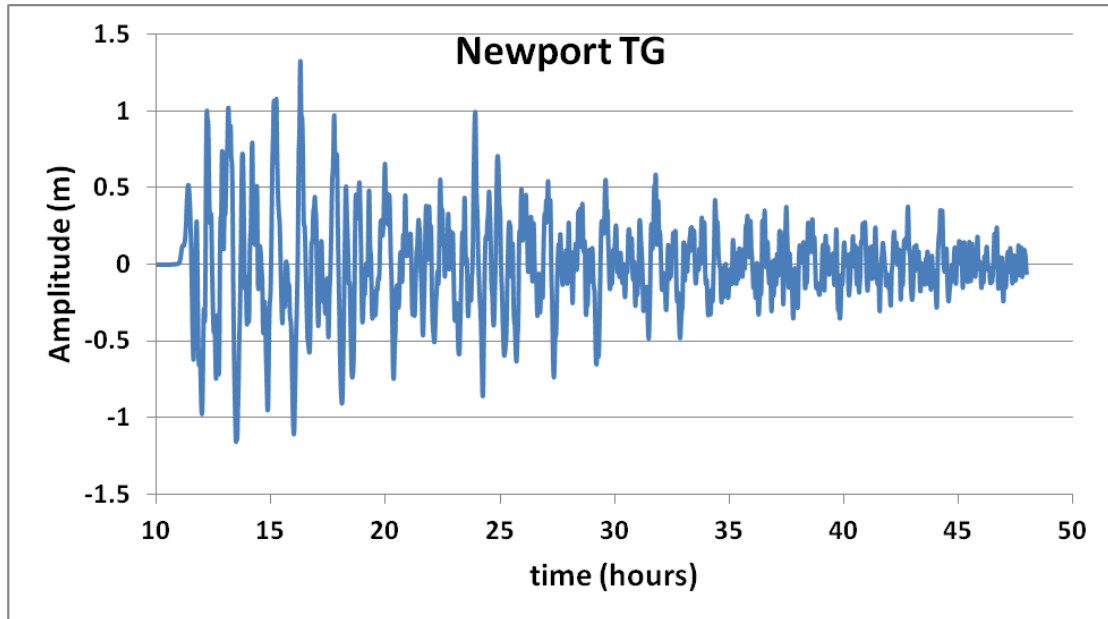












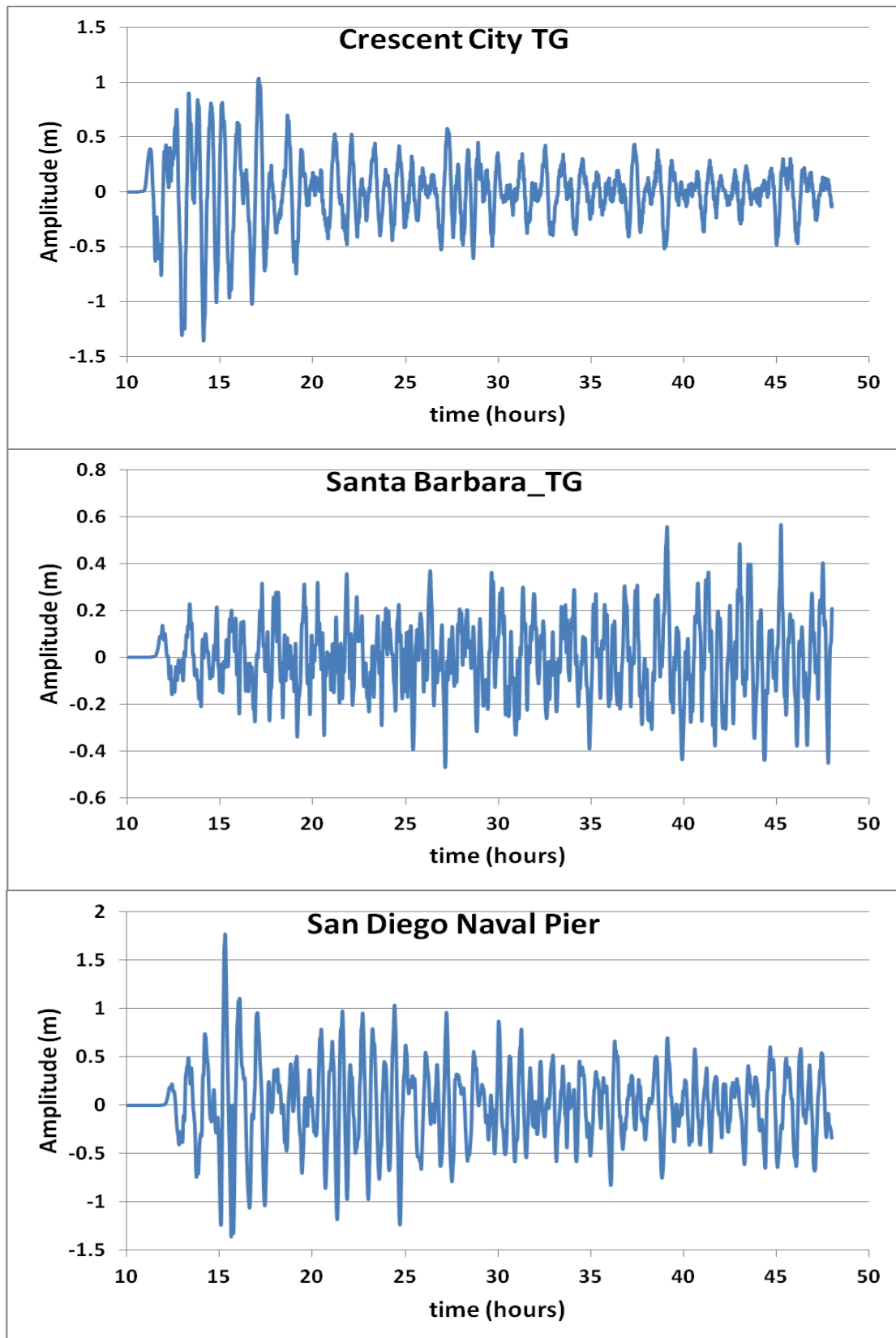


Figure B6. Modeled tsunami heights over time due to the scenario earthquake. TG is an abbreviation for tide gauge. Note that the horizontal and vertical scales are not consistent throughout all graphs. Time on the graphs is measured in hours since the earthquake occurred.

## Appendix C. WCATWC and PTWC Dummy Messages

### WCATWC Dummy Message

WEAK51 PAAQ 271805  
TSUAK1

TEST...TSUNAMI MESSAGE NUMBER 1...TEST  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
1105 AM PDT WED MAR 27 2013

...PACIFEX 13 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 13 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 271805  
TSUHWX

TEST...TSUNAMI MESSAGE NUMBER 1...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
805 AM HST WED MAR 27 2013

...PACIFEX 13 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 13 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 13 tsunami exercise, are representative of the official public products issued by the West Coast and Alaska Tsunami Warning Center during a large magnitude 9.0 earthquake and tsunami originating at 20.2°N, 146.8°E.

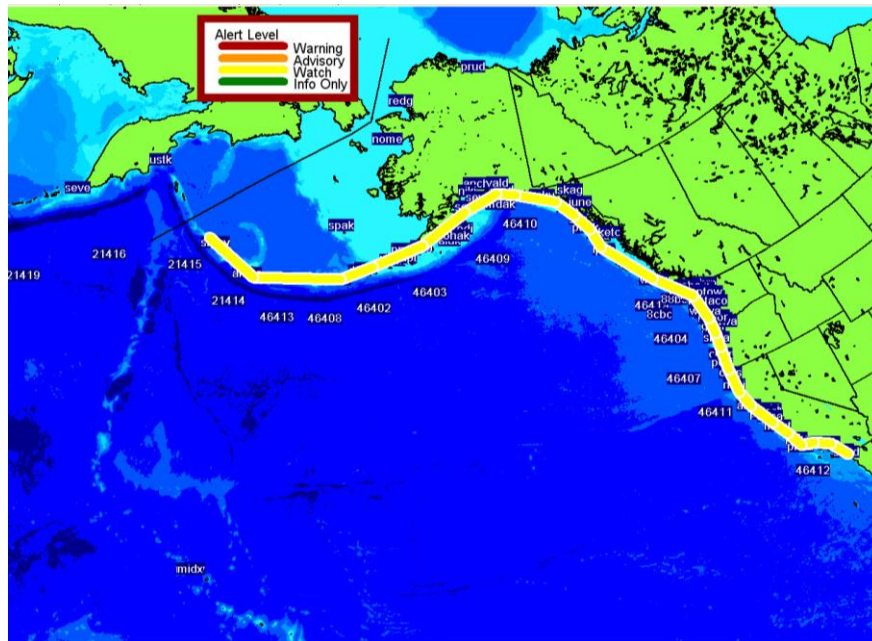


Figure D1. Alert Level after WCATWC bulletin 1 is issued.

### WCATWC Message #1

WEAK51 PAAQ 271807  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 1  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
1107 AM PDT WED MAR 27 2013

...A TSUNAMI WATCH IS NOW IN EFFECT...

WARNINGS/ADVISORIES/WATCHES - UPDATED

TSUNAMI WATCH IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 8.3

\* ORIGIN TIME        1000 AKDT MAR 27 2013  
                          1100 PDT MAR 27 2013  
                          1800 UTC MAR 27 2013  
 \* COORDINATES       20.2 NORTH 146.8 EAST  
 \* DEPTH               19 MILES  
 \* LOCATION            MARIANA ISLANDS REGION

IMPACTS FOR TSUNAMI WATCH AREAS  
 -----

\* EXPECTED IMPACT IS UNKNOWN AT THIS TIME.  
 \* THE WATCH WILL BE UPGRADED OR CANCELED AT LEAST TWO HOURS BEFORE EXPECTED IMPACT.

RECOMMENDED ACTIONS - UPDATED  
 -----

\* IF YOU ARE IN A WATCH AREA - STAY ALERT FOR FURTHER INSTRUCTIONS.  
 \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.  
 \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.  
 \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY  
 -----

SITE ----	FORECAST START OF OF TSUNAMI -----
* ALASKA	
SHEMYA	1523 AKDT MAR 27
ADAK	1602 AKDT MAR 27
DUTCH HARBOR	1711 AKDT MAR 27
SAND POINT	1748 AKDT MAR 27
COLD BAY	1820 AKDT MAR 27
KODIAK	1841 AKDT MAR 27
SEWARD	1906 AKDT MAR 27
ELFIN COVE	1908 AKDT MAR 27
YAKUTAT	1916 AKDT MAR 27
SITKA	1916 AKDT MAR 27
VALDEZ	1926 AKDT MAR 27
CORDOVA	1936 AKDT MAR 27
HOMER	1959 AKDT MAR 27
CRAIG	2017 AKDT MAR 27
* BRITISH COLUMBIA	
LANGARA	2026 PDT MAR 27
TOFINO	2139 PDT MAR 27
* OREGON	
CHARLESTON	2143 PDT MAR 27
SEASIDE	2158 PDT MAR 27
* CALIFORNIA	
CRESCENT CITY	2147 PDT MAR 27
SAN FRANCISCO	2216 PDT MAR 27
SANTA BARBARA	2223 PDT MAR 27
SAN PEDRO	2237 PDT MAR 27
LA JOLLA	2246 PDT MAR 27
* WASHINGTON	
NEAH BAY	2149 PDT MAR 27
WESTPORT	2159 PDT MAR 27

NEXT UPDATE AND ADDITIONAL INFORMATION

-----  
 \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.  
 \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.  
 \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT PTWC.WEATHER.GOV.

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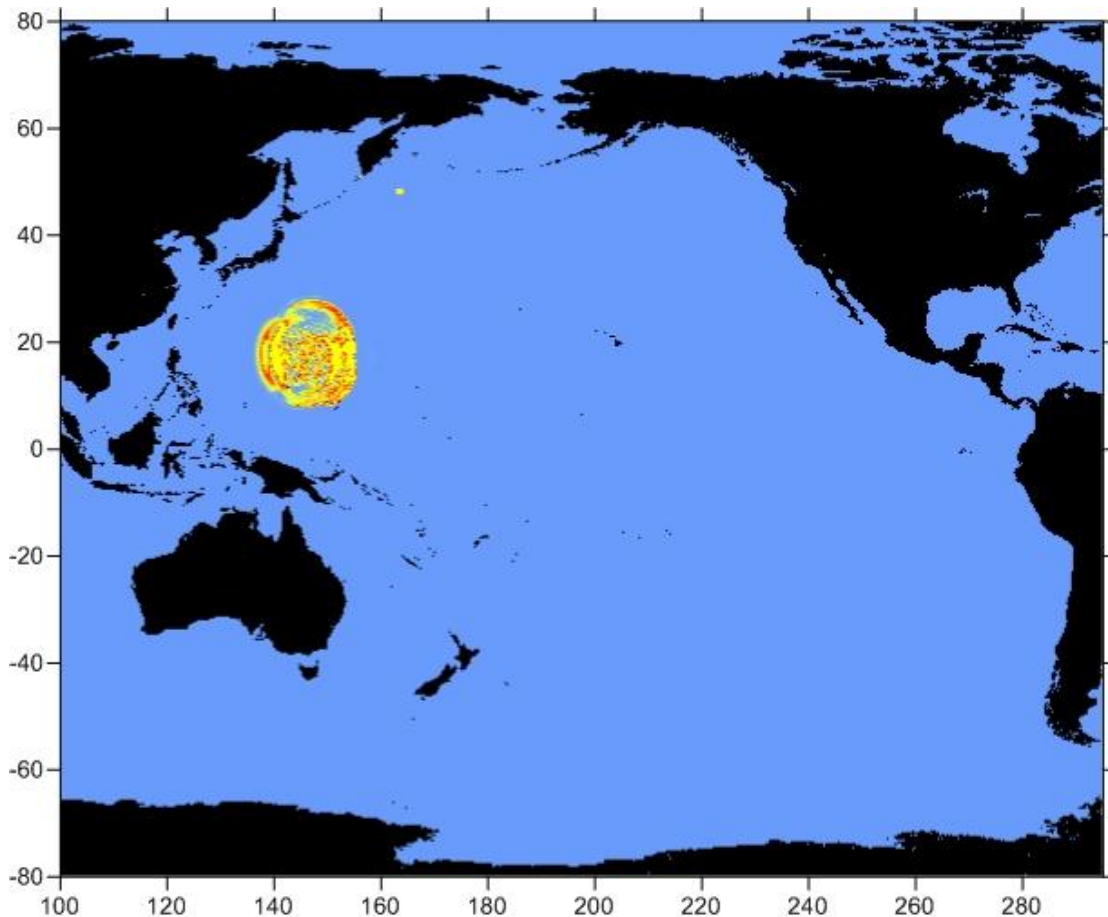


Figure D2. Snapshot of tsunami at time WCATWC bulletin 2 is issued.

**WCATWC Message #2**

WEAK51 PAAQ 271902  
 TSUAK1

BULLETIN  
 PUBLIC TSUNAMI MESSAGE NUMBER 2  
 NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
 1202 PM PDT WED MAR 27 2013

THE EARTHQUAKE MAGNITUDE HAS INCREASED TO 8.8.

...A TSUNAMI WATCH IS NOW IN EFFECT...

WARNINGS/ADVISORIES/WATCHES  
 -----

TSUNAMI WATCH IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WATCH AREAS

- \* EXPECTED IMPACT IS UNKNOWN AT THIS TIME.
- \* THE WATCH WILL BE UPGRADED OR CANCELED AT LEAST TWO HOURS BEFORE EXPECTED IMPACT.

RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WATCH AREA - STAY ALERT FOR FURTHER INSTRUCTIONS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI
* ALASKA	
SHEMYA	1519 AKDT MAR 27
ADAK	1559 AKDT MAR 27
DUTCH HARBOR	1708 AKDT MAR 27
SAND POINT	1744 AKDT MAR 27
COLD BAY	1816 AKDT MAR 27
KODIAK	1838 AKDT MAR 27
SEWARD	1903 AKDT MAR 27
ELFIN COVE	1905 AKDT MAR 27
YAKUTAT	1912 AKDT MAR 27
SITKA	1912 AKDT MAR 27
VALDEZ	1922 AKDT MAR 27
CORDOVA	1932 AKDT MAR 27
HOMER	1955 AKDT MAR 27
CRAIG	2013 AKDT MAR 27
* BRITISH COLUMBIA	
LANGARA	2022 PDT MAR 27
TOFINO	2137 PDT MAR 27
* OREGON	
CHARLESTON	2141 PDT MAR 27
SEASIDE	2156 PDT MAR 27
* CALIFORNIA	
CRESCENT CITY	2146 PDT MAR 27
SAN FRANCISCO	2216 PDT MAR 27
SANTA BARBARA	2223 PDT MAR 27
SAN PEDRO	2237 PDT MAR 27
LA JOLLA	2246 PDT MAR 27
* WASHINGTON	
NEAH BAY	2147 PDT MAR 27
WESTPORT	2157 PDT MAR 27

PRELIMINARY EARTHQUAKE PARAMETERS - UPDATED

- \* MAGNITUDE 8.8

\* ORIGIN TIME        1000 AKDT MAR 27 2013  
                          1100 PDT MAR 27 2013  
                          1800 UTC MAR 27 2013  
 \* COORDINATES       20.2 NORTH 146.8 EAST  
 \* DEPTH              19 MILES  
 \* LOCATION           MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
- \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
- \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT PTWC.WEATHER.GOV.

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**WCATWC Message #3**

WEAK51 PAAQ 272003  
 TSUAK1

BULLETIN  
 PUBLIC TSUNAMI MESSAGE NUMBER 3  
 NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
 103 PM PDT WED MAR 27 2013

THE EARTHQUAKE MAGNITUDE HAS INCREASED TO 9.0.

...A TSUNAMI WATCH IS NOW IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

TSUNAMI WATCH IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WATCH AREAS

- \* EXPECTED IMPACT IS UNKNOWN AT THIS TIME.
- \* THE WATCH WILL BE UPGRADED OR CANCELED AT LEAST TWO HOURS BEFORE EXPECTED IMPACT.

RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WATCH AREA - STAY ALERT FOR FURTHER INSTRUCTIONS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

	FORECAST
	START OF
	OF TSUNAMI
SITE	-----
----	



\* ALASKA

SHEMYA 1523 AKDT MAR 27  
 ADAK 1602 AKDT MAR 27  
 DUTCH HARBOR 1711 AKDT MAR 27  
 SAND POINT 1748 AKDT MAR 27  
 COLD BAY 1820 AKDT MAR 27  
 KODIAK 1841 AKDT MAR 27  
 SEWARD 1906 AKDT MAR 27  
 ELFIN COVE 1908 AKDT MAR 27  
 YAKUTAT 1916 AKDT MAR 27  
 SITKA 1916 AKDT MAR 27  
 VALDEZ 1926 AKDT MAR 27  
 CORDOVA 1936 AKDT MAR 27  
 HOMER 1959 AKDT MAR 27  
 CRAIG 2017 AKDT MAR 27

\* BRITISH COLUMBIA

LANGARA 2026 PDT MAR 27  
 TOFINO 2139 PDT MAR 27

\* OREGON

CHARLESTON 2143 PDT MAR 27  
 SEASIDE 2158 PDT MAR 27

\* CALIFORNIA

CRESCENT CITY 2147 PDT MAR 27  
 SAN FRANCISCO 2216 PDT MAR 27  
 SANTA BARBARA 2223 PDT MAR 27  
 SAN PEDRO 2237 PDT MAR 27  
 LA JOLLA 2246 PDT MAR 27

\* WASHINGTON

NEAH BAY 2149 PDT MAR 27  
 WESTPORT 2159 PDT MAR 27

GUAM HAS REPORTED SOME MINOR FLOODING ALONG HIGHWAY 4 NEAR MERIZO PIER PARK AND FIRST BEACH. THERE ARE NO REPORTED INJURIES OR DAMAGE AT THIS TIME.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
GUAM	1856 UTC 3-27	0.81 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

DEEP OCEAN PRESSURE SENSOR DATA INDICATES A TSUNAMI WAS GENERATED.

PRELIMINARY EARTHQUAKE PARAMETERS - UPDATED

\* MAGNITUDE 9.0  
 \* ORIGIN TIME 1000 AKDT MAR 27 2013  
 1100 PDT MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES



WARNINGS/ADVISORIES/WATCHES - UPDATED

-----  
 TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO POINT CONCEPTION CALIFORNIA
- \* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.
- \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
- \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS - UPDATED

- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT EXPECTED FOR ADVISORY AREAS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
----	-----	-----	-----	-----
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	
KODIAK	1836 AKDT MAR 27		Less than 1 FT	
SEWARD	1901 AKDT MAR 27		Less than 1 FT	
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	

YAKUTAT 1910 AKDT MAR 27 6 HRS 1.2FT +/- 0.4  
 SITKA 1910 AKDT MAR 27 12 HRS 2.9FT +/- 0.9  
 VALDEZ 1920 AKDT MAR 27 Less than 1 FT  
 CORDOVA 1930 AKDT MAR 27 Less than 1 FT  
 HOMER 1953 AKDT MAR 27 Less than 1 FT  
 CRAIG 2011 AKDT MAR 27

\* BRITISH COLUMBIA

LANGARA 2020 PDT MAR 27 Less than 1 FT  
 TOFINO 2136 PDT MAR 27 9 HRS 2.2FT +/- 0.7

\* OREGON

CHARLESTON 2140 PDT MAR 27 6 HRS 1.3FT +/- 0.4  
 SEASIDE 2155 PDT MAR 27 15 HRS 3.3FT +/- 1.0

\* CALIFORNIA

CRESCENT CITY 2145 PDT MAR 27 21 HRS 4.8FT +/- 1.4  
 SAN FRANCISCO 2215 PDT MAR 27 6 HRS 1.5FT +/- 0.5  
 SANTA BARBARA 2223 PDT MAR 27 Less than 1 FT  
 SAN PEDRO 2237 PDT MAR 27 6 HRS 1.1FT +/- 0.3  
 LA JOLLA 2245 PDT MAR 27 9 HRS 1.9FT +/- 0.6

\* WASHINGTON

NEAH BAY 2146 PDT MAR 27 Less than 1 FT  
 WESTPORT 2156 PDT MAR 27 6 HRS 1.3FT +/- 0.4

POHNPEI ISLAND MICRONESIA IS REPORTING SOME FLOODING ALONG DEKETIK CAUSEWAY THAT IS SLOWING TRAFFIC IN THE AREA. THE PUBLIC MARKET AND THE JAPANESE EMBASSY IN THIS IMMEDIATE AREA WERE FLOODED AND FIRST REPORTS NOTE DAMAGE AS HIGH. WAKE ISLAND REPORTS APPROXIMATELY 1.50 FEET OF WATER FLOODING PORTIONS OF THE RUNWAY. FIGHTER PLANES HAVE BEEN MOVED TO REDUCE THE LIKELIHOOD OF CORROSION ON THE LANDING GEAR.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
GUAM	1856 UTC 3-27	0.81 FT
POHNPEI IS	2002 UTC 3-27	1.56 FT
WAKE IS	2028 UTC 3-27	1.47 FT
KUSHIRO JAPAN	2045 UTC 3-27	0.68 FT
KWAJALEIN	2057 UTC 3-27	0.73 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

\* MAGNITUDE 9.0  
 \* ORIGIN TIME 1000 AKDT MAR 27 2013  
 1100 PDT MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- 
- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
  - \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
  - \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT PTWC.WEATHER.GOV.

\$\$

**WCATWC Message #5**

WEAK51 PAAQ 272202  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 5  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
302 PM PDT WED MAR 27 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
TSUNAMI WARNING IN EFFECT FOR...

\* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

\* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO POINT CONCEPTION CALIFORNIA

\* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- 
- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.
  - \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.
  - \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- 
- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
  - \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL

STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI ARRIVAL.

- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT EXPECTED FOR ADVISORY AREAS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	
KODIAK	1836 AKDT MAR 27		Less than 1 FT	
SEWARD	1901 AKDT MAR 27		Less than 1 FT	
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	
YAKUTAT	1910 AKDT MAR 27	6 HRS	1.2FT +/- 0.4	
SITKA	1910 AKDT MAR 27	12 HRS	2.9FT +/- 0.9	
VALDEZ	1920 AKDT MAR 27		Less than 1 FT	
CORDOVA	1930 AKDT MAR 27		Less than 1 FT	
HOMER	1953 AKDT MAR 27		Less than 1 FT	
CRAIG	2011 AKDT MAR 27			
* BRITISH COLUMBIA				
LANGARA	2020 PDT MAR 27		Less than 1 FT	
TOFINO	2136 PDT MAR 27	9 HRS	2.2FT +/- 0.7	
* OREGON				
CHARLESTON	2140 PDT MAR 27	6 HRS	1.3FT +/- 0.4	
SEASIDE	2155 PDT MAR 27	15 HRS	3.3FT +/- 1.0	
* CALIFORNIA				
CRESCENT CITY	2145 PDT MAR 27	21 HRS	4.8FT +/- 1.4	
SAN FRANCISCO	2215 PDT MAR 27	6 HRS	1.5FT +/- 0.5	
SANTA BARBARA	2223 PDT MAR 27		Less than 1 FT	
SAN PEDRO	2237 PDT MAR 27	6 HRS	1.1FT +/- 0.3	
LA JOLLA	2245 PDT MAR 27	9 HRS	1.9FT +/- 0.6	
* WASHINGTON				
NEAH BAY	2146 PDT MAR 27		Less than 1 FT	
WESTPORT	2156 PDT MAR 27	6 HRS	1.3FT +/- 0.4	

KWAJALEIN ATOLL HAS REPORTED A WAVE APPROXIMATELY 0.8 FEET THAT CAME ASHORE FAR ENOUGH TO FLOOD PORTIONS OF THE KWAJ LODGE. RABAUl PAPUA NEW GUINEA HAS REPORTED THAT ONE PERSON WAS KILLED WHEN A 1.40 FOOT WAVE SURGED A BOAT ONTO A PERSON STANDING NEXT TO A CONCRETE WALL. THIS WAVE WAS REPORTED TO HAVE CAUSED SOME DAMAGE TO BUILDINGS ALONG THE WATERFRONT. MAJURO MARSHALL IS

REPORTS THAT A ONE-FOOT HIGH WAVE CAME ASHORE AND CAUSED SOME FLOODING AT LAURA PUBLIC ELEMENTARY SCHOOL AND JAPANESE MEMORIAL BEACH PARK.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
POHNPEI IS	2002 UTC 3-27	1.56 FT
WAKE IS	2028 UTC 3-27	1.47 FT
KUSHIRO JAPAN	2045 UTC 3-27	0.68 FT
KWAJALEIN	2057 UTC 3-27	0.73 FT
RABAUl PAPUA NEW GUINEA	2122 UTC 3-27	1.32 FT
MAJURO MARSHALL IS	2133 UTC 3-27	0.98 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 9.0
- \* ORIGIN TIME 1000 AKDT MAR 27 2013  
1100 PDT MAR 27 2013  
1800 UTC MAR 27 2013
- \* COORDINATES 20.2 NORTH 146.8 EAST
- \* DEPTH 19 MILES
- \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
- \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
- \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT PTWC.WEATHER.GOV.

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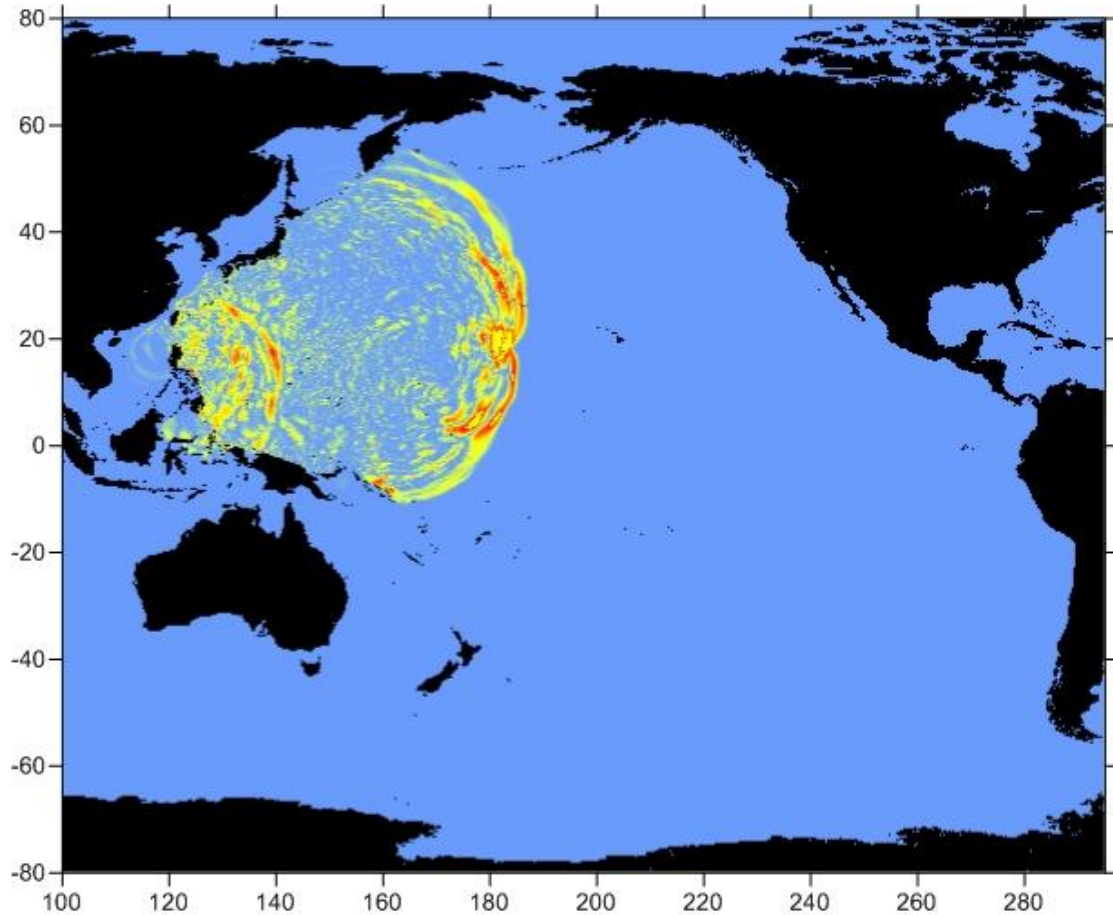


Figure D4. Snapshot of tsunami at time WCATWC bulletin 6 is issued.

**WCATWC Message #6**

WEAK51 PAAQ 272302  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 6  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
402 PM PDT WED MAR 27 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY  
REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT  
CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO  
BORDER TO POINT CONCEPTION CALIFORNIA



- \* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.
- \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
- \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT EXPECTED FOR ADVISORY AREAS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	
KODIAK	1836 AKDT MAR 27		Less than 1 FT	
SEWARD	1901 AKDT MAR 27		Less than 1 FT	
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	
YAKUTAT	1910 AKDT MAR 27	6 HRS	1.2FT +/- 0.4	
SITKA	1910 AKDT MAR 27	12 HRS	2.9FT +/- 0.9	
VALDEZ	1920 AKDT MAR 27		Less than 1 FT	
CORDOVA	1930 AKDT MAR 27		Less than 1 FT	
HOMER	1953 AKDT MAR 27		Less than 1 FT	
CRAIG	2011 AKDT MAR 27			
* BRITISH COLUMBIA				
LANGARA	2020 PDT MAR 27		Less than 1 FT	
TOFINO	2136 PDT MAR 27	9 HRS	2.2FT +/- 0.7	

\* OREGON  
 CHARLESTON 2140 PDT MAR 27 6 HRS 1.3FT +/- 0.4  
 SEASIDE 2155 PDT MAR 27 15 HRS 3.3FT +/- 1.0

\* CALIFORNIA  
 CRESCENT CITY 2145 PDT MAR 27 21 HRS 4.8FT +/- 1.4  
 SAN FRANCISCO 2215 PDT MAR 27 6 HRS 1.5FT +/- 0.5  
 SANTA BARBARA 2223 PDT MAR 27 Less than 1 FT  
 SAN PEDRO 2237 PDT MAR 27 6 HRS 1.1FT +/- 0.3  
 LA JOLLA 2245 PDT MAR 27 9 HRS 1.9FT +/- 0.6

\* WASHINGTON  
 NEAH BAY 2146 PDT MAR 27 Less than 1 FT  
 WESTPORT 2156 PDT MAR 27 6 HRS 1.3FT +/- 0.4

MIDWAY ISLAND REPORTS THAT A ONE-FOOT SURGE FLOODED THE SOUTHWEST PORTION OF THE RUNWAY. POHNPEI ISLAND HAS REPORTED AN INITIAL DAMAGE ESTIMATE OF \$200,00 FROM FLOODING.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
POHNPEI IS	2002 UTC 3-27	1.56 FT
WAKE IS	2028 UTC 3-27	1.47 FT
KUSHIRO JAPAN	2045 UTC 3-27	0.68 FT
KWAJALEIN	2057 UTC 3-27	0.73 FT
RABAUl PAPUA NEW GUINEA	2122 UTC 3-27	1.32 FT
MAJURO MARSHALL IS	2133 UTC 3-27	0.98 FT
MIDWAY IS	2231 UTC 3-27	1.02 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

\* MAGNITUDE 9.0  
 \* ORIGIN TIME 1000 AKDT MAR 27 2013  
 1100 PDT MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

\* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.

\* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

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

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**WCATWC Message #7**

WEAK51 PAAQ 280002  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 7  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
502 PM PDT WED MAR 27 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY  
REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT  
CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO  
BORDER TO POINT CONCEPTION CALIFORNIA
- \* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND  
ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- 
- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS  
EXPECTED.
  - \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL  
CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER  
TSUNAMI ARRIVAL.
  - \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- 
- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS  
TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
  - \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL  
STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI  
ARRIVAL.
  - \* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS

- 
- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
  - \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF  
HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT  
EXPECTED FOR ADVISORY AREAS.
  - \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
  - \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.

\* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	0.7FT
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	
KODIAK	1836 AKDT MAR 27		Less than 1 FT	
SEWARD	1901 AKDT MAR 27		Less than 1 FT	
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	
YAKUTAT	1910 AKDT MAR 27	6 HRS	1.2FT +/- 0.4	
SITKA	1910 AKDT MAR 27	12 HRS	2.9FT +/- 0.9	
VALDEZ	1920 AKDT MAR 27		Less than 1 FT	
CORDOVA	1930 AKDT MAR 27		Less than 1 FT	
HOMER	1953 AKDT MAR 27		Less than 1 FT	
CRAIG	2011 AKDT MAR 27			
* BRITISH COLUMBIA				
LANGARA	2020 PDT MAR 27		Less than 1 FT	
TOFINO	2136 PDT MAR 27	9 HRS	2.2FT +/- 0.7	
* OREGON				
CHARLESTON	2140 PDT MAR 27	6 HRS	1.3FT +/- 0.4	
SEASIDE	2155 PDT MAR 27	15 HRS	3.3FT +/- 1.0	
* CALIFORNIA				
CRESCENT CITY	2145 PDT MAR 27	21 HRS	4.8FT +/- 1.4	
SAN FRANCISCO	2215 PDT MAR 27	6 HRS	1.5FT +/- 0.5	
SANTA BARBARA	2223 PDT MAR 27		Less than 1 FT	
SAN PEDRO	2237 PDT MAR 27	6 HRS	1.1FT +/- 0.3	
LA JOLLA	2245 PDT MAR 27	9 HRS	1.9FT +/- 0.6	
* WASHINGTON				
NEAH BAY	2146 PDT MAR 27		Less than 1 FT	
WESTPORT	2156 PDT MAR 27	6 HRS	1.3FT +/- 0.4	

RABUL PAPUA NEW GUINEA REPORTED AN INITIAL DAMAGE ESTIMATE OF \$157,000 FROM FLOODING.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
RABAUL PAPUA NEW GUINEA	2122 UTC 3-27	1.32 FT
MAJURO MARSHALL IS	2133 UTC 3-27	0.98 FT
MIDWAY IS	2231 UTC 3-27	1.02 FT
JOHNSTON IS	2341 UTC 3-27	1.12 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE  
TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

-----  
 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 1000 AKDT MAR 27 2013  
 1100 PDT MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

-----  
 \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.  
 \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE  
 INFORMATION.  
 \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON...  
 WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE  
 PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS  
 EVENT AT PTWC.WEATHER.GOV.

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**WCATWC Message #8**

WEAK51 PAAQ 280103  
 TSUAK1

BULLETIN

PUBLIC TSUNAMI MESSAGE NUMBER 8  
 NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
 603 PM PDT WED MAR 27 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY  
 REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
 TSUNAMI WARNING IN EFFECT FOR...

\* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT  
 CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

\* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO  
 BORDER TO POINT CONCEPTION CALIFORNIA

\* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND  
 ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.
- \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
- \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT EXPECTED FOR ADVISORY AREAS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	0.7FT
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	
KODIAK	1836 AKDT MAR 27		Less than 1 FT	
SEWARD	1901 AKDT MAR 27		Less than 1 FT	
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	
YAKUTAT	1910 AKDT MAR 27	6 HRS	1.2FT +/- 0.4	
SITKA	1910 AKDT MAR 27	12 HRS	2.9FT +/- 0.9	
VALDEZ	1920 AKDT MAR 27		Less than 1 FT	
CORDOVA	1930 AKDT MAR 27		Less than 1 FT	
HOMER	1953 AKDT MAR 27		Less than 1 FT	
CRAIG	2011 AKDT MAR 27			
* BRITISH COLUMBIA				
LANGARA	2020 PDT MAR 27		Less than 1 FT	
TOFINO	2136 PDT MAR 27	9 HRS	2.2FT +/- 0.7	
* OREGON				
CHARLESTON	2140 PDT MAR 27	6 HRS	1.3FT +/- 0.4	
SEASIDE	2155 PDT MAR 27	15 HRS	3.3FT +/- 1.0	

\* CALIFORNIA  
 CRESCENT CITY 2145 PDT MAR 27 21 HRS 4.8FT +/- 1.4  
 SAN FRANCISCO 2215 PDT MAR 27 6 HRS 1.5FT +/- 0.5  
 SANTA BARBARA 2223 PDT MAR 27 Less than 1 FT  
 SAN PEDRO 2237 PDT MAR 27 6 HRS 1.1FT +/- 0.3  
 LA JOLLA 2245 PDT MAR 27 9 HRS 1.9FT +/- 0.6

\* WASHINGTON  
 NEAH BAY 2146 PDT MAR 27 Less than 1 FT  
 WESTPORT 2156 PDT MAR 27 6 HRS 1.3FT +/- 0.4

SHEMYA HAS REPORTED THAT A 0.7-FOOT SURGE CAME ASHORE AND THERE HAS BEEN NO KNOWN DAMAGE THUS FAR. NAWILIWILI HAWAII REPORTED THAT A 0.8-FOOT SURGE FLOODED PORTIONS OF THE KAUAI MARRIOTT RESORT AND BEACH CLUB, AND RESULTED IN SMALL-BOAT DAMAGE IN THE NAWILIWILI YACHT CLUB.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
MIDWAY IS	2231 UTC 3-27	1.02 FT
JOHNSTON IS	2341 UTC 3-27	1.12 FT
SHEMYA AK	0000 UTC 3-28	0.66 FT
WEST ATKA AK	0012 UTC 3-28	0.79 FT
NAWILIWILI HI	0056 UTC 3-28	0.75 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

\* MAGNITUDE 9.0  
 \* ORIGIN TIME 1000 AKDT MAR 27 2013  
 1100 PDT MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
- \* REFER TO THE INTERNET SITE [WCATWC.ARH.NOAA.GOV](http://WCATWC.ARH.NOAA.GOV) FOR MORE INFORMATION.
- \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV).

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**WCATWC Message #9**

WEAK51 PAAQ 280202  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 9  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
702 PM PDT WED MAR 27 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY  
REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT  
CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO  
BORDER TO POINT CONCEPTION CALIFORNIA
- \* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND  
ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- 
- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS  
EXPECTED.
  - \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL  
CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER  
TSUNAMI ARRIVAL.
  - \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- 
- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS  
TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
  - \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL  
STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI  
ARRIVAL.
  - \* THE FIRST WAVE MAY NOT BE THE LARGEST.



RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT EXPECTED FOR ADVISORY AREAS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	1.4FT
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	0.5FT
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	
KODIAK	1836 AKDT MAR 27		Less than 1 FT	
SEWARD	1901 AKDT MAR 27		Less than 1 FT	
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	
YAKUTAT	1910 AKDT MAR 27	6 HRS	1.2FT +/- 0.4	
SITKA	1910 AKDT MAR 27	12 HRS	2.9FT +/- 0.9	
VALDEZ	1920 AKDT MAR 27		Less than 1 FT	
CORDOVA	1930 AKDT MAR 27		Less than 1 FT	
HOMER	1953 AKDT MAR 27		Less than 1 FT	
CRAIG	2011 AKDT MAR 27			
* BRITISH COLUMBIA				
LANGARA	2020 PDT MAR 27		Less than 1 FT	
TOFINO	2136 PDT MAR 27	9 HRS	2.2FT +/- 0.7	
* OREGON				
CHARLESTON	2140 PDT MAR 27	6 HRS	1.3FT +/- 0.4	
SEASIDE	2155 PDT MAR 27	15 HRS	3.3FT +/- 1.0	
* CALIFORNIA				
CRESCENT CITY	2145 PDT MAR 27	21 HRS	4.8FT +/- 1.4	
SAN FRANCISCO	2215 PDT MAR 27	6 HRS	1.5FT +/- 0.5	
SANTA BARBARA	2223 PDT MAR 27		Less than 1 FT	
SAN PEDRO	2237 PDT MAR 27	6 HRS	1.1FT +/- 0.3	
LA JOLLA	2245 PDT MAR 27	9 HRS	1.9FT +/- 0.6	
* WASHINGTON				
NEAH BAY	2146 PDT MAR 27		Less than 1 FT	
WESTPORT	2156 PDT MAR 27	6 HRS	1.3FT +/- 0.4	

KAWAIIHAE HAWAII REPORTED A TIDAL SURGE OF 4.5 FEET THAT RESULTED IN MUCH FLOODING AS FAR INLAND AS AKONI PULE HIGHWAY. THREE PEOPLE DIED WHEN THEIR SMALL BOAT WAS FLIPPED BY THE TIDAL SURGE AND PREVENTED THEIR ESCAPE TO THE SURFACE. KAHULHI HAWAII REPORTED A SEVEN-FOOT SURGE WHICH CAUSED DAMAGE TO SEVERAL STORAGE CONTAINERS LOCATED ON HOBRON AVE AND WHARF STREET. KAHULUI BEACH ROAD WAS FLOODED IN MANY AREAS AS WERE MANY HOMES WITHIN 50 FEET OF THE WATER. HILO HAWAII HAS REPORTED A TWO-FOOT SURGE THAT FLOODED BAYFRONT PARK AND THE PACIFIC TSUNAMI MUSEUM.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL

ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
JOHNSTON IS	2341 UTC 3-27	1.12 FT
NAWILIWILI HI	0056 UTC 3-28	0.75 FT
HONOLULU HI	0108 UTC 3-28	1.14 FT
SHEMYA AK	0109 UTC 3-28	1.35 FT
KAWAIHAE HI	0128 UTC 3-28	4.33 FT
NIKOLSKI AK	0129 UTC 3-28	0.56 FT
AKUTAN ISLAND AK	0130 UTC 3-28	0.62 FT
KAHULUI HI	0135 UTC 3-28	6.96 FT
DUTCH HARBOR AK	0142 UTC 3-28	0.52 FT
HILO HI	0146 UTC 3-28	2.30 FT
WEST ATKA AK	0148 UTC 3-28	1.54 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 9.0
- \* ORIGIN TIME 1000 AKDT MAR 27 2013  
1100 PDT MAR 27 2013  
1800 UTC MAR 27 2013
- \* COORDINATES 20.2 NORTH 146.8 EAST
- \* DEPTH 19 MILES
- \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
- \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
- \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT PTWC.WEATHER.GOV.

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**WCATWC Message #10**

WEAK51 PAAQ 280302  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 10  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
802 PM PDT WED MAR 27 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO POINT CONCEPTION CALIFORNIA
- \* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.
- \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
- \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT EXPECTED FOR ADVISORY AREAS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
-----	-----	-----	-----	-----
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	1.4FT
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	0.5FT

SAND POINT	1742	AKDT	MAR 27		Less than 1 FT	0.3FT
COLD BAY	1814	AKDT	MAR 27		Less than 1 FT	0.3FT
KODIAK	1836	AKDT	MAR 27		Less than 1 FT	
SEWARD	1901	AKDT	MAR 27		Less than 1 FT	
ELFIN COVE	1903	AKDT	MAR 27		Less than 1 FT	
YAKUTAT	1910	AKDT	MAR 27	6 HRS	1.2FT +/-	0.4
SITKA	1910	AKDT	MAR 27	12 HRS	2.9FT +/-	0.9
VALDEZ	1920	AKDT	MAR 27		Less than 1 FT	
CORDOVA	1930	AKDT	MAR 27		Less than 1 FT	
HOMER	1953	AKDT	MAR 27		Less than 1 FT	
CRAIG	2011	AKDT	MAR 27			

\* BRITISH COLUMBIA

LANGARA	2020	PDT	MAR 27		Less than 1 FT	
TOFINO	2136	PDT	MAR 27	9 HRS	2.2FT +/-	0.7

\* OREGON

CHARLESTON	2140	PDT	MAR 27	6 HRS	1.3FT +/-	0.4
SEASIDE	2155	PDT	MAR 27	15 HRS	3.3FT +/-	1.0

\* CALIFORNIA

CRESCENT CITY	2145	PDT	MAR 27	21 HRS	4.8FT +/-	1.4
SAN FRANCISCO	2215	PDT	MAR 27	6 HRS	1.5FT +/-	0.5
SANTA BARBARA	2223	PDT	MAR 27		Less than 1 FT	
SAN PEDRO	2237	PDT	MAR 27	6 HRS	1.1FT +/-	0.3
LA JOLLA	2245	PDT	MAR 27	9 HRS	1.9FT +/-	0.6

\* WASHINGTON

NEAH BAY	2146	PDT	MAR 27		Less than 1 FT	
WESTPORT	2156	PDT	MAR 27	6 HRS	1.3FT +/-	0.4

ATKA ALASKA HAS REPORTED A 1.5-FOOT SURGE THAT HAS FLOODED PORTIONS OF ALXAX WAY THAT LEADS TO THE AIRPORT.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
NAWILIWILI HI	0056 UTC 3-28	0.75 FT
HONOLULU HI	0108 UTC 3-28	1.14 FT
SHEMYA AK	0109 UTC 3-28	1.35 FT
KAWAIHAE HI	0128 UTC 3-28	4.33 FT
NIKOLSKI AK	0129 UTC 3-28	0.56 FT
KAHULUI HI	0135 UTC 3-28	6.96 FT
DUTCH HARBOR AK	0142 UTC 3-28	0.52 FT
HILO HI	0146 UTC 3-28	2.30 FT
WEST ATKA AK	0148 UTC 3-28	1.54 FT
SAND POINT AK	0224 UTC 3-28	0.30 FT
AKUTAN ISLAND AK	0240 UTC 3-28	0.89 FT
COLD BAY AK	0254 UTC 3-28	0.33 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

\* MAGNITUDE 9.0

\* ORIGIN TIME 1000 AKDT MAR 27 2013  
1100 PDT MAR 27 2013  
1800 UTC MAR 27 2013  
\* COORDINATES 20.2 NORTH 146.8 EAST  
\* DEPTH 19 MILES  
\* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- 
- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
  - \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
  - \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT PTWC.WEATHER.GOV.

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**WCATWC Message #11**

WEAK51 PAAQ 280401  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 11  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
901 PM PDT WED MAR 27 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO POINT CONCEPTION CALIFORNIA
- \* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- 
- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.
  - \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.
  - \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
- \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT EXPECTED FOR ADVISORY AREAS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	1.4FT
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	0.5FT
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	0.3FT
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	0.3FT
KODIAK	1836 AKDT MAR 27		Less than 1 FT	0.2FT
SEWARD	1901 AKDT MAR 27		Less than 1 FT	0.2FT
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	0.4FT
YAKUTAT	1910 AKDT MAR 27	6 HRS	1.2FT +/- 0.4	
SITKA	1910 AKDT MAR 27	12 HRS	2.9FT +/- 0.9	
VALDEZ	1920 AKDT MAR 27		Less than 1 FT	
CORDOVA	1930 AKDT MAR 27		Less than 1 FT	
HOMER	1953 AKDT MAR 27		Less than 1 FT	
CRAIG	2011 AKDT MAR 27			
* BRITISH COLUMBIA				
LANGARA	2020 PDT MAR 27		Less than 1 FT	0.5FT
TOFINO	2136 PDT MAR 27	9 HRS	2.2FT +/- 0.7	
* OREGON				
CHARLESTON	2140 PDT MAR 27	6 HRS	1.3FT +/- 0.4	
SEASIDE	2155 PDT MAR 27	15 HRS	3.3FT +/- 1.0	
* CALIFORNIA				
CRESCENT CITY	2145 PDT MAR 27	21 HRS	4.8FT +/- 1.4	
SAN FRANCISCO	2215 PDT MAR 27	6 HRS	1.5FT +/- 0.5	
SANTA BARBARA	2223 PDT MAR 27		Less than 1 FT	
SAN PEDRO	2237 PDT MAR 27	6 HRS	1.1FT +/- 0.3	
LA JOLLA	2245 PDT MAR 27	9 HRS	1.9FT +/- 0.6	
* WASHINGTON				
NEAH BAY	2146 PDT MAR 27		Less than 1 FT	
WESTPORT	2156 PDT MAR 27	6 HRS	1.3FT +/- 0.4	

NIKOLSKI ALASKA HAS REPORTED SOME FLOODING ALONG BEACHMASTER STREET FROM A 1.2-FOOT TIDAL SURGE. BUILDINGS SEAWARD OF BEACHMASTER STREET WERE FLOODED BUT IT IS BELIEVE THAT MINIMAL DAMAGE OCCURED. A 0.5-FOOT TIDAL SURGE WAS NOTED IN LANGARA BRITISH COLUMBIA. THE WATER DID NOT CAUSE ANY DAMAGE BECAUSE OF THE SHOALS SEAWARD OF SW MARINE DRIVE.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
HONOLULU HI	0108 UTC 3-28	1.14 FT
SHEMYA AK	0109 UTC 3-28	1.35 FT
KAWAIHAE HI	0128 UTC 3-28	4.33 FT
KAHULUI HI	0135 UTC 3-28	6.96 FT
DUTCH HARBOR AK	0142 UTC 3-28	0.52 FT
HILO HI	0146 UTC 3-28	2.30 FT
WEST ATKA AK	0148 UTC 3-28	1.54 FT
SAND POINT AK	0224 UTC 3-28	0.30 FT
AKUTAN ISLAND AK	0240 UTC 3-28	0.89 FT
COLD BAY AK	0254 UTC 3-28	0.33 FT
KODIAK AK	0316 UTC 3-28	0.16 FT
NIKOLSKI AK	0322 UTC 3-28	1.15 FT
SEWARD AK	0348 UTC 3-28	0.23 FT
ELFIN COVE AK	0351 UTC 3-28	0.39 FT
LANGARA TG BC	0355 UTC 3-28	0.46 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 9.0
- \* ORIGIN TIME 1000 AKDT MAR 27 2013  
1100 PDT MAR 27 2013  
1800 UTC MAR 27 2013
- \* COORDINATES 20.2 NORTH 146.8 EAST
- \* DEPTH 19 MILES
- \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
- \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
- \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT PTWC.WEATHER.GOV.

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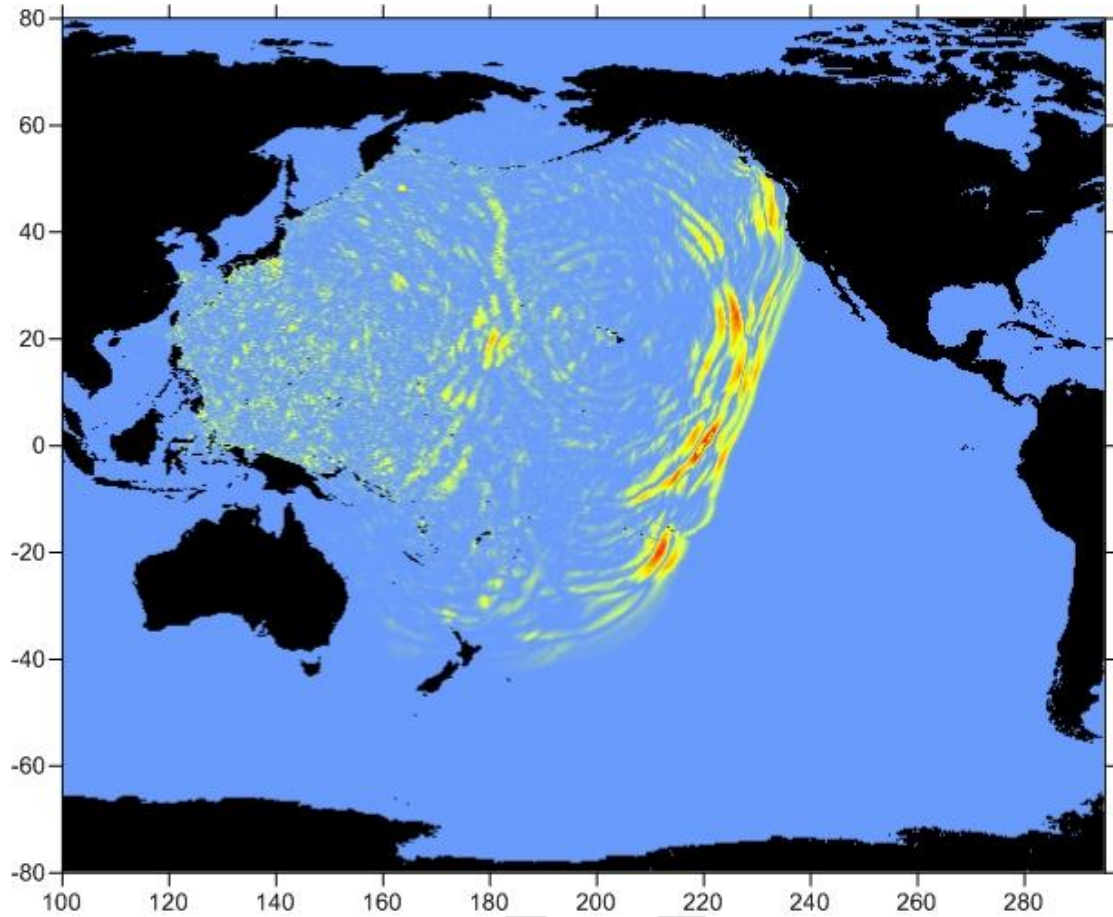


Figure D5. Snapshot of tsunami at time WCATWC bulletin 12 is issued.

**WCATWC Message #12**

WEAK51 PAAQ 280502  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 12  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
1002 PM PDT WED MAR 27 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY  
REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT  
CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO  
BORDER TO POINT CONCEPTION CALIFORNIA



- \* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.
- \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
- \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI ARRIVAL.
- \* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT EXPECTED FOR ADVISORY AREAS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	1.4FT
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	0.5FT
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	0.3FT
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	0.3FT
KODIAK	1836 AKDT MAR 27		Less than 1 FT	0.2FT
SEWARD	1901 AKDT MAR 27		Less than 1 FT	0.2FT
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	0.4FT
YAKUTAT	1910 AKDT MAR 27	6 HRS	1.2FT +/- 0.4	0.4FT
SITKA	1910 AKDT MAR 27	12 HRS	2.9FT +/- 0.9	0.1FT
VALDEZ	1920 AKDT MAR 27		Less than 1 FT	
CORDOVA	1930 AKDT MAR 27		Less than 1 FT	0.2FT
HOMER	1953 AKDT MAR 27		Less than 1 FT	
CRAIG	2011 AKDT MAR 27			

* BRITISH COLUMBIA				
LANGARA	2020 PDT MAR 27		Less than 1 FT	0.5FT
TOFINO	2136 PDT MAR 27	9 HRS	2.2FT +/- 0.7	

- \* OREGON

CHARLESTON 2140 PDT MAR 27 6 HRS 1.3FT +/- 0.4  
 SEASIDE 2155 PDT MAR 27 15 HRS 3.3FT +/- 1.0

\* CALIFORNIA

CRESCENT CITY 2145 PDT MAR 27 21 HRS 4.8FT +/- 1.4  
 SAN FRANCISCO 2215 PDT MAR 27 6 HRS 1.5FT +/- 0.5  
 SANTA BARBARA 2223 PDT MAR 27 Less than 1 FT  
 SAN PEDRO 2237 PDT MAR 27 6 HRS 1.1FT +/- 0.3  
 LA JOLLA 2245 PDT MAR 27 9 HRS 1.9FT +/- 0.6

\* WASHINGTON

NEAH BAY 2146 PDT MAR 27 Less than 1 FT  
 WESTPORT 2156 PDT MAR 27 6 HRS 1.3FT +/- 0.4

A 1.4-FOOT TIDAL SURGE WAS REPORTED IN AKUTAN ALASKA. IT REPORTLY FLOODED PORTIONS OF THE BOARDWAY AND KILLED ONE PERSON WHEN THE BOAT THEY WERE IN WAS FLIPPED OVER BY THE WAVE. DUTCH HARBOR ALASKA ALSO REPORTED A 1.4-FOOT TIDAL SURGE, BUT ACCURED NO DAMAGE. SOUTH SPIT CALIFORNIA REPORTED A 1.2-FOOT TIDAL SURGE THAT FLOODED A PORTION OF HIGHWAY 255 CLOSING EUREKA MUNICIPAL AIRPORT UNTIL FURTHER NOTICE.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
SAND POINT AK	0224 UTC 3-28	0.30 FT
AKUTAN ISLAND AK	0240 UTC 3-28	0.89 FT
COLD BAY AK	0254 UTC 3-28	0.33 FT
KODIAK AK	0316 UTC 3-28	0.16 FT
NIKOLSKI AK	0322 UTC 3-28	1.15 FT
KING COVE AK	0344 UTC 3-28	0.43 FT
SEWARD AK	0348 UTC 3-28	0.23 FT
ELFIN COVE AK	0351 UTC 3-28	0.39 FT
LANGARA TG BC	0355 UTC 3-28	0.46 FT
CORDOVA AK	0414 UTC 3-28	0.16 FT
YAKUTAT TG AK	0418 UTC 3-28	0.36 FT
SITKA DOCK TG AK	0418 UTC 3-28	0.09 FT
SELDOVIA AK	0432 UTC 3-28	0.08 FT
AKUTAN ISLAND AK	0441 UTC 3-28	1.35 FT
HOMER AK	0442 UTC 3-28	0.07 FT
DUTCH HARBOR AK	0444 UTC 3-28	1.41 FT
WHITTIER AK	0447 UTC 3-28	0.10 FT
EUREKA CA	0456 UTC 3-28	0.94 FT
SOUTH SPIT CA	0458 UTC 3-28	1.17 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

\* MAGNITUDE 9.0  
 \* ORIGIN TIME 1000 AKDT MAR 27 2013  
 1100 PDT MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- 
- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
  - \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
  - \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT PTWC.WEATHER.GOV.

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**WCATWC Message #13**

WEAK51 PAAQ 280602  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 13  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
1102 PM PDT WED MAR 27 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO POINT CONCEPTION CALIFORNIA
- \* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- 
- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.
  - \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.
  - \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- 
- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
  - \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI ARRIVAL.

\* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS

- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT EXPECTED FOR ADVISORY AREAS.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	1.4FT
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	1.4FT
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	0.5FT
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	0.4FT
KODIAK	1836 AKDT MAR 27		Less than 1 FT	0.4FT
SEWARD	1901 AKDT MAR 27		Less than 1 FT	0.3FT
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	0.8FT
YAKUTAT	1910 AKDT MAR 27	6 HRS	1.2FT +/- 0.4	0.4FT
SITKA	1910 AKDT MAR 27	12 HRS	2.9FT +/- 0.9	0.1FT
VALDEZ	1920 AKDT MAR 27		Less than 1 FT	
CORDOVA	1930 AKDT MAR 27		Less than 1 FT	2.8FT
HOMER	1953 AKDT MAR 27		Less than 1 FT	0.1FT
CRAIG	2011 AKDT MAR 27			
* BRITISH COLUMBIA				
LANGARA	2020 PDT MAR 27		Less than 1 FT	0.8FT
TOFINO	2136 PDT MAR 27	9 HRS	2.2FT +/- 0.7	1.4FT
* OREGON				
CHARLESTON	2140 PDT MAR 27	6 HRS	1.3FT +/- 0.4	2.2FT
SEASIDE	2155 PDT MAR 27	15 HRS	3.3FT +/- 1.0	
* CALIFORNIA				
CRESCENT CITY	2145 PDT MAR 27	21 HRS	4.8FT +/- 1.4	1.2FT
SAN FRANCISCO	2215 PDT MAR 27	6 HRS	1.5FT +/- 0.5	
SANTA BARBARA	2223 PDT MAR 27		Less than 1 FT	0.5FT
SAN PEDRO	2237 PDT MAR 27	6 HRS	1.1FT +/- 0.3	
LA JOLLA	2245 PDT MAR 27	9 HRS	1.9FT +/- 0.6	
* WASHINGTON				
NEAH BAY	2146 PDT MAR 27		Less than 1 FT	0.5FT
WESTPORT	2156 PDT MAR 27	6 HRS	1.3FT +/- 0.4	0.9FT

CORDOVA ALASKA REPORTED A 2.9-FOOT TIDAL SURGE THAT CAUSED SMALL BOAT DAMAGE IN THE HARBOR. LARGE WAVES WERE NOTED NEAR BOSWELL BAY BEACHES STATE MARINE PARK. PORTIONS OF DOCK ROAD IN PORT ORFORD OREGON FLOODED WHEN A 2.8-FOOT TIDAL SURGE CAME ASHORE. ONE PERSON WAS INJURED WHEN THE SURGE KNOCKED HIM ONTO THE ROCKS ON WHICH HE STOOD. A 2.2-FOOT TIDAL SURGE WENT ASHORE IN CHARLESTON OREGON AND CAUSED MUCH DAMAGE TO SMALL BOATS NEAR THE ALASKA PACKERS ROAD.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
NIKOLSKI AK	0322 UTC 3-28	1.15 FT
KING COVE AK	0344 UTC 3-28	0.43 FT
YAKUTAT TG AK	0418 UTC 3-28	0.36 FT
SELDOVIA AK	0432 UTC 3-28	0.08 FT
AKUTAN ISLAND AK	0441 UTC 3-28	1.35 FT
HOMER AK	0442 UTC 3-28	0.07 FT
WHITTIER AK	0447 UTC 3-28	0.10 FT
EUREKA CA	0456 UTC 3-28	0.94 FT
CRESCENT CITY TG CA	0506 UTC 3-28	1.16 FT
MONTEREY CA	0508 UTC 3-28	0.69 FT
SAND POINT AK	0508 UTC 3-28	0.49 FT
SANTA CRUZ CA	0509 UTC 3-28	0.75 FT
LANGARA TG BC	0510 UTC 3-28	0.75 FT
CRESCENT CITY CA	0511 UTC 3-28	1.24 FT
TOFINO BC	0512 UTC 3-28	1.38 FT
TRINIDAD CA	0512 UTC 3-28	1.61 FT
ELFIN COVE AK	0513 UTC 3-28	0.85 FT
LONG BEACH WA	0518 UTC 3-28	1.20 FT
POINT REYES TG CA	0518 UTC 3-28	0.88 FT
SEWARD AK	0518 UTC 3-28	0.30 FT
NEAH BAY TG WA	0521 UTC 3-28	0.50 FT
COLD BAY AK	0531 UTC 3-28	0.43 FT
WESTPORT WA	0531 UTC 3-28	0.90 FT
PORT SAN LUIS CA	0534 UTC 3-28	0.71 FT
CORDOVA AK	0540 UTC 3-28	2.85 FT
SITKA DOCK TG AK	0542 UTC 3-28	0.10 FT
PORT ORFORD OR	0548 UTC 3-28	2.82 FT
DUTCH HARBOR AK	0550 UTC 3-28	1.44 FT
SANTA BARBARA CA	0550 UTC 3-28	0.45 FT
SOUTH SPIT CA	0551 UTC 3-28	4.13 FT
KODIAK AK	0553 UTC 3-28	0.39 FT
CHARLESTON OR	0557 UTC 3-28	2.20 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 9.0
- \* ORIGIN TIME 1000 AKDT MAR 27 2013  
1100 PDT MAR 27 2013  
1800 UTC MAR 27 2013
- \* COORDINATES 20.2 NORTH 146.8 EAST
- \* DEPTH 19 MILES
- \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
- \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
- \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON...

WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE  
PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS  
EVENT AT PTWC.WEATHER.GOV.

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**WCATWC Message #14**

WEAK51 PAAQ 280702  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 14  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
1202 AM PDT THU MAR 28 2013

TSUNAMI OBSERVATIONS ARE UPDATED IN THIS MESSAGE. THE WARNING AND ADVISORY  
REGIONS ARE THE SAME.

...THE TSUNAMI WARNING REMAINS IN EFFECT...

...THE TSUNAMI ADVISORY REMAINS IN EFFECT...

WARNINGS/ADVISORIES/WATCHES

-----  
TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT  
CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER

TSUNAMI ADVISORY IN EFFECT FOR...

- \* THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO  
BORDER TO POINT CONCEPTION CALIFORNIA
- \* THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND  
ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS FOR TSUNAMI WARNING AREAS

- 
- \* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS  
EXPECTED.
  - \* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL  
CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER  
TSUNAMI ARRIVAL.
  - \* THE FIRST WAVE MAY NOT BE THE LARGEST.

IMPACTS FOR TSUNAMI ADVISORY AREAS

- 
- \* A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS  
TO PERSONS IN OR VERY NEAR THE WATER IS EXPECTED.
  - \* CURRENTS MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL  
STRUCTURES AND MAY CONTINUE FOR MANY HOURS AFTER THE TSUNAMI  
ARRIVAL.
  - \* THE FIRST WAVE MAY NOT BE THE LARGEST.

RECOMMENDED ACTIONS

- 
- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
  - \* IF YOU ARE IN AN ADVISORY AREA - MOVE OFF THE BEACH AND OUT OF  
HARBORS AND MARINAS. WIDESPREAD INUNDATION OF LAND IS NOT  
EXPECTED FOR ADVISORY AREAS.

- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.
- \* DO NOT GO TO THE COAST TO OBSERVE THE TSUNAMI.
- \* DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED TSUNAMI HEIGHT
* ALASKA				
SHEMYA	1517 AKDT MAR 27	9 HRS	1.8FT +/- 0.6	1.4FT
ADAK	1557 AKDT MAR 27	6 HRS	1.5FT +/- 0.5	
DUTCH HARBOR	1706 AKDT MAR 27	6 HRS	1.1FT +/- 0.3	1.4FT
SAND POINT	1742 AKDT MAR 27		Less than 1 FT	0.9FT
COLD BAY	1814 AKDT MAR 27		Less than 1 FT	0.4FT
KODIAK	1836 AKDT MAR 27		Less than 1 FT	0.4FT
SEWARD	1901 AKDT MAR 27		Less than 1 FT	0.3FT
ELFIN COVE	1903 AKDT MAR 27		Less than 1 FT	0.8FT
YAKUTAT	1910 AKDT MAR 27	6 HRS	1.2FT +/- 0.4	0.4FT
SITKA	1910 AKDT MAR 27	12 HRS	2.9FT +/- 0.9	0.1FT
VALDEZ	1920 AKDT MAR 27		Less than 1 FT	
CORDOVA	1930 AKDT MAR 27		Less than 1 FT	0.2FT
HOMER	1953 AKDT MAR 27		Less than 1 FT	0.1FT
CRAIG	2011 AKDT MAR 27			
* BRITISH COLUMBIA				
LANGARA	2020 PDT MAR 27		Less than 1 FT	0.8FT
TOFINO	2136 PDT MAR 27	9 HRS	2.2FT +/- 0.7	2.6FT
* OREGON				
CHARLESTON	2140 PDT MAR 27	6 HRS	1.3FT +/- 0.4	2.2FT
SEASIDE	2155 PDT MAR 27	15 HRS	3.3FT +/- 1.0	
* CALIFORNIA				
CRESCENT CITY	2145 PDT MAR 27	21 HRS	4.8FT +/- 1.4	2.4FT
SAN FRANCISCO	2215 PDT MAR 27	6 HRS	1.5FT +/- 0.5	
SANTA BARBARA	2223 PDT MAR 27		Less than 1 FT	0.5FT
SAN PEDRO	2237 PDT MAR 27	6 HRS	1.1FT +/- 0.3	
LA JOLLA	2245 PDT MAR 27	9 HRS	1.9FT +/- 0.6	0.5FT
* WASHINGTON				
NEAH BAY	2146 PDT MAR 27		Less than 1 FT	0.5FT
WESTPORT	2156 PDT MAR 27	6 HRS	1.3FT +/- 0.4	0.9FT

TRINIDAD CALIFORNIA REPORTED A 4.4-FOOT TIDAL SURGE WHICH FLOODED THE BUILDINGS NEAR THE CITY PIER. A PORTION OF BAY STREET LOCATED NEAR THE SHORE WAS ALSO FLOODED. CRESCENT CITY CALIFORNIA REPORTED A 2.4-FOOT TIDAL SURGE WHICH INUNDATED PORTIONS OF BOTH A AND B STREETS. BATTERY STREET WAS ALSO FLOODED AND SMALL BOAT DAMAGE WAS REPORTED IN THE CRESCENT CITY SMALL BOAT HARBOR. TWO PEOPLE WERE INJURED IN THE HARBOR WHEN THE TIDAL SURGE PINNED THEIR LEGS BETWEEN A BOAT AND THE DOCK.

FORECAST MAX TSUNAMI HEIGHT IS THE HIGHEST EXPECTED WATER LEVEL ABOVE THE TIDE.

FORECAST TSUNAMI DURATION IS THE APPROXIMATE LENGTH OF TIME WHICH THE TSUNAMI MAY PRODUCE DANGEROUS CURRENTS AND WAVE ACTIVITY.

OBSERVED TSUNAMI HEIGHT IS THE HIGHEST WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
YAKUTAT TG AK	0418 UTC 3-28	0.36 FT
SELDOVIA AK	0432 UTC 3-28	0.08 FT
AKUTAN ISLAND AK	0441 UTC 3-28	1.35 FT
HOMER AK	0442 UTC 3-28	0.07 FT
WHITTIER AK	0447 UTC 3-28	0.10 FT
EUREKA CA	0456 UTC 3-28	0.94 FT
MONTEREY CA	0508 UTC 3-28	0.69 FT
SANTA CRUZ CA	0509 UTC 3-28	0.75 FT
LANGARA TG BC	0510 UTC 3-28	0.75 FT
TRINIDAD CA	0512 UTC 3-28	1.61 FT
ELFIN COVE AK	0513 UTC 3-28	0.85 FT
LONG BEACH WA	0518 UTC 3-28	1.20 FT
POINT REYES TG CA	0518 UTC 3-28	0.88 FT
SEWARD AK	0518 UTC 3-28	0.30 FT
NEAH BAY TG WA	0521 UTC 3-28	0.50 FT
COLD BAY AK	0531 UTC 3-28	0.43 FT
WESTPORT WA	0531 UTC 3-28	0.90 FT
CORDOVA AK	0540 UTC 3-28	2.85 FT
SITKA DOCK TG AK	0542 UTC 3-28	0.10 FT
PORT ORFORD OR	0548 UTC 3-28	2.82 FT
DUTCH HARBOR AK	0550 UTC 3-28	1.44 FT
SANTA BARBARA CA	0550 UTC 3-28	0.45 FT
SOUTH SPIT CA	0551 UTC 3-28	4.13 FT
KODIAK AK	0553 UTC 3-28	0.39 FT
CHARLESTON OR	0557 UTC 3-28	2.20 FT
MONTEREY CA	0600 UTC 3-28	0.92 FT
ASTORIA TG OR	0605 UTC 3-28	0.39 FT
PORT ANGELES TG WA	0606 UTC 3-28	0.43 FT
TRINIDAD CA	0606 UTC 3-28	4.36 FT
LA HARBOR CA	0608 UTC 3-28	0.31 FT
LA JOLLA CA	0612 UTC 3-28	0.53 FT
TOFINO BC	0612 UTC 3-28	2.56 FT
KING COVE AK	0618 UTC 3-28	0.82 FT
SAN DIEGO NAVAL PIER CA	0623 UTC 3-28	0.73 FT
CRESCENT CITY TG CA	0636 UTC 3-28	2.43 FT
CRESCENT CITY CA	0636 UTC 3-28	2.36 FT
PORT SAN LUIS CA	0636 UTC 3-28	2.17 FT
SAND POINT AK	0638 UTC 3-28	0.92 FT
SANTA MONICA TG CA	0647 UTC 3-28	0.75 FT
PORT TOWNSEND WA	0653 UTC 3-28	0.39 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

PRELIMINARY EARTHQUAKE PARAMETERS

- \* MAGNITUDE 9.0
- \* ORIGIN TIME 1000 AKDT MAR 27 2013  
1100 PDT MAR 27 2013  
1800 UTC MAR 27 2013
- \* COORDINATES 20.2 NORTH 146.8 EAST
- \* DEPTH 19 MILES
- \* LOCATION MARIANA ISLANDS REGION

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.
- \* REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.
- \* PACIFIC COASTAL RESIDENTS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE



PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS  
EVENT AT PTWC.WEATHER.GOV.

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**WCATWC Message #15**

WEAK51 PAAQ 280802  
TSUAK1

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 15  
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK  
102 AM PDT THU MAR 28 2013

...THE TSUNAMI WARNING AND ADVISORY ARE CANCELLED...

CANCELLATIONS

- \* THE TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO POINT CONCEPTION CALIFORNIA
- \* THE TSUNAMI WARNING IS CANCELED FOR THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM POINT CONCEPTION CALIFORNIA TO THE OREGON-WASHINGTON BORDER
- \* THE TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS OF WASHINGTON - BRITISH COLUMBIA AND ALASKA FROM THE OREGON-WASHINGTON BORDER TO ATTU ALASKA

IMPACTS - UPDATED

- \* TSUNAMI ACTIVITY HAS SUBSIDED ALONG THE COASTS OF THE U.S. WEST COAST STATES... BRITISH COLUMBIA AND ALASKA.
- \* ONGOING ACTIVITY MAY PERSIST IN SOME AREAS CAUSING STRONG CURRENTS DANGEROUS TO SWIMMERS AND BOATS.
- \* THE DETERMINATION TO RE-OCCUPY HAZARD ZONES MUST BE MADE BY LOCAL OFFICIALS.

RECOMMENDED ACTIONS - UPDATED

- \* DO NOT RE-OCCUPY HAZARD ZONES UNTIL LOCAL EMERGENCY OFFICIALS INDICATE IT IS SAFE TO DO SO.

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
MONTEREY CA	0508 UTC 3-28	0.69 FT
SANTA CRUZ CA	0509 UTC 3-28	0.75 FT
LANGARA TG BC	0510 UTC 3-28	0.75 FT
TOFINO BC	0512 UTC 3-28	1.38 FT
TRINIDAD CA	0512 UTC 3-28	1.61 FT
ELFIN COVE AK	0513 UTC 3-28	0.85 FT
LONG BEACH WA	0518 UTC 3-28	1.20 FT
POINT REYES TG CA	0518 UTC 3-28	0.88 FT
SEWARD AK	0518 UTC 3-28	0.30 FT
NEAH BAY TG WA	0521 UTC 3-28	0.50 FT
COLD BAY AK	0531 UTC 3-28	0.43 FT
WESTPORT WA	0531 UTC 3-28	0.90 FT
CORDOVA AK	0540 UTC 3-28	2.85 FT
SITKA DOCK TG AK	0542 UTC 3-28	0.10 FT
PORT ORFORD OR	0548 UTC 3-28	2.82 FT

DUTCH HARBOR AK	0550	UTC	3-28	1.44	FT
SANTA BARBARA CA	0550	UTC	3-28	0.45	FT
SOUTH SPIT CA	0551	UTC	3-28	4.13	FT
KODIAK AK	0553	UTC	3-28	0.39	FT
CHARLESTON OR	0557	UTC	3-28	2.20	FT
MONTEREY CA	0600	UTC	3-28	0.92	FT
ASTORIA TG OR	0605	UTC	3-28	0.39	FT
PORT ANGELES TG WA	0606	UTC	3-28	0.43	FT
TRINIDAD CA	0606	UTC	3-28	4.36	FT
LA HARBOR CA	0608	UTC	3-28	0.31	FT
LA JOLLA CA	0612	UTC	3-28	0.53	FT
TOFINO BC	0612	UTC	3-28	2.56	FT
KING COVE AK	0618	UTC	3-28	0.82	FT
SAN DIEGO NAVAL PIER CA	0623	UTC	3-28	0.73	FT
CRESCENT CITY TG CA	0636	UTC	3-28	2.43	FT
CRESCENT CITY CA	0636	UTC	3-28	2.36	FT
PORT SAN LUIS CA	0636	UTC	3-28	2.17	FT
SAND POINT AK	0638	UTC	3-28	0.92	FT
SANTA MONICA TG CA	0647	UTC	3-28	0.75	FT
PORT TOWNSEND WA	0653	UTC	3-28	0.39	FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

NEXT UPDATE AND ADDITIONAL INFORMATION

- 
- \* THIS WILL BE THE LAST WEST COAST/ALASKA TSUNAMI WARNING CENTER BULLETIN ISSUED FOR THIS EVENT.
  - \* REFER TO THE INTERNET SITE [WCATWC.ARH.NOAA.GOV](http://WCATWC.ARH.NOAA.GOV) FOR MORE INFORMATION.
  - \* PACIFIC COASTAL REGIONS OUTSIDE CALIFORNIA... OREGON... WASHINGTON... BRITISH COLUMBIA AND ALASKA SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV).

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**PTWC Pacific Messages**

**PTWC Pacific Message #1**

WEPA40 PHEB 271805  
 TSUPAC

TSUNAMI BULLETIN NUMBER 1  
 PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
 ISSUED AT 1805Z 27 MAR 2013

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  
 N. MARIANAS - MARCUS IS. - GUAM - YAP - JAPAN - POHNPEI -  
 CHUUK - MARSHALL IS. - PALAU - WAKE IS. AND KOSRAE.

A TSUNAMI WATCH IS IN EFFECT FOR  
 PAPUA NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN -  
 RUSSIA - NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. -  
 HOWLAND-BAKER - TUVALU - JOHNSTON IS. - VANUATU AND 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.

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE      8.3
* ORIGIN TIME    1800 UTC MAR 27 2013
* COORDINATES    20.2 NORTH 146.8 EAST
* DEPTH          19 MILES
* LOCATION       MARIANA ISLANDS REGION
    
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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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1844Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1904Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1906Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1956Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1956Z 27 MAR
	SHIMIZU	32.8N 133.0E	2044Z 27 MAR

	KUSHIRO	42.9N 144.3E	2054Z	27	MAR
	HACHINOHE	40.5N 141.5E	2111Z	27	MAR
	OKINAWA	26.2N 127.8E	2126Z	27	MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2011Z	27	MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2019Z	27	MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2021Z	27	MAR
	KWAJALEIN	8.7N 167.7E	2106Z	27	MAR
	MAJURO	7.1N 171.4E	2141Z	27	MAR
PALAU	MALAKAL	7.3N 134.5E	2029Z	27	MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2030Z	27	MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2046Z	27	MAR
PAPUA NEW GUINEA	MANUS IS.	2.0S 147.5E	2113Z	27	MAR
	KAVIENG	2.5S 150.7E	2113Z	27	MAR
	VANIMO	2.6S 141.3E	2125Z	27	MAR
	RABAU	4.2S 152.3E	2133Z	27	MAR
	WEWAK	3.5S 143.6E	2140Z	27	MAR
	KIETA	6.1S 155.6E	2153Z	27	MAR
	AMUN	6.0S 154.7E	2157Z	27	MAR
	MADANG	5.2S 145.8E	2159Z	27	MAR
	LAE	6.8S 147.0E	2235Z	27	MAR
	PORT MORESBY	9.3S 146.9E	0010Z	28	MAR
INDONESIA	WARSA	0.6S 135.8E	2118Z	27	MAR
	MANOKWARI	0.8S 134.2E	2123Z	27	MAR
	JAYAPURA	2.4S 140.8E	2127Z	27	MAR
	BEREBERE	2.5N 128.7E	2133Z	27	MAR
	GEME	4.6N 126.8E	2135Z	27	MAR
	SORONG	0.8S 131.1E	2140Z	27	MAR
	PATANI	0.4N 128.8E	2202Z	27	MAR
PHILIPPINES	PALANAN	17.1N 122.6E	2119Z	27	MAR
	LEGASPI	13.2N 123.8E	2142Z	27	MAR
	DAVAO	6.8N 125.7E	2143Z	27	MAR
TAIWAN	HUALIEN	24.0N 121.6E	2124Z	27	MAR
RUSSIA	URUP IS	46.1N 150.5E	2126Z	27	MAR
	PETROPAVLOVSK K	53.2N 159.6E	2235Z	27	MAR
	SEVERO KURILSK	50.8N 156.1E	2245Z	27	MAR
	UST KAMCHATSK	56.1N 162.6E	2257Z	27	MAR
	MEDNNY IS	54.7N 167.4E	2259Z	27	MAR
NAURU	NAURU	0.5S 166.9E	2150Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S 155.6E	2206Z	27	MAR
	PANGGOE	6.9S 157.2E	2210Z	27	MAR
	MUNDA	8.4S 157.2E	2223Z	27	MAR
	GHATERE	7.8S 159.2E	2235Z	27	MAR
	AUKI	8.8S 160.6E	2257Z	27	MAR
	HONIARA	9.3S 160.0E	2259Z	27	MAR
	KIRAKIRA	10.4S 161.9E	2313Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N 173.0E	2221Z	27	MAR
	KANTON IS.	2.8S 171.7W	0021Z	28	MAR
	CHRISTMAS IS.	2.0N 157.5W	0139Z	28	MAR
	MALDEN IS.	3.9S 154.9W	0214Z	28	MAR
	FLINT IS.	11.4S 151.8W	0308Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	2230Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N 176.6W	2329Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S 178.5E	2342Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	2344Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S 167.3E	0003Z	28	MAR
	ANATOM IS.	20.2S 169.9E	0056Z	28	MAR
HAWAII	NAWILIWILI	22.0N 159.4W	0056Z	28	MAR
	HONOLULU	21.3N 157.9W	0108Z	28	MAR
	HILO	19.7N 155.1W	0146Z	28	MAR

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... AND  
CALIFORNIA.

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**PTWC Pacific Message #2**

WEPA40 PHEB 271904  
TSUPAC

TSUNAMI BULLETIN NUMBER 2  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 1904Z 27 MAR 2013

THE EARTHQUAKE MAGNITUDE HAS INCREASED TO 8.8.

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  
N. MARIANAS - GUAM - MARCUS IS. - JAPAN - YAP - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU AND SOLOMON IS..

A TSUNAMI WATCH IS IN EFFECT FOR  
KIRIBATI - MIDWAY IS. - HOWLAND-BAKER - TUVALU - JOHNSTON  
IS. - VANUATU - TOKELAU - HONG KONG - PALMYRA IS. -  
WALLIS-FUTUNA AND HAWAII.

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PRELIMINARY EARTHQUAKE PARAMETERS

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\* MAGNITUDE 8.8  
\* ORIGIN TIME 1800 UTC MAR 27 2013  
\* COORDINATES 20.2 NORTH 146.8 EAST  
\* DEPTH 19 MILES  
\* LOCATION MARIANA ISLANDS REGION

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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
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N. MARIANAS	SAIPAN	15.3N 145.8E	1838Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1859Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1904Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1950Z 27 MAR

	SHIMIZU	32.8N 133.0E	2038Z	27	MAR
	KUSHIRO	42.9N 144.3E	2048Z	27	MAR
	HACHINOHE	40.5N 141.5E	2105Z	27	MAR
	OKINAWA	26.2N 127.8E	2120Z	27	MAR
YAP	YAP IS.	9.5N 138.1E	1950Z	27	MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2005Z	27	MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2012Z	27	MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2015Z	27	MAR
	KWAJALEIN	8.7N 167.7E	2100Z	27	MAR
	MAJURO	7.1N 171.4E	2136Z	27	MAR
PALAU	MALAKAL	7.3N 134.5E	2023Z	27	MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z	27	MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2039Z	27	MAR
PAPUA NEW GUINEA	MANUS IS.	2.0S 147.5E	2107Z	27	MAR
	KAVIENG	2.5S 150.7E	2107Z	27	MAR
	VANIMO	2.6S 141.3E	2119Z	27	MAR
	RABAU	4.2S 152.3E	2126Z	27	MAR
	WEWAK	3.5S 143.6E	2133Z	27	MAR
	KIETA	6.1S 155.6E	2147Z	27	MAR
	AMUN	6.0S 154.7E	2151Z	27	MAR
	MADANG	5.2S 145.8E	2153Z	27	MAR
	LAE	6.8S 147.0E	2228Z	27	MAR
	PORT MORESBY	9.3S 146.9E	0003Z	28	MAR
INDONESIA	WARSA	0.6S 135.8E	2111Z	27	MAR
	MANOKWARI	0.8S 134.2E	2117Z	27	MAR
	JAYAPURA	2.4S 140.8E	2120Z	27	MAR
	BEREBERE	2.5N 128.7E	2126Z	27	MAR
	GEME	4.6N 126.8E	2130Z	27	MAR
	SORONG	0.8S 131.1E	2134Z	27	MAR
	PATANI	0.4N 128.8E	2155Z	27	MAR
PHILIPPINES	PALANAN	17.1N 122.6E	2115Z	27	MAR
	DAVAO	6.8N 125.7E	2139Z	27	MAR
	LEGASPI	13.2N 123.8E	2139Z	27	MAR
TAIWAN	HUALIEN	24.0N 121.6E	2119Z	27	MAR
RUSSIA	URUP IS	46.1N 150.5E	2120Z	27	MAR
	PETROPAVLOVSK K	53.2N 159.6E	2230Z	27	MAR
	SEVERO KURILSK	50.8N 156.1E	2240Z	27	MAR
	UST KAMCHATSK	56.1N 162.6E	2252Z	27	MAR
	MEDNNY IS	54.7N 167.4E	2254Z	27	MAR
NAURU	NAURU	0.5S 166.9E	2143Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S 155.6E	2200Z	27	MAR
	PANGGOE	6.9S 157.2E	2203Z	27	MAR
	MUNDA	8.4S 157.2E	2217Z	27	MAR
	GHATERE	7.8S 159.2E	2228Z	27	MAR
	AUKI	8.8S 160.6E	2250Z	27	MAR
	HONIARA	9.3S 160.0E	2252Z	27	MAR
	KIRAKIRA	10.4S 161.9E	2307Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N 173.0E	2215Z	27	MAR
	KANTON IS.	2.8S 171.7W	0018Z	28	MAR
	CHRISTMAS IS.	2.0N 157.5W	0137Z	28	MAR
	MALDEN IS.	3.9S 154.9W	0211Z	28	MAR
	FLINT IS.	11.4S 151.8W	0306Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N 176.6W	2326Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S 178.5E	2336Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	2342Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S 167.3E	2356Z	27	MAR
	ANATOM IS.	20.2S 169.9E	0049Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S 171.8W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N 114.2E	0044Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N 162.4W	0045Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S 176.3W	0045Z	28	MAR
HAWAII	NAWILIWILI	22.0N 159.4W	0056Z	28	MAR
	HONOLULU	21.3N 157.9W	0108Z	28	MAR
	HILO	19.7N 155.1W	0146Z	28	MAR

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... AND CALIFORNIA.

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**PTWC Pacific Message #3**

WEPA40 PHEB 272004  
TSUPAC

TSUNAMI BULLETIN NUMBER 3  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 2004Z 27 MAR 2013

THE EARTHQUAKE MAGNITUDE HAS INCREASED TO 9.0.

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  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU - SOLOMON IS. - KIRIBATI AND MIDWAY IS..

A TSUNAMI WATCH IS IN EFFECT FOR  
HOWLAND-BAKER - TUVALU - JOHNSTON IS. - VANUATU - TOKELAU -  
WALLIS-FUTUNA - HONG KONG - PALMYRA IS. - AUSTRALIA - SAMOA  
- JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE  
AND HAWAII.

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PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE          9.0
* ORIGIN TIME        1800 UTC MAR 27 2013
* COORDINATES        20.2 NORTH 146.8 EAST
* DEPTH              19 MILES
* LOCATION            MARIANA ISLANDS REGION
    
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OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
GUAM	1856 UTC 3-27	0.81 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

DEEP OCEAN PRESSURE SENSOR DATA INDICATES A TSUNAMI WAS 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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR
	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR
	OKINAWA	26.2N 127.8E	2117Z 27 MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z 27 MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z 27 MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z 27 MAR
	KWAJALEIN	8.7N 167.7E	2057Z 27 MAR
	MAJURO	7.1N 171.4E	2133Z 27 MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z 27 MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z 27 MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z 27 MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z 27 MAR
	MANUS IS.	2.0S 147.5E	2103Z 27 MAR
	VANIMO	2.6S 141.3E	2115Z 27 MAR
	RABAUL	4.2S 152.3E	2122Z 27 MAR
	WEWAK	3.5S 143.6E	2130Z 27 MAR
	KIETA	6.1S 155.6E	2143Z 27 MAR
	AMUN	6.0S 154.7E	2147Z 27 MAR
	MADANG	5.2S 145.8E	2149Z 27 MAR
	LAE	6.8S 147.0E	2225Z 27 MAR
	PORT MORESBY	9.3S 146.9E	0000Z 28 MAR
INDONESIA	WARSA	0.6S 135.8E	2108Z 27 MAR
	MANOKWARI	0.8S 134.2E	2113Z 27 MAR
	JAYAPURA	2.4S 140.8E	2117Z 27 MAR
	BEREBERE	2.5N 128.7E	2123Z 27 MAR
	GEME	4.6N 126.8E	2126Z 27 MAR
	SORONG	0.8S 131.1E	2130Z 27 MAR
	PATANI	0.4N 128.8E	2152Z 27 MAR
PHILIPPINES	PALANAN	17.1N 122.6E	2115Z 27 MAR
	DAVAO	6.8N 125.7E	2135Z 27 MAR
	LEGASPI	13.2N 123.8E	2139Z 27 MAR
TAIWAN	HUALIEN	24.0N 121.6E	2117Z 27 MAR
RUSSIA	URUP IS	46.1N 150.5E	2117Z 27 MAR
	PETROPAVLOVSK K	53.2N 159.6E	2227Z 27 MAR
	SEVERO KURILSK	50.8N 156.1E	2237Z 27 MAR
	UST KAMCHATSK	56.1N 162.6E	2249Z 27 MAR
	MEDNNY IS	54.7N 167.4E	2251Z 27 MAR
NAURU	NAURU	0.5S 166.9E	2140Z 27 MAR
SOLOMON IS.	FALAMAE	7.4S 155.6E	2156Z 27 MAR
	PANGGOE	6.9S 157.2E	2200Z 27 MAR
	MUNDA	8.4S 157.2E	2213Z 27 MAR



	GHATERE	7.8S	159.2E	2225Z	27	MAR
	AUKI	8.8S	160.6E	2247Z	27	MAR
	HONIARA	9.3S	160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S	161.9E	2304Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N	173.0E	2212Z	27	MAR
	KANTON IS.	2.8S	171.7W	0015Z	28	MAR
	CHRISTMAS IS.	2.0N	157.5W	0136Z	28	MAR
	MALDEN IS.	3.9S	154.9W	0210Z	28	MAR
	FLINT IS.	11.4S	151.8W	0303Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N	177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S	178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N	169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S	167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S	169.9E	0046Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S	171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S	176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N	114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N	162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N	159.4W	0056Z	28	MAR
	HONOLULU	21.3N	157.9W	0108Z	28	MAR
	HILO	19.7N	155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S	145.8E	0106Z	28	MAR
	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR

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... AND  
CALIFORNIA.

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**PTWC Pacific Message #4**

WEPA40 PHEB 272103  
TSUPAC

TSUNAMI BULLETIN NUMBER 4  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 2103Z 27 MAR 2013

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

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER

- TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
 - HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -  
 JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE -  
 TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO  
 - PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR -  
 COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR -  
 COLOMBIA AND PERU.

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.

PRELIMINARY EARTHQUAKE PARAMETERS

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 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT			OBSERVED MAX TSUNAMI HEIGHT
GUAM	1856	UTC	3-27	0.81 FT
POHNPEI IS	2002	UTC	3-27	1.56 FT
WAKE IS	2028	UTC	3-27	1.47 FT
KUSHIRO JAPAN	2045	UTC	3-27	0.68 FT
KWAJALEIN	2057	UTC	3-27	0.73 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE  
 TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED  
 WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE  
 PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE  
 TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL  
 DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE  
 LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY  
 SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM  
 ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND  
 THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS  
 WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR

MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z	27	MAR	
YAP	YAP IS.	9.5N 138.1E	1946Z	27	MAR	
JAPAN	KATSUURA	35.1N 140.3E	1947Z	27	MAR	
	SHIMIZU	32.8N 133.0E	2036Z	27	MAR	
	KUSHIRO	42.9N 144.3E	2045Z	27	MAR	
	HACHINOHE	40.5N 141.5E	2102Z	27	MAR	
	OKINAWA	26.2N 127.8E	2117Z	27	MAR	
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z	27	MAR	
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z	27	MAR	
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z	27	MAR	
	KWAJALEIN	8.7N 167.7E	2057Z	27	MAR	
	MAJURO	7.1N 171.4E	2133Z	27	MAR	
PALAU	MALAKAL	7.3N 134.5E	2019Z	27	MAR	
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z	27	MAR	
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z	27	MAR	
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z	27	MAR	
	MANUS IS.	2.0S 147.5E	2103Z	27	MAR	
	VANIMO	2.6S 141.3E	2115Z	27	MAR	
	RABAUL	4.2S 152.3E	2122Z	27	MAR	
	WEWAK	3.5S 143.6E	2130Z	27	MAR	
	KIETA	6.1S 155.6E	2143Z	27	MAR	
	AMUN	6.0S 154.7E	2147Z	27	MAR	
	MADANG	5.2S 145.8E	2149Z	27	MAR	
	LAE	6.8S 147.0E	2225Z	27	MAR	
	PORT MORESBY	9.3S 146.9E	0000Z	28	MAR	
	INDONESIA	WARSA	0.6S 135.8E	2108Z	27	MAR
		MANOKWARI	0.8S 134.2E	2113Z	27	MAR
JAYAPURA		2.4S 140.8E	2117Z	27	MAR	
BEREBERE		2.5N 128.7E	2123Z	27	MAR	
GEME		4.6N 126.8E	2126Z	27	MAR	
SORONG		0.8S 131.1E	2130Z	27	MAR	
PATANI		0.4N 128.8E	2152Z	27	MAR	
PALANAN		17.1N 122.6E	2115Z	27	MAR	
PHILIPPINES	DAVAO	6.8N 125.7E	2135Z	27	MAR	
	LEGASPI	13.2N 123.8E	2139Z	27	MAR	
	HUALIEN	24.0N 121.6E	2117Z	27	MAR	
TAIWAN	URUP IS	46.1N 150.5E	2117Z	27	MAR	
RUSSIA	PETROPAVLOVSK K	53.2N 159.6E	2227Z	27	MAR	
	SEVERO KURILSK	50.8N 156.1E	2237Z	27	MAR	
	UST KAMCHATSK	56.1N 162.6E	2249Z	27	MAR	
	MEDNNY IS	54.7N 167.4E	2251Z	27	MAR	
	NAURU	NAURU	0.5S 166.9E	2140Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S 155.6E	2156Z	27	MAR	
	PANGGOE	6.9S 157.2E	2200Z	27	MAR	
	MUNDA	8.4S 157.2E	2213Z	27	MAR	
	GHATERE	7.8S 159.2E	2225Z	27	MAR	
	AUKI	8.8S 160.6E	2247Z	27	MAR	
	HONIARA	9.3S 160.0E	2249Z	27	MAR	
	KIRAKIRA	10.4S 161.9E	2304Z	27	MAR	
	TARAWA IS.	1.5N 173.0E	2212Z	27	MAR	
KIRIBATI	KANTON IS.	2.8S 171.7W	0015Z	28	MAR	
	CHRISTMAS IS.	2.0N 157.5W	0136Z	28	MAR	
	MALDEN IS.	3.9S 154.9W	0210Z	28	MAR	
	FLINT IS.	11.4S 151.8W	0303Z	28	MAR	
	MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N 176.6W	2323Z	27	MAR	
TUVALU	FUNAFUTI IS.	7.9S 178.5E	2333Z	27	MAR	
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	2341Z	27	MAR	
VANUATU	ESPERITU SANTO	15.1S 167.3E	2353Z	27	MAR	
	ANATOM IS.	20.2S 169.9E	0046Z	28	MAR	
	NUKUNONU IS.	9.2S 171.8W	0039Z	28	MAR	
TOKELAU	WALLIS IS.	13.3S 176.3W	0042Z	28	MAR	
WALLIS-FUTUNA	HONG KONG	22.3N 114.2E	0043Z	28	MAR	
HONG KONG	PALMYRA IS.	6.3N 162.4W	0044Z	28	MAR	
PALMYRA IS.	HAWAII	22.0N 159.4W	0056Z	28	MAR	
HAWAII	NAWILIWILI	22.0N 159.4W	0056Z	28	MAR	
	HONOLULU	21.3N 157.9W	0108Z	28	MAR	
	HILO	19.7N 155.1W	0146Z	28	MAR	
AUSTRALIA	CAIRNS	16.7S 145.8E	0106Z	28	MAR	

	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR
NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR
	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR
	GISBORNE	38.7S	178.0E	0428Z	28	MAR
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR
	NAPIER	39.5S	176.9E	0459Z	28	MAR
	WESTPORT	41.8S	171.6E	0507Z	28	MAR
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR
	BLUFF	46.6S	168.3E	0533Z	28	MAR
	NELSON	41.3S	173.3E	0609Z	28	MAR
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR
FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
	HIVA OA	10.0S	139.0W	0435Z	28	MAR
	RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR
	SOCORRO	18.8N	111.0W	0708Z	28	MAR
	MAZATLAN	23.2N	106.4W	0756Z	28	MAR
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR
PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR
	CORRAL	39.8S	73.5W	1417Z	28	MAR
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR
	ARICA	18.5S	70.3W	1500Z	28	MAR
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR
	CALDERA	27.1S	70.8W	1504Z	28	MAR
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR
GUATEMALA	SIPICATE	13.9N	91.2W	1033Z	28	MAR
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR
	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR
	CORINTO	12.5N	87.2W	1149Z	28	MAR
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR



SITE	OF MEASUREMENT	TSUNAMI HEIGHT
POHNPEI IS	2002 UTC 3-27	1.56 FT
WAKE IS	2028 UTC 3-27	1.47 FT
KUSHIRO JAPAN	2045 UTC 3-27	0.68 FT
KWAJALEIN	2057 UTC 3-27	0.73 FT
RABAU PAPUA NEW GUINEA	2122 UTC 3-27	1.32 FT
MAJUORO MARSHALL IS	2133 UTC 3-27	0.98 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR
	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR
	OKINAWA	26.2N 127.8E	2117Z 27 MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z 27 MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z 27 MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z 27 MAR
	KWAJALEIN	8.7N 167.7E	2057Z 27 MAR
	MAJUORO	7.1N 171.4E	2133Z 27 MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z 27 MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z 27 MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z 27 MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z 27 MAR
	MANUS IS.	2.0S 147.5E	2103Z 27 MAR
	VANIMO	2.6S 141.3E	2115Z 27 MAR
	RABAU	4.2S 152.3E	2122Z 27 MAR
	WEWAK	3.5S 143.6E	2130Z 27 MAR
	KIETA	6.1S 155.6E	2143Z 27 MAR
	AMUN	6.0S 154.7E	2147Z 27 MAR
	MADANG	5.2S 145.8E	2149Z 27 MAR
	LAE	6.8S 147.0E	2225Z 27 MAR

INDONESIA	PORT MORESBY	9.3S	146.9E	0000Z	28	MAR
	WARSA	0.6S	135.8E	2108Z	27	MAR
	MANOKWARI	0.8S	134.2E	2113Z	27	MAR
	JAYAPURA	2.4S	140.8E	2117Z	27	MAR
	BEREBERE	2.5N	128.7E	2123Z	27	MAR
	GEME	4.6N	126.8E	2126Z	27	MAR
	SORONG	0.8S	131.1E	2130Z	27	MAR
PHILIPPINES	PATANI	0.4N	128.8E	2152Z	27	MAR
	PALANAN	17.1N	122.6E	2115Z	27	MAR
	DAVAO	6.8N	125.7E	2135Z	27	MAR
TAIWAN	LEGASPI	13.2N	123.8E	2139Z	27	MAR
	HUALIEN	24.0N	121.6E	2117Z	27	MAR
RUSSIA	URUP IS	46.1N	150.5E	2117Z	27	MAR
	PETROPAVLOVSK K	53.2N	159.6E	2227Z	27	MAR
	SEVERO KURILSK	50.8N	156.1E	2237Z	27	MAR
	UST KAMCHATSK	56.1N	162.6E	2249Z	27	MAR
	MEDNNY IS	54.7N	167.4E	2251Z	27	MAR
NAURU	NAURU	0.5S	166.9E	2140Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S	155.6E	2156Z	27	MAR
	PANGGOE	6.9S	157.2E	2200Z	27	MAR
	MUNDA	8.4S	157.2E	2213Z	27	MAR
	GHATERE	7.8S	159.2E	2225Z	27	MAR
	AUKI	8.8S	160.6E	2247Z	27	MAR
	HONIARA	9.3S	160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S	161.9E	2304Z	27	MAR
	KIRIBATI	TARAWA IS.	1.5N	173.0E	2212Z	27
KANTON IS.		2.8S	171.7W	0015Z	28	MAR
CHRISTMAS IS.		2.0N	157.5W	0136Z	28	MAR
MALDEN IS.		3.9S	154.9W	0210Z	28	MAR
FLINT IS.		11.4S	151.8W	0303Z	28	MAR
MIDWAY IS.		28.2N	177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S	178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N	169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S	167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S	169.9E	0046Z	28	MAR
	NUKUNONU IS.	9.2S	171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S	176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N	114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N	162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N	159.4W	0056Z	28	MAR
	HONOLULU	21.3N	157.9W	0108Z	28	MAR
	HILO	19.7N	155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S	145.8E	0106Z	28	MAR
	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR
NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR
	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR
	GISBORNE	38.7S	178.0E	0428Z	28	MAR
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR
	NAPIER	39.5S	176.9E	0459Z	28	MAR

	WESTPORT	41.8S	171.6E	0507Z	28	MAR
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR
	BLUFF	46.6S	168.3E	0533Z	28	MAR
	NELSON	41.3S	173.3E	0609Z	28	MAR
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR
FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
	HIVA OA	10.0S	139.0W	0435Z	28	MAR
	RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR
	SOCORRO	18.8N	111.0W	0708Z	28	MAR
	MAZATLAN	23.2N	106.4W	0756Z	28	MAR
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR
PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR
	CORRAL	39.8S	73.5W	1417Z	28	MAR
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR
	ARICA	18.5S	70.3W	1500Z	28	MAR
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR
	CALDERA	27.1S	70.8W	1504Z	28	MAR
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR
GUATEMALA	SIPICATE	13.9N	91.2W	1033Z	28	MAR
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR
	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR
	CORINTO	12.5N	87.2W	1149Z	28	MAR
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR
	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR
HONDURAS	AMAPALA	13.2N	87.6W	1135Z	28	MAR
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR
	ESMERELDAS	1.2N	79.8W	1248Z	28	MAR
	LA LIBERTAD	2.2S	81.2W	1304Z	28	MAR
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28	MAR
	TUMACO	1.8N	78.9W	1259Z	28	MAR
	BUENAVENTURA	3.8N	77.2W	1341Z	28	MAR
PERU	TALARA	4.6S	81.5W	1254Z	28	MAR
	LA PUNTA	12.1S	77.2W	1354Z	28	MAR
	PIMENTEL	6.9S	80.0W	1354Z	28	MAR
	CHIMBOTE	9.0S	78.8W	1356Z	28	MAR
	SAN JUAN	15.3S	75.2W	1405Z	28	MAR
	MOLLENDO	17.1S	72.0W	1437Z	28	MAR

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THIS TSUNAMI WARNING WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.

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

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**PTWC Pacific Message #6**

WEPA40 PHEB 272304  
TSUPAC

TSUNAMI BULLETIN NUMBER 6  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 2304Z 27 MAR 2013

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

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER  
- TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
- HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -  
JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE -  
TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO  
- PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR -  
COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR -  
COLOMBIA AND PERU.

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.

PRELIMINARY EARTHQUAKE PARAMETERS

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\* MAGNITUDE 9.0  
\* ORIGIN TIME 1800 UTC MAR 27 2013  
\* COORDINATES 20.2 NORTH 146.8 EAST  
\* DEPTH 19 MILES  
\* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME			OBSERVED MAX TSUNAMI HEIGHT
	OF MEASUREMENT			
POHNPEI IS	2002	UTC	3-27	1.56 FT
WAKE IS	2028	UTC	3-27	1.47 FT
KUSHIRO JAPAN	2045	UTC	3-27	0.68 FT
KWAJALEIN	2057	UTC	3-27	0.73 FT
RABAU PAPA NEW GUINEA	2122	UTC	3-27	1.32 FT
MAJURO MARSHALL IS	2133	UTC	3-27	0.98 FT
MIDWAY IS	2231	UTC	3-27	1.02 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM

ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR
	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR
	OKINAWA	26.2N 127.8E	2117Z 27 MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z 27 MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z 27 MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z 27 MAR
	KWAJALEIN	8.7N 167.7E	2057Z 27 MAR
	MAJURO	7.1N 171.4E	2133Z 27 MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z 27 MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z 27 MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z 27 MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z 27 MAR
	MANUS IS.	2.0S 147.5E	2103Z 27 MAR
	VANIMO	2.6S 141.3E	2115Z 27 MAR
	RABAU	4.2S 152.3E	2122Z 27 MAR
	WEWAK	3.5S 143.6E	2130Z 27 MAR
	KIETA	6.1S 155.6E	2143Z 27 MAR
	AMUN	6.0S 154.7E	2147Z 27 MAR
	MADANG	5.2S 145.8E	2149Z 27 MAR
	LAE	6.8S 147.0E	2225Z 27 MAR
	PORT MORESBY	9.3S 146.9E	0000Z 28 MAR
INDONESIA	WARSA	0.6S 135.8E	2108Z 27 MAR
	MANOKWARI	0.8S 134.2E	2113Z 27 MAR
	JAYAPURA	2.4S 140.8E	2117Z 27 MAR
	BEREBERE	2.5N 128.7E	2123Z 27 MAR
	GEME	4.6N 126.8E	2126Z 27 MAR
	SORONG	0.8S 131.1E	2130Z 27 MAR
	PATANI	0.4N 128.8E	2152Z 27 MAR
PHILIPPINES	PALANAN	17.1N 122.6E	2115Z 27 MAR
	DAVAO	6.8N 125.7E	2135Z 27 MAR
	LEGASPI	13.2N 123.8E	2139Z 27 MAR
TAIWAN	HUALIEN	24.0N 121.6E	2117Z 27 MAR
RUSSIA	URUP IS	46.1N 150.5E	2117Z 27 MAR
	PETROPAVLOVSK K	53.2N 159.6E	2227Z 27 MAR
	SEVERO KURILSK	50.8N 156.1E	2237Z 27 MAR
	UST KAMCHATSK	56.1N 162.6E	2249Z 27 MAR
	MEDNNY IS	54.7N 167.4E	2251Z 27 MAR
NAURU	NAURU	0.5S 166.9E	2140Z 27 MAR
SOLOMON IS.	FALAMAE	7.4S 155.6E	2156Z 27 MAR
	PANGGOE	6.9S 157.2E	2200Z 27 MAR
	MUNDA	8.4S 157.2E	2213Z 27 MAR
	GHATERE	7.8S 159.2E	2225Z 27 MAR
	AUKI	8.8S 160.6E	2247Z 27 MAR

	HONIARA	9.3S	160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S	161.9E	2304Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N	173.0E	2212Z	27	MAR
	KANTON IS.	2.8S	171.7W	0015Z	28	MAR
	CHRISTMAS IS.	2.0N	157.5W	0136Z	28	MAR
	MALDEN IS.	3.9S	154.9W	0210Z	28	MAR
	FLINT IS.	11.4S	151.8W	0303Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N	177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S	178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N	169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S	167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S	169.9E	0046Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S	171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S	176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N	114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N	162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N	159.4W	0056Z	28	MAR
	HONOLULU	21.3N	157.9W	0108Z	28	MAR
	HILO	19.7N	155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S	145.8E	0106Z	28	MAR
	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR
NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR
	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR
	GISBORNE	38.7S	178.0E	0428Z	28	MAR
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR
	NAPIER	39.5S	176.9E	0459Z	28	MAR
	WESTPORT	41.8S	171.6E	0507Z	28	MAR
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR
	BLUFF	46.6S	168.3E	0533Z	28	MAR
	NELSON	41.3S	173.3E	0609Z	28	MAR
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR
FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
	HIVA OA	10.0S	139.0W	0435Z	28	MAR
	RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR
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	MAZATLAN	23.2N	106.4W	0756Z	28	MAR
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR
PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR
	CORRAL	39.8S	73.5W	1417Z	28	MAR

	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR
	ARICA	18.5S	70.3W	1500Z	28	MAR
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR
	CALDERA	27.1S	70.8W	1504Z	28	MAR
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR
GUATEMALA	SIPICATE	13.9N	91.2W	1033Z	28	MAR
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR
	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR
	CORINTO	12.5N	87.2W	1149Z	28	MAR
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR
	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR
HONDURAS	AMAPALA	13.2N	87.6W	1135Z	28	MAR
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR
	ESMERELDAS	1.2N	79.8W	1248Z	28	MAR
	LA LIBERTAD	2.2S	81.2W	1304Z	28	MAR
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28	MAR
	TUMACO	1.8N	78.9W	1259Z	28	MAR
	BUENAVENTURA	3.8N	77.2W	1341Z	28	MAR
PERU	TALARA	4.6S	81.5W	1254Z	28	MAR
	LA PUNTA	12.1S	77.2W	1354Z	28	MAR
	PIMENTEL	6.9S	80.0W	1354Z	28	MAR
	CHIMBOTE	9.0S	78.8W	1356Z	28	MAR
	SAN JUAN	15.3S	75.2W	1405Z	28	MAR
	MOLLENDO	17.1S	72.0W	1437Z	28	MAR

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FOR ALASKA... BRITISH COLUMBIA... WASHINGTON... OREGON... AND  
CALIFORNIA.

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**PTWC Pacific Message #7**

WEPA40 PHEB 280004  
TSUPAC

TSUNAMI BULLETIN NUMBER 7  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 0004Z 28 MAR 2013

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

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER  
- TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
- HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -

JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE - TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO - PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR - COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR - COLOMBIA AND PERU.

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PRELIMINARY EARTHQUAKE PARAMETERS

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 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
RABAU PAPUA NEW GUINEA	2122 UTC 3-27	1.32 FT
MAJURO MARSHALL IS	2133 UTC 3-27	0.98 FT
MIDWAY IS	2231 UTC 3-27	1.02 FT
JOHNSTON IS	2341 UTC 3-27	1.12 FT
SHEMYA AK	0000 UTC 3-28	0.66 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR

	SHIMIZU	32.8N 133.0E	2036Z	27	MAR
	KUSHIRO	42.9N 144.3E	2045Z	27	MAR
	HACHINOHE	40.5N 141.5E	2102Z	27	MAR
	OKINAWA	26.2N 127.8E	2117Z	27	MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z	27	MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z	27	MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z	27	MAR
	KWAJALEIN	8.7N 167.7E	2057Z	27	MAR
	MAJURO	7.1N 171.4E	2133Z	27	MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z	27	MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z	27	MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z	27	MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z	27	MAR
	MANUS IS.	2.0S 147.5E	2103Z	27	MAR
	VANIMO	2.6S 141.3E	2115Z	27	MAR
	RABAU	4.2S 152.3E	2122Z	27	MAR
	WEWAK	3.5S 143.6E	2130Z	27	MAR
	KIETA	6.1S 155.6E	2143Z	27	MAR
	AMUN	6.0S 154.7E	2147Z	27	MAR
	MADANG	5.2S 145.8E	2149Z	27	MAR
	LAE	6.8S 147.0E	2225Z	27	MAR
	PORT MORESBY	9.3S 146.9E	0000Z	28	MAR
INDONESIA	WARSA	0.6S 135.8E	2108Z	27	MAR
	MANOKWARI	0.8S 134.2E	2113Z	27	MAR
	JAYAPURA	2.4S 140.8E	2117Z	27	MAR
	BEREBERE	2.5N 128.7E	2123Z	27	MAR
	GEME	4.6N 126.8E	2126Z	27	MAR
	SORONG	0.8S 131.1E	2130Z	27	MAR
	PATANI	0.4N 128.8E	2152Z	27	MAR
PHILIPPINES	PALANAN	17.1N 122.6E	2115Z	27	MAR
	DAVAO	6.8N 125.7E	2135Z	27	MAR
	LEGASPI	13.2N 123.8E	2139Z	27	MAR
TAIWAN	HUALIEN	24.0N 121.6E	2117Z	27	MAR
RUSSIA	URUP IS	46.1N 150.5E	2117Z	27	MAR
	PETROPAVLOVSK K	53.2N 159.6E	2227Z	27	MAR
	SEVERO KURILSK	50.8N 156.1E	2237Z	27	MAR
	UST KAMCHATSK	56.1N 162.6E	2249Z	27	MAR
	MEDNNY IS	54.7N 167.4E	2251Z	27	MAR
NAURU	NAURU	0.5S 166.9E	2140Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S 155.6E	2156Z	27	MAR
	PANGGOE	6.9S 157.2E	2200Z	27	MAR
	MUNDA	8.4S 157.2E	2213Z	27	MAR
	GHATERE	7.8S 159.2E	2225Z	27	MAR
	AUKI	8.8S 160.6E	2247Z	27	MAR
	HONIARA	9.3S 160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S 161.9E	2304Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N 173.0E	2212Z	27	MAR
	KANTON IS.	2.8S 171.7W	0015Z	28	MAR
	CHRISTMAS IS.	2.0N 157.5W	0136Z	28	MAR
	MALDEN IS.	3.9S 154.9W	0210Z	28	MAR
	FLINT IS.	11.4S 151.8W	0303Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N 176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S 178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S 167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S 169.9E	0046Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S 171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S 176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N 114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N 162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N 159.4W	0056Z	28	MAR
	HONOLULU	21.3N 157.9W	0108Z	28	MAR
	HILO	19.7N 155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S 145.8E	0106Z	28	MAR
	BRISBANE	27.2S 153.3E	0156Z	28	MAR
	SYDNEY	33.9S 151.4E	0226Z	28	MAR
	GLADSTONE	23.8S 151.4E	0301Z	28	MAR

	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR
NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR
	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR
	GISBORNE	38.7S	178.0E	0428Z	28	MAR
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR
	NAPIER	39.5S	176.9E	0459Z	28	MAR
	WESTPORT	41.8S	171.6E	0507Z	28	MAR
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR
	BLUFF	46.6S	168.3E	0533Z	28	MAR
	NELSON	41.3S	173.3E	0609Z	28	MAR
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR
FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
	HIVA OA	10.0S	139.0W	0435Z	28	MAR
	RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR
	SOCORRO	18.8N	111.0W	0708Z	28	MAR
	MAZATLAN	23.2N	106.4W	0756Z	28	MAR
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR
PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR
	CORRAL	39.8S	73.5W	1417Z	28	MAR
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR
	ARICA	18.5S	70.3W	1500Z	28	MAR
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR
	CALDERA	27.1S	70.8W	1504Z	28	MAR
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR
GUATEMALA	SIPICATE	13.9N	91.2W	1033Z	28	MAR
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR
	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR
	CORINTO	12.5N	87.2W	1149Z	28	MAR
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR
	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR
HONDURAS	AMAPALA	13.2N	87.6W	1135Z	28	MAR
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR

	ESMERELDAS	1.2N	79.8W	1248Z	28 MAR
	LA LIBERTAD	2.2S	81.2W	1304Z	28 MAR
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28 MAR
	TUMACO	1.8N	78.9W	1259Z	28 MAR
	BUENAVENTURA	3.8N	77.2W	1341Z	28 MAR
PERU	TALARA	4.6S	81.5W	1254Z	28 MAR
	LA PUNTA	12.1S	77.2W	1354Z	28 MAR
	PIMENTEL	6.9S	80.0W	1354Z	28 MAR
	CHIMBOTE	9.0S	78.8W	1356Z	28 MAR
	SAN JUAN	15.3S	75.2W	1405Z	28 MAR
	MOLLEDO	17.1S	72.0W	1437Z	28 MAR

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

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

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**PTWC Pacific Message #8**

WEPA40 PHEB 280104  
TSUPAC

TSUNAMI BULLETIN NUMBER 8  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 0104Z 28 MAR 2013

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

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER  
- TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
- HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -  
JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE -  
TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO  
- PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR -  
COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR -  
COLOMBIA AND PERU.

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DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND  
ANY ACTIONS TO BE TAKEN IN RESPONSE.

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE      9.0
* ORIGIN TIME    1800 UTC MAR 27 2013
* COORDINATES    20.2 NORTH 146.8 EAST
* DEPTH          19 MILES
* LOCATION       MARIANA ISLANDS REGION
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OBSERVATIONS OF TSUNAMI ACTIVITY

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SITE              TIME              OBSERVED MAX
                  OF MEASUREMENT  TSUNAMI HEIGHT
-----
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MIDWAY IS	2231	UTC	3-27	1.02	FT
JOHNSTON IS	2341	UTC	3-27	1.12	FT
SHEMYA AK	0000	UTC	3-28	0.66	FT
WEST ATKA AK	0012	UTC	3-28	0.79	FT
NAWILLIWILI HI	0056	UTC	3-28	0.75	FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

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LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
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N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
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	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR
	OKINAWA	26.2N 127.8E	2117Z 27 MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z 27 MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z 27 MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z 27 MAR
	KWAJALEIN	8.7N 167.7E	2057Z 27 MAR
	MAJURO	7.1N 171.4E	2133Z 27 MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z 27 MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z 27 MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z 27 MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z 27 MAR
	MANUS IS.	2.0S 147.5E	2103Z 27 MAR
	VANIMO	2.6S 141.3E	2115Z 27 MAR
	RABAU	4.2S 152.3E	2122Z 27 MAR
	WEWAK	3.5S 143.6E	2130Z 27 MAR
	KIETA	6.1S 155.6E	2143Z 27 MAR
	AMUN	6.0S 154.7E	2147Z 27 MAR
	MADANG	5.2S 145.8E	2149Z 27 MAR
	LAE	6.8S 147.0E	2225Z 27 MAR
	PORT MORESBY	9.3S 146.9E	0000Z 28 MAR
INDONESIA	WARSA	0.6S 135.8E	2108Z 27 MAR
	MANOKWARI	0.8S 134.2E	2113Z 27 MAR

	JAYAPURA	2.4S	140.8E	2117Z	27	MAR
	BEREBERE	2.5N	128.7E	2123Z	27	MAR
	GEME	4.6N	126.8E	2126Z	27	MAR
	SORONG	0.8S	131.1E	2130Z	27	MAR
	PATANI	0.4N	128.8E	2152Z	27	MAR
PHILIPPINES	PALANAN	17.1N	122.6E	2115Z	27	MAR
	DAVAO	6.8N	125.7E	2135Z	27	MAR
	LEGASPI	13.2N	123.8E	2139Z	27	MAR
TAIWAN	HUALIEN	24.0N	121.6E	2117Z	27	MAR
RUSSIA	URUP IS	46.1N	150.5E	2117Z	27	MAR
	PETROPAVLOVSK K	53.2N	159.6E	2227Z	27	MAR
	SEVERO KURILSK	50.8N	156.1E	2237Z	27	MAR
	UST KAMCHATSK	56.1N	162.6E	2249Z	27	MAR
	MEDNNY IS	54.7N	167.4E	2251Z	27	MAR
NAURU	NAURU	0.5S	166.9E	2140Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S	155.6E	2156Z	27	MAR
	PANGGOE	6.9S	157.2E	2200Z	27	MAR
	MUNDA	8.4S	157.2E	2213Z	27	MAR
	GHATERE	7.8S	159.2E	2225Z	27	MAR
	AUKI	8.8S	160.6E	2247Z	27	MAR
	HONIARA	9.3S	160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S	161.9E	2304Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N	173.0E	2212Z	27	MAR
	KANTON IS.	2.8S	171.7W	0015Z	28	MAR
	CHRISTMAS IS.	2.0N	157.5W	0136Z	28	MAR
	MALDEN IS.	3.9S	154.9W	0210Z	28	MAR
	FLINT IS.	11.4S	151.8W	0303Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N	177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S	178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N	169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S	167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S	169.9E	0046Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S	171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S	176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N	114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N	162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N	159.4W	0056Z	28	MAR
	HONOLULU	21.3N	157.9W	0108Z	28	MAR
	HILO	19.7N	155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S	145.8E	0106Z	28	MAR
	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR
NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR
	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR
	GISBORNE	38.7S	178.0E	0428Z	28	MAR
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR
	NAPIER	39.5S	176.9E	0459Z	28	MAR
	WESTPORT	41.8S	171.6E	0507Z	28	MAR
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR
	BLUFF	46.6S	168.3E	0533Z	28	MAR

	NELSON	41.3S	173.3E	0609Z	28	MAR
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR
FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
	HIVA OA	10.0S	139.0W	0435Z	28	MAR
	RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR
	SOCORRO	18.8N	111.0W	0708Z	28	MAR
	MAZATLAN	23.2N	106.4W	0756Z	28	MAR
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR
PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR
	CORRAL	39.8S	73.5W	1417Z	28	MAR
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR
	ARICA	18.5S	70.3W	1500Z	28	MAR
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR
	CALDERA	27.1S	70.8W	1504Z	28	MAR
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR
GUATEMALA	SIPICATE	13.9N	91.2W	1033Z	28	MAR
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR
	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR
	CORINTO	12.5N	87.2W	1149Z	28	MAR
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR
	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR
HONDURAS	AMAPALA	13.2N	87.6W	1135Z	28	MAR
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR
	ESMERELDAS	1.2N	79.8W	1248Z	28	MAR
	LA LIBERTAD	2.2S	81.2W	1304Z	28	MAR
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28	MAR
	TUMACO	1.8N	78.9W	1259Z	28	MAR
	BUENAVENTURA	3.8N	77.2W	1341Z	28	MAR
PERU	TALARA	4.6S	81.5W	1254Z	28	MAR
	LA PUNTA	12.1S	77.2W	1354Z	28	MAR
	PIMENTEL	6.9S	80.0W	1354Z	28	MAR
	CHIMBOTE	9.0S	78.8W	1356Z	28	MAR
	SAN JUAN	15.3S	75.2W	1405Z	28	MAR
	MOLLENDO	17.1S	72.0W	1437Z	28	MAR

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THIS TSUNAMI WARNING WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.

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

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**PTWC Pacific Message #9**

WEPA40 PHEB 280203

TSUPAC

TSUNAMI BULLETIN NUMBER 9  
 PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
 ISSUED AT 0203Z 28 MAR 2013

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

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
 N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
 CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
 NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
 NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER  
 - TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
 - HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -  
 JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE -  
 TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO  
 - PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR -  
 COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR -  
 COLOMBIA AND PERU.

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.

PRELIMINARY EARTHQUAKE PARAMETERS

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 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME			OBSERVED MAX TSUNAMI HEIGHT
	OF MEASUREMENT			
JOHNSTON IS	2341	UTC	3-27	1.12 FT
NAWILIWILI HI	0056	UTC	3-28	0.75 FT
HONOLULU HI	0108	UTC	3-28	1.14 FT
SHEMYA AK	0109	UTC	3-28	1.35 FT
KAWAIHAE HI	0128	UTC	3-28	4.33 FT
NIKOLSKI AK	0129	UTC	3-28	0.56 FT
AKUTAN ISLAND AK	0130	UTC	3-28	0.62 FT
KAHULUI HI	0135	UTC	3-28	6.96 FT
DUTCH HARBOR AK	0142	UTC	3-28	0.52 FT
HILO HI	0146	UTC	3-28	2.30 FT
WEST ATKA AK	0148	UTC	3-28	1.54 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY

SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR
	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR
	OKINAWA	26.2N 127.8E	2117Z 27 MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z 27 MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z 27 MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z 27 MAR
	KWAJALEIN	8.7N 167.7E	2057Z 27 MAR
	MAJURO	7.1N 171.4E	2133Z 27 MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z 27 MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z 27 MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z 27 MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z 27 MAR
	MANUS IS.	2.0S 147.5E	2103Z 27 MAR
	VANIMO	2.6S 141.3E	2115Z 27 MAR
	RABAU	4.2S 152.3E	2122Z 27 MAR
	WEWAK	3.5S 143.6E	2130Z 27 MAR
	KIETA	6.1S 155.6E	2143Z 27 MAR
	AMUN	6.0S 154.7E	2147Z 27 MAR
	MADANG	5.2S 145.8E	2149Z 27 MAR
	LAE	6.8S 147.0E	2225Z 27 MAR
	PORT MORESBY	9.3S 146.9E	0000Z 28 MAR
INDONESIA	WARSA	0.6S 135.8E	2108Z 27 MAR
	MANOKWARI	0.8S 134.2E	2113Z 27 MAR
	JAYAPURA	2.4S 140.8E	2117Z 27 MAR
	BEREBERE	2.5N 128.7E	2123Z 27 MAR
	GEME	4.6N 126.8E	2126Z 27 MAR
	SORONG	0.8S 131.1E	2130Z 27 MAR
	PATANI	0.4N 128.8E	2152Z 27 MAR
PHILIPPINES	PALANAN	17.1N 122.6E	2115Z 27 MAR
	DAVAO	6.8N 125.7E	2135Z 27 MAR
	LEGASPI	13.2N 123.8E	2139Z 27 MAR
TAIWAN	HUALIEN	24.0N 121.6E	2117Z 27 MAR
RUSSIA	URUP IS	46.1N 150.5E	2117Z 27 MAR
	PETROPAVLOVSK K	53.2N 159.6E	2227Z 27 MAR
	SEVERO KURILSK	50.8N 156.1E	2237Z 27 MAR
	UST KAMCHATSK	56.1N 162.6E	2249Z 27 MAR
	MEDNNY IS	54.7N 167.4E	2251Z 27 MAR
NAURU	NAURU	0.5S 166.9E	2140Z 27 MAR
SOLOMON IS.	FALAMAE	7.4S 155.6E	2156Z 27 MAR
	PANGGOE	6.9S 157.2E	2200Z 27 MAR
	MUNDA	8.4S 157.2E	2213Z 27 MAR
	GHATERE	7.8S 159.2E	2225Z 27 MAR

	AUKI	8.8S	160.6E	2247Z	27	MAR
	HONIARA	9.3S	160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S	161.9E	2304Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N	173.0E	2212Z	27	MAR
	KANTON IS.	2.8S	171.7W	0015Z	28	MAR
	CHRISTMAS IS.	2.0N	157.5W	0136Z	28	MAR
	MALDEN IS.	3.9S	154.9W	0210Z	28	MAR
	FLINT IS.	11.4S	151.8W	0303Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N	177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S	178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N	169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S	167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S	169.9E	0046Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S	171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S	176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N	114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N	162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N	159.4W	0056Z	28	MAR
	HONOLULU	21.3N	157.9W	0108Z	28	MAR
	HILO	19.7N	155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S	145.8E	0106Z	28	MAR
	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR
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	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR
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	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR
	NAPIER	39.5S	176.9E	0459Z	28	MAR
	WESTPORT	41.8S	171.6E	0507Z	28	MAR
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR
	BLUFF	46.6S	168.3E	0533Z	28	MAR
	NELSON	41.3S	173.3E	0609Z	28	MAR
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR
FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
	HIVA OA	10.0S	139.0W	0435Z	28	MAR
	RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR
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	MAZATLAN	23.2N	106.4W	0756Z	28	MAR
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	ACAPULCO	16.9N	99.9W	0858Z	28	MAR
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR
PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR

	CORRAL	39.8S	73.5W	1417Z	28	MAR
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR
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	COQUIMBO	29.9S	71.4W	1501Z	28	MAR
	CALDERA	27.1S	70.8W	1504Z	28	MAR
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR
GUATEMALA	SIPIGATE	13.9N	91.2W	1033Z	28	MAR
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR
	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR
	CORINTO	12.5N	87.2W	1149Z	28	MAR
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR
	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR
HONDURAS	AMAPALA	13.2N	87.6W	1135Z	28	MAR
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR
	ESMERELDAS	1.2N	79.8W	1248Z	28	MAR
	LA LIBERTAD	2.2S	81.2W	1304Z	28	MAR
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28	MAR
	TUMACO	1.8N	78.9W	1259Z	28	MAR
	BUENAVENTURA	3.8N	77.2W	1341Z	28	MAR
PERU	TALARA	4.6S	81.5W	1254Z	28	MAR
	LA PUNTA	12.1S	77.2W	1354Z	28	MAR
	PIMENTEL	6.9S	80.0W	1354Z	28	MAR
	CHIMBOTE	9.0S	78.8W	1356Z	28	MAR
	SAN JUAN	15.3S	75.2W	1405Z	28	MAR
	MOLLENDO	17.1S	72.0W	1437Z	28	MAR

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FOR ALASKA... BRITISH COLUMBIA... WASHINGTON... OREGON... AND  
CALIFORNIA.

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**PTWC Pacific Message #10**

WEPA40 PHEB 280304  
TSUPAC

TSUNAMI BULLETIN NUMBER 10  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 0304Z 28 MAR 2013

NO NEW UPDATES SINCE LAST MESSAGE.

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OCEAN AND ADJACENT SEAS... EXCEPT ALASKA... BRITISH COLUMBIA...  
WASHINGTON... OREGON AND CALIFORNIA.

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -

NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER  
 - TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
 - HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -  
 JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE -  
 TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO  
 - PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR -  
 COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR -  
 COLOMBIA AND PERU.

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.

PRELIMINARY EARTHQUAKE PARAMETERS

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 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
NAWILIWILI HI	0056 UTC 3-28	0.75 FT
HONOLULU HI	0108 UTC 3-28	1.14 FT
SHEMYA AK	0109 UTC 3-28	1.35 FT
KAWAIHAE HI	0128 UTC 3-28	4.33 FT
NIKOLSKI AK	0129 UTC 3-28	0.56 FT
KAHULUI HI	0135 UTC 3-28	6.96 FT
DUTCH HARBOR AK	0142 UTC 3-28	0.52 FT
HILO HI	0146 UTC 3-28	2.30 FT
WEST ATKA AK	0148 UTC 3-28	1.54 FT
SAND POINT AK	0224 UTC 3-28	0.30 FT
AKUTAN ISLAND AK	0240 UTC 3-28	0.89 FT
COLD BAY AK	0254 UTC 3-28	0.33 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE  
 TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED  
 WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE  
 PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE  
 TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL  
 DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE  
 LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY  
 SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM  
 ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND  
 THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS  
 WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR
	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR
	OKINAWA	26.2N 127.8E	2117Z 27 MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z 27 MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z 27 MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z 27 MAR
	KWAJALEIN	8.7N 167.7E	2057Z 27 MAR
	MAJURO	7.1N 171.4E	2133Z 27 MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z 27 MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z 27 MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z 27 MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z 27 MAR
	MANUS IS.	2.0S 147.5E	2103Z 27 MAR
	VANIMO	2.6S 141.3E	2115Z 27 MAR
	RABAU	4.2S 152.3E	2122Z 27 MAR
	WEWAK	3.5S 143.6E	2130Z 27 MAR
	KIETA	6.1S 155.6E	2143Z 27 MAR
	AMUN	6.0S 154.7E	2147Z 27 MAR
	MADANG	5.2S 145.8E	2149Z 27 MAR
	LAE	6.8S 147.0E	2225Z 27 MAR
	PORT MORESBY	9.3S 146.9E	0000Z 28 MAR
INDONESIA	WARSA	0.6S 135.8E	2108Z 27 MAR
	MANOKWARI	0.8S 134.2E	2113Z 27 MAR
	JAYAPURA	2.4S 140.8E	2117Z 27 MAR
	BEREBERE	2.5N 128.7E	2123Z 27 MAR
	GEME	4.6N 126.8E	2126Z 27 MAR
	SORONG	0.8S 131.1E	2130Z 27 MAR
	PATANI	0.4N 128.8E	2152Z 27 MAR
PHILIPPINES	PALANAN	17.1N 122.6E	2115Z 27 MAR
	DAVAO	6.8N 125.7E	2135Z 27 MAR
	LEGASPI	13.2N 123.8E	2139Z 27 MAR
TAIWAN	HUALIEN	24.0N 121.6E	2117Z 27 MAR
RUSSIA	URUP IS	46.1N 150.5E	2117Z 27 MAR
	PETROPAVLOVSK K	53.2N 159.6E	2227Z 27 MAR
	SEVERO KURILSK	50.8N 156.1E	2237Z 27 MAR
	UST KAMCHATSK	56.1N 162.6E	2249Z 27 MAR
	MEDNNY IS	54.7N 167.4E	2251Z 27 MAR
NAURU	NAURU	0.5S 166.9E	2140Z 27 MAR
SOLOMON IS.	FALAMAE	7.4S 155.6E	2156Z 27 MAR
	PANGGOE	6.9S 157.2E	2200Z 27 MAR
	MUNDA	8.4S 157.2E	2213Z 27 MAR
	GHATERE	7.8S 159.2E	2225Z 27 MAR
	AUKI	8.8S 160.6E	2247Z 27 MAR
	HONIARA	9.3S 160.0E	2249Z 27 MAR
	KIRAKIRA	10.4S 161.9E	2304Z 27 MAR
KIRIBATI	TARAWA IS.	1.5N 173.0E	2212Z 27 MAR
	KANTON IS.	2.8S 171.7W	0015Z 28 MAR
	CHRISTMAS IS.	2.0N 157.5W	0136Z 28 MAR
	MALDEN IS.	3.9S 154.9W	0210Z 28 MAR
	FLINT IS.	11.4S 151.8W	0303Z 28 MAR
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	2231Z 27 MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N 176.6W	2323Z 27 MAR
TUVALU	FUNAFUTI IS.	7.9S 178.5E	2333Z 27 MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	2341Z 27 MAR
VANUATU	ESPERITU SANTO	15.1S 167.3E	2353Z 27 MAR
	ANATOM IS.	20.2S 169.9E	0046Z 28 MAR
TOKELAU	NUKUNONU IS.	9.2S 171.8W	0039Z 28 MAR

WALLIS-FUTUNA	WALLIS IS.	13.3S	176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N	114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N	162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N	159.4W	0056Z	28	MAR
	HONOLULU	21.3N	157.9W	0108Z	28	MAR
	HILO	19.7N	155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S	145.8E	0106Z	28	MAR
	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR
NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR
	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR
	GISBORNE	38.7S	178.0E	0428Z	28	MAR
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR
	NAPIER	39.5S	176.9E	0459Z	28	MAR
	WESTPORT	41.8S	171.6E	0507Z	28	MAR
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR
	BLUFF	46.6S	168.3E	0533Z	28	MAR
	NELSON	41.3S	173.3E	0609Z	28	MAR
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR
FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
	HIVA OA	10.0S	139.0W	0435Z	28	MAR
	RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR
	SOCORRO	18.8N	111.0W	0708Z	28	MAR
	MAZATLAN	23.2N	106.4W	0756Z	28	MAR
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR
PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR
	CORRAL	39.8S	73.5W	1417Z	28	MAR
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR
	ARICA	18.5S	70.3W	1500Z	28	MAR
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR
	CALDERA	27.1S	70.8W	1504Z	28	MAR
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR
GUATEMALA	SIPICATE	13.9N	91.2W	1033Z	28	MAR
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR

	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR
	CORINTO	12.5N	87.2W	1149Z	28	MAR
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR
	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR
HONDURAS	AMAPALA	13.2N	87.6W	1135Z	28	MAR
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR
	ESMERELDAS	1.2N	79.8W	1248Z	28	MAR
	LA LIBERTAD	2.2S	81.2W	1304Z	28	MAR
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28	MAR
	TUMACO	1.8N	78.9W	1259Z	28	MAR
	BUENAVENTURA	3.8N	77.2W	1341Z	28	MAR
PERU	TALARA	4.6S	81.5W	1254Z	28	MAR
	LA PUNTA	12.1S	77.2W	1354Z	28	MAR
	PIMENTEL	6.9S	80.0W	1354Z	28	MAR
	CHIMBOTE	9.0S	78.8W	1356Z	28	MAR
	SAN JUAN	15.3S	75.2W	1405Z	28	MAR
	MOLLENDO	17.1S	72.0W	1437Z	28	MAR

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

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

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**PTWC Pacific Message #11**

WEPA40 PHEB 280403  
TSUPAC

TSUNAMI BULLETIN NUMBER 11  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 0403Z 28 MAR 2013

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

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER  
- TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
- HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -  
JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE -  
TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO  
- PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR -  
COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR -  
COLOMBIA AND PERU.

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\* MAGNITUDE 9.0  
\* ORIGIN TIME 1800 UTC MAR 27 2013

\* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
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HILO HI	0146 UTC 3-28	2.30 FT
WEST ATKA AK	0148 UTC 3-28	1.54 FT
SAND POINT AK	0224 UTC 3-28	0.30 FT
AKUTAN ISLAND AK	0240 UTC 3-28	0.89 FT
COLD BAY AK	0254 UTC 3-28	0.33 FT
KODIAK AK	0316 UTC 3-28	0.16 FT
NIKOLSKI AK	0322 UTC 3-28	1.15 FT
SEWARD AK	0348 UTC 3-28	0.23 FT
ELFIN COVE AK	0351 UTC 3-28	0.39 FT
LANGARA TG BC	0355 UTC 3-28	0.46 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR
	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR
	OKINAWA	26.2N 127.8E	2117Z 27 MAR

POHNPEI	POHNPEI IS.	7.0N	158.2E	2002Z	27	MAR
CHUUK	CHUUK IS.	7.4N	151.8E	2009Z	27	MAR
MARSHALL IS.	ENIWETOK	11.4N	162.3E	2012Z	27	MAR
	KWAJALEIN	8.7N	167.7E	2057Z	27	MAR
	MAJURO	7.1N	171.4E	2133Z	27	MAR
PALAU	MALAKAL	7.3N	134.5E	2019Z	27	MAR
WAKE IS.	WAKE IS.	19.3N	166.6E	2028Z	27	MAR
KOSRAE	KOSRAE IS.	5.5N	163.0E	2037Z	27	MAR
PAPUA NEW GUINEA	KAVIENG	2.5S	150.7E	2103Z	27	MAR
	MANUS IS.	2.0S	147.5E	2103Z	27	MAR
	VANIMO	2.6S	141.3E	2115Z	27	MAR
	RABAU	4.2S	152.3E	2122Z	27	MAR
	WEWAK	3.5S	143.6E	2130Z	27	MAR
	KIETA	6.1S	155.6E	2143Z	27	MAR
	AMUN	6.0S	154.7E	2147Z	27	MAR
	MADANG	5.2S	145.8E	2149Z	27	MAR
	LAE	6.8S	147.0E	2225Z	27	MAR
	PORT MORESBY	9.3S	146.9E	0000Z	28	MAR
INDONESIA	WARSA	0.6S	135.8E	2108Z	27	MAR
	MANOKWARI	0.8S	134.2E	2113Z	27	MAR
	JAYAPURA	2.4S	140.8E	2117Z	27	MAR
	BEREBERE	2.5N	128.7E	2123Z	27	MAR
	GEME	4.6N	126.8E	2126Z	27	MAR
	SORONG	0.8S	131.1E	2130Z	27	MAR
	PATANI	0.4N	128.8E	2152Z	27	MAR
PHILIPPINES	PALANAN	17.1N	122.6E	2115Z	27	MAR
	DAVAO	6.8N	125.7E	2135Z	27	MAR
	LEGASPI	13.2N	123.8E	2139Z	27	MAR
TAIWAN	HUALIEN	24.0N	121.6E	2117Z	27	MAR
RUSSIA	URUP IS	46.1N	150.5E	2117Z	27	MAR
	PETROPAVLOVSK K	53.2N	159.6E	2227Z	27	MAR
	SEVERO KURILSK	50.8N	156.1E	2237Z	27	MAR
	UST KAMCHATSK	56.1N	162.6E	2249Z	27	MAR
	MEDNNY IS	54.7N	167.4E	2251Z	27	MAR
NAURU	NAURU	0.5S	166.9E	2140Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S	155.6E	2156Z	27	MAR
	PANGGOE	6.9S	157.2E	2200Z	27	MAR
	MUNDA	8.4S	157.2E	2213Z	27	MAR
	GHATERE	7.8S	159.2E	2225Z	27	MAR
	AUKI	8.8S	160.6E	2247Z	27	MAR
	HONIARA	9.3S	160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S	161.9E	2304Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N	173.0E	2212Z	27	MAR
	KANTON IS.	2.8S	171.7W	0015Z	28	MAR
	CHRISTMAS IS.	2.0N	157.5W	0136Z	28	MAR
	MALDEN IS.	3.9S	154.9W	0210Z	28	MAR
	FLINT IS.	11.4S	151.8W	0303Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N	177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S	178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N	169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S	167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S	169.9E	0046Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S	171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S	176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N	114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N	162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N	159.4W	0056Z	28	MAR
	HONOLULU	21.3N	157.9W	0108Z	28	MAR
	HILO	19.7N	155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S	145.8E	0106Z	28	MAR
	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR

AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR	
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR	
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR	
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR	
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR	
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR	
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR	
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR	
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR	
NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR	
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR	
	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR	
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR	
	GISBORNE	38.7S	178.0E	0428Z	28	MAR	
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR	
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR	
	NAPIER	39.5S	176.9E	0459Z	28	MAR	
	WESTPORT	41.8S	171.6E	0507Z	28	MAR	
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR	
	BLUFF	46.6S	168.3E	0533Z	28	MAR	
	NELSON	41.3S	173.3E	0609Z	28	MAR	
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR	
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR	
	FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
		HIVA OA	10.0S	139.0W	0435Z	28	MAR
		RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR	
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR	
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR	
	SOCORRO	18.8N	111.0W	0708Z	28	MAR	
	MAZATLAN	23.2N	106.4W	0756Z	28	MAR	
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR	
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR	
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR	
	PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR	
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR	
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR	
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR	
	CORRAL	39.8S	73.5W	1417Z	28	MAR	
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR	
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR	
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR	
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR	
	ARICA	18.5S	70.3W	1500Z	28	MAR	
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR	
	CALDERA	27.1S	70.8W	1504Z	28	MAR	
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR	
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR	
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR	
GUATEMALA	SIPICATE	13.9N	91.2W	1033Z	28	MAR	
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR	
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR	
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR	
	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR	
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR	
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR	
	CORINTO	12.5N	87.2W	1149Z	28	MAR	
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR	
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR	
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR	
	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR	
HONDURAS	AMAPALA	13.2N	87.6W	1135Z	28	MAR	
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR	
	ESMERELDAS	1.2N	79.8W	1248Z	28	MAR	
	LA LIBERTAD	2.2S	81.2W	1304Z	28	MAR	
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28	MAR	
	TUMACO	1.8N	78.9W	1259Z	28	MAR	

PERU	BUENAVENTURA	3.8N	77.2W	1341Z	28 MAR
	TALARA	4.6S	81.5W	1254Z	28 MAR
	LA PUNTA	12.1S	77.2W	1354Z	28 MAR
	PIMENTEL	6.9S	80.0W	1354Z	28 MAR
	CHIMBOTE	9.0S	78.8W	1356Z	28 MAR
	SAN JUAN	15.3S	75.2W	1405Z	28 MAR
	MOLLENDO	17.1S	72.0W	1437Z	28 MAR

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

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

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**PTWC Pacific Message #12**

WEPA40 PHEB 280503  
TSUPAC

TSUNAMI BULLETIN NUMBER 12  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 0503Z 28 MAR 2013

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

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER  
- TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
- HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -  
JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE -  
TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO  
- PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR -  
COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR -  
COLOMBIA AND PERU.

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.

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE      9.0
* ORIGIN TIME    1800 UTC MAR 27 2013
* COORDINATES    20.2 NORTH 146.8 EAST
* DEPTH          19 MILES
* LOCATION       MARIANA ISLANDS REGION
    
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OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
SAND POINT AK	0224 UTC 3-28	0.30 FT
AKUTAN ISLAND AK	0240 UTC 3-28	0.89 FT
COLD BAY AK	0254 UTC 3-28	0.33 FT
KODIAK AK	0316 UTC 3-28	0.16 FT

NIKOLSKI AK	0322	UTC	3-28	1.15	FT
KING COVE AK	0344	UTC	3-28	0.43	FT
SEWARD AK	0348	UTC	3-28	0.23	FT
ELFIN COVE AK	0351	UTC	3-28	0.39	FT
LANGARA TG BC	0355	UTC	3-28	0.46	FT
CORDOVA AK	0414	UTC	3-28	0.16	FT
YAKUTAT TG AK	0418	UTC	3-28	0.36	FT
SITKA DOCK TG AK	0418	UTC	3-28	0.09	FT
SELDOVIA AK	0432	UTC	3-28	0.08	FT
AKUTAN ISLAND AK	0441	UTC	3-28	1.35	FT
HOMER AK	0442	UTC	3-28	0.07	FT
DUTCH HARBOR AK	0444	UTC	3-28	1.41	FT
WHITTIER AK	0447	UTC	3-28	0.10	FT
EUREKA CA	0456	UTC	3-28	0.94	FT
SOUTH SPIT CA	0458	UTC	3-28	1.17	FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
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N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR
	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR
	OKINAWA	26.2N 127.8E	2117Z 27 MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z 27 MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z 27 MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z 27 MAR
	KWAJALEIN	8.7N 167.7E	2057Z 27 MAR
	MAJURO	7.1N 171.4E	2133Z 27 MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z 27 MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z 27 MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z 27 MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z 27 MAR
	MANUS IS.	2.0S 147.5E	2103Z 27 MAR
	VANIMO	2.6S 141.3E	2115Z 27 MAR



	RABAUL	4.2S	152.3E	2122Z	27	MAR
	WEWAK	3.5S	143.6E	2130Z	27	MAR
	KIETA	6.1S	155.6E	2143Z	27	MAR
	AMUN	6.0S	154.7E	2147Z	27	MAR
	MADANG	5.2S	145.8E	2149Z	27	MAR
	LAE	6.8S	147.0E	2225Z	27	MAR
	PORT MORESBY	9.3S	146.9E	0000Z	28	MAR
INDONESIA	WARSA	0.6S	135.8E	2108Z	27	MAR
	MANOKWARI	0.8S	134.2E	2113Z	27	MAR
	JAYAPURA	2.4S	140.8E	2117Z	27	MAR
	BEREBERE	2.5N	128.7E	2123Z	27	MAR
	GEME	4.6N	126.8E	2126Z	27	MAR
	SORONG	0.8S	131.1E	2130Z	27	MAR
	PATANI	0.4N	128.8E	2152Z	27	MAR
PHILIPPINES	PALANAN	17.1N	122.6E	2115Z	27	MAR
	DAVAO	6.8N	125.7E	2135Z	27	MAR
	LEGASPI	13.2N	123.8E	2139Z	27	MAR
TAIWAN	HUALIEN	24.0N	121.6E	2117Z	27	MAR
RUSSIA	URUP IS	46.1N	150.5E	2117Z	27	MAR
	PETROPAVLOVSK K	53.2N	159.6E	2227Z	27	MAR
	SEVERO KURILSK	50.8N	156.1E	2237Z	27	MAR
	UST KAMCHATSK	56.1N	162.6E	2249Z	27	MAR
	MEDNNY IS	54.7N	167.4E	2251Z	27	MAR
NAURU	NAURU	0.5S	166.9E	2140Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S	155.6E	2156Z	27	MAR
	PANGGOE	6.9S	157.2E	2200Z	27	MAR
	MUNDA	8.4S	157.2E	2213Z	27	MAR
	GHATERE	7.8S	159.2E	2225Z	27	MAR
	AUKI	8.8S	160.6E	2247Z	27	MAR
	HONIARA	9.3S	160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S	161.9E	2304Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N	173.0E	2212Z	27	MAR
	KANTON IS.	2.8S	171.7W	0015Z	28	MAR
	CHRISTMAS IS.	2.0N	157.5W	0136Z	28	MAR
	MALDEN IS.	3.9S	154.9W	0210Z	28	MAR
	FLINT IS.	11.4S	151.8W	0303Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N	177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S	178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N	169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S	167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S	169.9E	0046Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S	171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S	176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N	114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N	162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N	159.4W	0056Z	28	MAR
	HONOLULU	21.3N	157.9W	0108Z	28	MAR
	HILO	19.7N	155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S	145.8E	0106Z	28	MAR
	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR
NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR

	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR
	GISBORNE	38.7S	178.0E	0428Z	28	MAR
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR
	NAPIER	39.5S	176.9E	0459Z	28	MAR
	WESTPORT	41.8S	171.6E	0507Z	28	MAR
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR
	BLUFF	46.6S	168.3E	0533Z	28	MAR
	NELSON	41.3S	173.3E	0609Z	28	MAR
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR
FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
	HIVA OA	10.0S	139.0W	0435Z	28	MAR
	RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR
	SOCORRO	18.8N	111.0W	0708Z	28	MAR
	MAZATLAN	23.2N	106.4W	0756Z	28	MAR
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR
PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR
	CORRAL	39.8S	73.5W	1417Z	28	MAR
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR
	ARICA	18.5S	70.3W	1500Z	28	MAR
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR
	CALDERA	27.1S	70.8W	1504Z	28	MAR
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR
GUATEMALA	SIPICATE	13.9N	91.2W	1033Z	28	MAR
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR
	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR
	CORINTO	12.5N	87.2W	1149Z	28	MAR
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR
	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR
HONDURAS	AMAPALA	13.2N	87.6W	1135Z	28	MAR
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR
	ESMERELDAS	1.2N	79.8W	1248Z	28	MAR
	LA LIBERTAD	2.2S	81.2W	1304Z	28	MAR
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28	MAR
	TUMACO	1.8N	78.9W	1259Z	28	MAR
	BUENAVENTURA	3.8N	77.2W	1341Z	28	MAR
PERU	TALARA	4.6S	81.5W	1254Z	28	MAR
	LA PUNTA	12.1S	77.2W	1354Z	28	MAR
	PIMENTEL	6.9S	80.0W	1354Z	28	MAR
	CHIMBOTE	9.0S	78.8W	1356Z	28	MAR
	SAN JUAN	15.3S	75.2W	1405Z	28	MAR
	MOLLENDO	17.1S	72.0W	1437Z	28	MAR

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

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

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**PTWC Pacific Message #13**

WEPA40 PHEB 280603  
TSUPAC

TSUNAMI BULLETIN NUMBER 13  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 0603Z 28 MAR 2013

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

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER  
- TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
- HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -  
JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE -  
TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO  
- PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR -  
COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR -  
COLOMBIA AND PERU.

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.

PRELIMINARY EARTHQUAKE PARAMETERS

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\* MAGNITUDE 9.0  
\* ORIGIN TIME 1800 UTC MAR 27 2013  
\* COORDINATES 20.2 NORTH 146.8 EAST  
\* DEPTH 19 MILES  
\* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
-----	-----	-----
NIKOLSKI AK	0322 UTC 3-28	1.15 FT
KING COVE AK	0344 UTC 3-28	0.43 FT
YAKUTAT TG AK	0418 UTC 3-28	0.36 FT
SELDOVIA AK	0432 UTC 3-28	0.08 FT
AKUTAN ISLAND AK	0441 UTC 3-28	1.35 FT
HOMER AK	0442 UTC 3-28	0.07 FT
WHITTIER AK	0447 UTC 3-28	0.10 FT
EUREKA CA	0456 UTC 3-28	0.94 FT
CRESCENT CITY TG CA	0506 UTC 3-28	1.16 FT
MONTEREY CA	0508 UTC 3-28	0.69 FT
SAND POINT AK	0508 UTC 3-28	0.49 FT
SANTA CRUZ CA	0509 UTC 3-28	0.75 FT
LANGARA TG BC	0510 UTC 3-28	0.75 FT
CRESCENT CITY CA	0511 UTC 3-28	1.24 FT
TOFINO BC	0512 UTC 3-28	1.38 FT

TRINIDAD CA	0512	UTC	3-28	1.61	FT
ELFIN COVE AK	0513	UTC	3-28	0.85	FT
LONG BEACH WA	0518	UTC	3-28	1.20	FT
POINT REYES TG CA	0518	UTC	3-28	0.88	FT
SEWARD AK	0518	UTC	3-28	0.30	FT
NEAH BAY TG WA	0521	UTC	3-28	0.50	FT
COLD BAY AK	0531	UTC	3-28	0.43	FT
WESTPORT WA	0531	UTC	3-28	0.90	FT
PORT SAN LUIS CA	0534	UTC	3-28	0.71	FT
CORDOVA AK	0540	UTC	3-28	2.85	FT
SITKA DOCK TG AK	0542	UTC	3-28	0.10	FT
PORT ORFORD OR	0548	UTC	3-28	2.82	FT
DUTCH HARBOR AK	0550	UTC	3-28	1.44	FT
SANTA BARBARA CA	0550	UTC	3-28	0.45	FT
SOUTH SPIT CA	0551	UTC	3-28	4.13	FT
KODIAK AK	0553	UTC	3-28	0.39	FT
CHARLESTON OR	0557	UTC	3-28	2.20	FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR
	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR
	OKINAWA	26.2N 127.8E	2117Z 27 MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z 27 MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z 27 MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z 27 MAR
	KWAJALEIN	8.7N 167.7E	2057Z 27 MAR
	MAJURO	7.1N 171.4E	2133Z 27 MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z 27 MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z 27 MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z 27 MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z 27 MAR

	MANUS IS.	2.0S	147.5E	2103Z	27	MAR
	VANIMO	2.6S	141.3E	2115Z	27	MAR
	RABAU	4.2S	152.3E	2122Z	27	MAR
	WEWAK	3.5S	143.6E	2130Z	27	MAR
	KIETA	6.1S	155.6E	2143Z	27	MAR
	AMUN	6.0S	154.7E	2147Z	27	MAR
	MADANG	5.2S	145.8E	2149Z	27	MAR
	LAE	6.8S	147.0E	2225Z	27	MAR
	PORT MORESBY	9.3S	146.9E	0000Z	28	MAR
INDONESIA	WARSA	0.6S	135.8E	2108Z	27	MAR
	MANOKWARI	0.8S	134.2E	2113Z	27	MAR
	JAYAPURA	2.4S	140.8E	2117Z	27	MAR
	BEREBERE	2.5N	128.7E	2123Z	27	MAR
	GEME	4.6N	126.8E	2126Z	27	MAR
	SORONG	0.8S	131.1E	2130Z	27	MAR
	PATANI	0.4N	128.8E	2152Z	27	MAR
PHILIPPINES	PALANAN	17.1N	122.6E	2115Z	27	MAR
	DAVAO	6.8N	125.7E	2135Z	27	MAR
	LEGASPI	13.2N	123.8E	2139Z	27	MAR
TAIWAN	HUALIEN	24.0N	121.6E	2117Z	27	MAR
RUSSIA	URUP IS	46.1N	150.5E	2117Z	27	MAR
	PETROPAVLOVSK K	53.2N	159.6E	2227Z	27	MAR
	SEVERO KURILSK	50.8N	156.1E	2237Z	27	MAR
	UST KAMCHATSK	56.1N	162.6E	2249Z	27	MAR
	MEDNNY IS	54.7N	167.4E	2251Z	27	MAR
NAURU	NAURU	0.5S	166.9E	2140Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S	155.6E	2156Z	27	MAR
	PANGGOE	6.9S	157.2E	2200Z	27	MAR
	MUNDA	8.4S	157.2E	2213Z	27	MAR
	GHATERE	7.8S	159.2E	2225Z	27	MAR
	AUKI	8.8S	160.6E	2247Z	27	MAR
	HONIARA	9.3S	160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S	161.9E	2304Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N	173.0E	2212Z	27	MAR
	KANTON IS.	2.8S	171.7W	0015Z	28	MAR
	CHRISTMAS IS.	2.0N	157.5W	0136Z	28	MAR
	MALDEN IS.	3.9S	154.9W	0210Z	28	MAR
	FLINT IS.	11.4S	151.8W	0303Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N	177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N	176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S	178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N	169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S	167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S	169.9E	0046Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S	171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S	176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N	114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N	162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N	159.4W	0056Z	28	MAR
	HONOLULU	21.3N	157.9W	0108Z	28	MAR
	HILO	19.7N	155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S	145.8E	0106Z	28	MAR
	BRISBANE	27.2S	153.3E	0156Z	28	MAR
	SYDNEY	33.9S	151.4E	0226Z	28	MAR
	GLADSTONE	23.8S	151.4E	0301Z	28	MAR
	HOBART	43.3S	147.6E	0359Z	28	MAR
	MACKAY	21.1S	149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S	171.8W	0112Z	28	MAR
JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR

NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR	
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR	
	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR	
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR	
	GISBORNE	38.7S	178.0E	0428Z	28	MAR	
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR	
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR	
	NAPIER	39.5S	176.9E	0459Z	28	MAR	
	WESTPORT	41.8S	171.6E	0507Z	28	MAR	
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR	
	BLUFF	46.6S	168.3E	0533Z	28	MAR	
	NELSON	41.3S	173.3E	0609Z	28	MAR	
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR	
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR	
	FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
HIVA OA		10.0S	139.0W	0435Z	28	MAR	
RIKITEA		23.1S	135.0W	0602Z	28	MAR	
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR	
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR	
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR	
	SOCORRO	18.8N	111.0W	0708Z	28	MAR	
	MAZATLAN	23.2N	106.4W	0756Z	28	MAR	
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR	
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR	
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR	
	PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
		ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28
CHILE	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR	
	EASTER IS.	27.1S	109.4W	0944Z	28	MAR	
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR	
	CORRAL	39.8S	73.5W	1417Z	28	MAR	
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR	
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR	
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR	
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR	
	ARICA	18.5S	70.3W	1500Z	28	MAR	
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR	
	CALDERA	27.1S	70.8W	1504Z	28	MAR	
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR	
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR	
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR	
	GUATEMALA	SIPIRATE	13.9N	91.2W	1033Z	28	MAR
	EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
	COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
CABO MATAPALO		8.4N	83.3W	1121Z	28	MAR	
NICARAGUA	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR	
	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR	
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR	
PANAMA	CORINTO	12.5N	87.2W	1149Z	28	MAR	
	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR	
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR	
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR	
HONDURAS	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR	
	AMAPALA	13.2N	87.6W	1135Z	28	MAR	
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR	
	ESMERELDAS	1.2N	79.8W	1248Z	28	MAR	
	LA LIBERTAD	2.2S	81.2W	1304Z	28	MAR	
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28	MAR	
	TUMACO	1.8N	78.9W	1259Z	28	MAR	
	BUENAVENTURA	3.8N	77.2W	1341Z	28	MAR	
PERU	TALARA	4.6S	81.5W	1254Z	28	MAR	
	LA PUNTA	12.1S	77.2W	1354Z	28	MAR	
	PIMENTEL	6.9S	80.0W	1354Z	28	MAR	
	CHIMBOTE	9.0S	78.8W	1356Z	28	MAR	
	SAN JUAN	15.3S	75.2W	1405Z	28	MAR	
	MOLLENDO	17.1S	72.0W	1437Z	28	MAR	

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**PTWC Pacific Message #14**

WEPA40 PHEB 280703  
TSUPAC

TSUNAMI BULLETIN NUMBER 14  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 0703Z 28 MAR 2013

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

...A PACIFIC-WIDE TSUNAMI WARNING IS IN EFFECT...

A TSUNAMI WARNING IS IN EFFECT FOR  
N. MARIANAS - GUAM - MARCUS IS. - YAP - JAPAN - POHNPEI -  
CHUUK - MARSHALL IS. - PALAU - WAKE IS. - KOSRAE - PAPUA  
NEW GUINEA - INDONESIA - PHILIPPINES - TAIWAN - RUSSIA -  
NAURU - SOLOMON IS. - KIRIBATI - MIDWAY IS. - HOWLAND-BAKER  
- TUVALU - JOHNSTON IS. - VANUATU - TOKELAU - WALLIS-FUTUNA  
- HONG KONG - PALMYRA IS. - HAWAII - AUSTRALIA - SAMOA -  
JARVIS IS. - FIJI - NEW CALEDONIA - COOK ISLANDS - NIUE -  
TONGA - KERMADEC IS - NEW ZEALAND - FR. POLYNESIA - MEXICO  
- PITCAIRN - ANTARCTICA - CHILE - GUATEMALA - EL SALVADOR -  
COSTA RICA - NICARAGUA - PANAMA - HONDURAS - ECUADOR -  
COLOMBIA AND PERU.

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.

PRELIMINARY EARTHQUAKE PARAMETERS

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\* MAGNITUDE            9.0  
\* ORIGIN TIME        1800 UTC MAR 27 2013  
\* COORDINATES        20.2 NORTH 146.8 EAST  
\* DEPTH                19 MILES  
\* LOCATION            MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME			OBSERVED MAX	
	OF MEASUREMENT			TSUNAMI HEIGHT	
-----	-----	-----	-----	-----	-----
YAKUTAT TG AK	0418	UTC	3-28	0.36	FT
SELDOVIA AK	0432	UTC	3-28	0.08	FT
AKUTAN ISLAND AK	0441	UTC	3-28	1.35	FT
HOMER AK	0442	UTC	3-28	0.07	FT
WHITTIER AK	0447	UTC	3-28	0.10	FT
EUREKA CA	0456	UTC	3-28	0.94	FT
MONTEREY CA	0508	UTC	3-28	0.69	FT
SANTA CRUZ CA	0509	UTC	3-28	0.75	FT
LANGARA TG BC	0510	UTC	3-28	0.75	FT
TRINIDAD CA	0512	UTC	3-28	1.61	FT
ELFIN COVE AK	0513	UTC	3-28	0.85	FT
LONG BEACH WA	0518	UTC	3-28	1.20	FT
POINT REYES TG CA	0518	UTC	3-28	0.88	FT

SEWARD AK	0518	UTC	3-28	0.30	FT
NEAH BAY TG WA	0521	UTC	3-28	0.50	FT
COLD BAY AK	0531	UTC	3-28	0.43	FT
WESTPORT WA	0531	UTC	3-28	0.90	FT
CORDOVA AK	0540	UTC	3-28	2.85	FT
SITKA DOCK TG AK	0542	UTC	3-28	0.10	FT
PORT ORFORD OR	0548	UTC	3-28	2.82	FT
DUTCH HARBOR AK	0550	UTC	3-28	1.44	FT
SANTA BARBARA CA	0550	UTC	3-28	0.45	FT
SOUTH SPIT CA	0551	UTC	3-28	4.13	FT
KODIAK AK	0553	UTC	3-28	0.39	FT
CHARLESTON OR	0557	UTC	3-28	2.20	FT
MONTEREY CA	0600	UTC	3-28	0.92	FT
ASTORIA TG OR	0605	UTC	3-28	0.39	FT
PORT ANGELES TG WA	0606	UTC	3-28	0.43	FT
TRINIDAD CA	0606	UTC	3-28	4.36	FT
LA HARBOR CA	0608	UTC	3-28	0.31	FT
LA JOLLA CA	0612	UTC	3-28	0.53	FT
TOFINO BC	0612	UTC	3-28	2.56	FT
KING COVE AK	0618	UTC	3-28	0.82	FT
SAN DIEGO NAVAL PIER CA	0623	UTC	3-28	0.73	FT
CRESCENT CITY TG CA	0636	UTC	3-28	2.43	FT
CRESCENT CITY CA	0636	UTC	3-28	2.36	FT
PORT SAN LUIS CA	0636	UTC	3-28	2.17	FT
SAND POINT AK	0638	UTC	3-28	0.92	FT
SANTA MONICA TG CA	0647	UTC	3-28	0.75	FT
PORT TOWNSEND WA	0653	UTC	3-28	0.39	FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE TO COASTS AND ISLANDS IN THE PACIFIC. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS THREAT. THIS CENTER WILL CONTINUE TO MONITOR SEA LEVEL DATA TO DETERMINE THE EXTENT AND SEVERITY OF THE THREAT.

A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI HEIGHTS CANNOT BE FORECASTED AND CAN VARY SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR AND THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

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 TSUNAMI 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 AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. 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	FORECAST POINT	COORDINATES	ARRIVAL TIME
N. MARIANAS	SAIPAN	15.3N 145.8E	1834Z 27 MAR
GUAM	GUAM	13.4N 144.7E	1856Z 27 MAR
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1905Z 27 MAR
YAP	YAP IS.	9.5N 138.1E	1946Z 27 MAR
JAPAN	KATSUURA	35.1N 140.3E	1947Z 27 MAR
	SHIMIZU	32.8N 133.0E	2036Z 27 MAR
	KUSHIRO	42.9N 144.3E	2045Z 27 MAR
	HACHINOHE	40.5N 141.5E	2102Z 27 MAR



	OKINAWA	26.2N 127.8E	2117Z	27	MAR
POHNPEI	POHNPEI IS.	7.0N 158.2E	2002Z	27	MAR
CHUUK	CHUUK IS.	7.4N 151.8E	2009Z	27	MAR
MARSHALL IS.	ENIWETOK	11.4N 162.3E	2012Z	27	MAR
	KWAJALEIN	8.7N 167.7E	2057Z	27	MAR
	MAJURO	7.1N 171.4E	2133Z	27	MAR
PALAU	MALAKAL	7.3N 134.5E	2019Z	27	MAR
WAKE IS.	WAKE IS.	19.3N 166.6E	2028Z	27	MAR
KOSRAE	KOSRAE IS.	5.5N 163.0E	2037Z	27	MAR
PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	2103Z	27	MAR
	MANUS IS.	2.0S 147.5E	2103Z	27	MAR
	VANIMO	2.6S 141.3E	2115Z	27	MAR
	RABAU	4.2S 152.3E	2122Z	27	MAR
	WEWAK	3.5S 143.6E	2130Z	27	MAR
	KIETA	6.1S 155.6E	2143Z	27	MAR
	AMUN	6.0S 154.7E	2147Z	27	MAR
	MADANG	5.2S 145.8E	2149Z	27	MAR
	LAE	6.8S 147.0E	2225Z	27	MAR
	PORT MORESBY	9.3S 146.9E	0000Z	28	MAR
INDONESIA	WARSA	0.6S 135.8E	2108Z	27	MAR
	MANOKWARI	0.8S 134.2E	2113Z	27	MAR
	JAYAPURA	2.4S 140.8E	2117Z	27	MAR
	BEREBERE	2.5N 128.7E	2123Z	27	MAR
	GEME	4.6N 126.8E	2126Z	27	MAR
	SORONG	0.8S 131.1E	2130Z	27	MAR
	PATANI	0.4N 128.8E	2152Z	27	MAR
PHILIPPINES	PALANAN	17.1N 122.6E	2115Z	27	MAR
	DAVAO	6.8N 125.7E	2135Z	27	MAR
	LEGASPI	13.2N 123.8E	2139Z	27	MAR
TAIWAN	HUALIEN	24.0N 121.6E	2117Z	27	MAR
RUSSIA	URUP IS	46.1N 150.5E	2117Z	27	MAR
	PETROPAVLOVSK K	53.2N 159.6E	2227Z	27	MAR
	SEVERO KURILSK	50.8N 156.1E	2237Z	27	MAR
	UST KAMCHATSK	56.1N 162.6E	2249Z	27	MAR
	MEDNNY IS	54.7N 167.4E	2251Z	27	MAR
NAURU	NAURU	0.5S 166.9E	2140Z	27	MAR
SOLOMON IS.	FALAMAE	7.4S 155.6E	2156Z	27	MAR
	PANGGOE	6.9S 157.2E	2200Z	27	MAR
	MUNDA	8.4S 157.2E	2213Z	27	MAR
	GHATERE	7.8S 159.2E	2225Z	27	MAR
	AUKI	8.8S 160.6E	2247Z	27	MAR
	HONIARA	9.3S 160.0E	2249Z	27	MAR
	KIRAKIRA	10.4S 161.9E	2304Z	27	MAR
KIRIBATI	TARAWA IS.	1.5N 173.0E	2212Z	27	MAR
	KANTON IS.	2.8S 171.7W	0015Z	28	MAR
	CHRISTMAS IS.	2.0N 157.5W	0136Z	28	MAR
	MALDEN IS.	3.9S 154.9W	0210Z	28	MAR
	FLINT IS.	11.4S 151.8W	0303Z	28	MAR
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	2231Z	27	MAR
HOWLAND-BAKER	HOWLAND IS.	0.6N 176.6W	2323Z	27	MAR
TUVALU	FUNAFUTI IS.	7.9S 178.5E	2333Z	27	MAR
JOHNSTON IS.	JOHNSTON IS.	16.7N 169.5W	2341Z	27	MAR
VANUATU	ESPERITU SANTO	15.1S 167.3E	2353Z	27	MAR
	ANATOM IS.	20.2S 169.9E	0046Z	28	MAR
TOKELAU	NUKUNONU IS.	9.2S 171.8W	0039Z	28	MAR
WALLIS-FUTUNA	WALLIS IS.	13.3S 176.3W	0042Z	28	MAR
HONG KONG	HONG KONG	22.3N 114.2E	0043Z	28	MAR
PALMYRA IS.	PALMYRA IS.	6.3N 162.4W	0044Z	28	MAR
HAWAII	NAWILIWILI	22.0N 159.4W	0056Z	28	MAR
	HONOLULU	21.3N 157.9W	0108Z	28	MAR
	HILO	19.7N 155.1W	0146Z	28	MAR
AUSTRALIA	CAIRNS	16.7S 145.8E	0106Z	28	MAR
	BRISBANE	27.2S 153.3E	0156Z	28	MAR
	SYDNEY	33.9S 151.4E	0226Z	28	MAR
	GLADSTONE	23.8S 151.4E	0301Z	28	MAR
	HOBART	43.3S 147.6E	0359Z	28	MAR
	MACKAY	21.1S 149.3E	0456Z	28	MAR
SAMOA	APIA	13.8S 171.8W	0112Z	28	MAR

JARVIS IS.	JARVIS IS.	0.4S	160.1W	0119Z	28	MAR
AMERICAN SAMOA	PAGO PAGO	14.3S	170.7W	0120Z	28	MAR
FIJI	SUVA	18.1S	178.4E	0125Z	28	MAR
NEW CALEDONIA	NOUMEA	22.3S	166.5E	0127Z	28	MAR
COOK ISLANDS	PUKAPUKA IS.	10.8S	165.9W	0128Z	28	MAR
	PENRHYN IS.	8.9S	157.8W	0212Z	28	MAR
	RAROTONGA	21.2S	159.8W	0257Z	28	MAR
NIUE	NIUE IS.	19.0S	170.0W	0145Z	28	MAR
TONGA	NUKUALOFA	21.0S	175.2W	0211Z	28	MAR
KERMADEC IS	RAOUL IS.	29.2S	177.9W	0253Z	28	MAR
NEW ZEALAND	NORTH CAPE	34.4S	173.3E	0257Z	28	MAR
	EAST CAPE	37.7S	178.5E	0344Z	28	MAR
	AUCKLAND-W	37.1S	174.2E	0357Z	28	MAR
	MILFORD SOUND	44.6S	167.9E	0410Z	28	MAR
	GISBORNE	38.7S	178.0E	0428Z	28	MAR
	AUCKLAND-E	36.7S	175.0E	0434Z	28	MAR
	NEW PLYMOUTH	39.1S	174.1E	0446Z	28	MAR
	NAPIER	39.5S	176.9E	0459Z	28	MAR
	WESTPORT	41.8S	171.6E	0507Z	28	MAR
	WELLINGTON	41.3S	174.8E	0519Z	28	MAR
	BLUFF	46.6S	168.3E	0533Z	28	MAR
	NELSON	41.3S	173.3E	0609Z	28	MAR
	LYTTELTON	43.6S	172.7E	0630Z	28	MAR
	DUNEDIN	45.9S	170.5E	0635Z	28	MAR
FR. POLYNESIA	PAPEETE	17.5S	149.6W	0353Z	28	MAR
	HIVA OA	10.0S	139.0W	0435Z	28	MAR
	RIKITEA	23.1S	135.0W	0602Z	28	MAR
MEXICO	ENSENADA	31.8N	116.8W	0546Z	28	MAR
	PUNTA ABREOJOS	26.7N	113.6W	0628Z	28	MAR
	CABO SAN LUCAS	22.8N	110.0W	0702Z	28	MAR
	SOCORRO	18.8N	111.0W	0708Z	28	MAR
	MAZATLAN	23.2N	106.4W	0756Z	28	MAR
	MANZANILLO	19.1N	104.3W	0814Z	28	MAR
	ACAPULCO	16.9N	99.9W	0858Z	28	MAR
	PUERTO MADERO	14.8N	92.5W	1024Z	28	MAR
PITCAIRN	PITCAIRN IS.	25.1S	130.1W	0650Z	28	MAR
ANTARCTICA	CAPE ADARE	71.0S	170.0E	0758Z	28	MAR
	THURSTON IS.	72.0S	100.0W	1137Z	28	MAR
CHILE	EASTER IS.	27.1S	109.4W	0944Z	28	MAR
	GOLFO DE PENAS	47.1S	74.9W	1338Z	28	MAR
	CORRAL	39.8S	73.5W	1417Z	28	MAR
	PUERTO WILLIAMS	54.8S	68.2W	1439Z	28	MAR
	TALCAHUANO	36.7S	73.1W	1447Z	28	MAR
	VALPARAISO	33.0S	71.6W	1448Z	28	MAR
	IQUIQUE	20.2S	70.1W	1455Z	28	MAR
	ARICA	18.5S	70.3W	1500Z	28	MAR
	COQUIMBO	29.9S	71.4W	1501Z	28	MAR
	CALDERA	27.1S	70.8W	1504Z	28	MAR
	ANTOFAGASTA	23.3S	70.4W	1505Z	28	MAR
	PUNTA ARENAS	53.2S	70.9W	1512Z	28	MAR
	PUERTO MONTT	41.5S	73.0W	1634Z	28	MAR
GUATEMALA	SIPICATE	13.9N	91.2W	1033Z	28	MAR
EL SALVADOR	ACAJUTLA	13.6N	89.8W	1045Z	28	MAR
COSTA RICA	CABO SAN ELENA	10.9N	86.0W	1059Z	28	MAR
	CABO MATAPALO	8.4N	83.3W	1121Z	28	MAR
	PUERTO QUEPOS	9.4N	84.2W	1129Z	28	MAR
NICARAGUA	SAN JUAN DL SUR	11.2N	85.9W	1114Z	28	MAR
	PUERTO SANDINO	12.2N	86.8W	1147Z	28	MAR
	CORINTO	12.5N	87.2W	1149Z	28	MAR
PANAMA	PUNTA BURICA	8.0N	82.9W	1131Z	28	MAR
	PUNTA MALA	7.5N	80.0W	1219Z	28	MAR
	PUERTO PINA	7.4N	78.0W	1232Z	28	MAR
	BALBOA HTS.	9.0N	79.6W	1341Z	28	MAR
HONDURAS	AMAPALA	13.2N	87.6W	1135Z	28	MAR
ECUADOR	BALTRA IS.	0.5S	90.3W	1138Z	28	MAR
	ESMERELDAS	1.2N	79.8W	1248Z	28	MAR
	LA LIBERTAD	2.2S	81.2W	1304Z	28	MAR
COLOMBIA	BAHIA SOLANO	6.3N	77.4W	1239Z	28	MAR

	TUMACO	1.8N	78.9W	1259Z	28	MAR
	BUENAVENTURA	3.8N	77.2W	1341Z	28	MAR
PERU	TALARA	4.6S	81.5W	1254Z	28	MAR
	LA PUNTA	12.1S	77.2W	1354Z	28	MAR
	PIMENTEL	6.9S	80.0W	1354Z	28	MAR
	CHIMBOTE	9.0S	78.8W	1356Z	28	MAR
	SAN JUAN	15.3S	75.2W	1405Z	28	MAR
	MOLLENDO	17.1S	72.0W	1437Z	28	MAR

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

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

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**PTWC Pacific Message #15**

WEPA40 PHEB 280804  
TSUPAC

TSUNAMI BULLETIN NUMBER 15  
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS  
ISSUED AT 0804Z 28 MAR 2013

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

...TSUNAMI WARNING CANCELLATION...

THE TSUNAMI WARNING IS 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.

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE      9.0
* ORIGIN TIME    1800 UTC MAR 27 2013
* COORDINATES    20.2 NORTH 146.8 EAST
* DEPTH          19 MILES
* LOCATION       MARIANA ISLANDS REGION
    
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OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
MONTEREY CA	0508 UTC 3-28	0.69 FT
SANTA CRUZ CA	0509 UTC 3-28	0.75 FT
LANGARA TG BC	0510 UTC 3-28	0.75 FT
TOFINO BC	0512 UTC 3-28	1.38 FT
TRINIDAD CA	0512 UTC 3-28	1.61 FT
ELFIN COVE AK	0513 UTC 3-28	0.85 FT
LONG BEACH WA	0518 UTC 3-28	1.20 FT
POINT REYES TG CA	0518 UTC 3-28	0.88 FT
SEWARD AK	0518 UTC 3-28	0.30 FT
NEAH BAY TG WA	0521 UTC 3-28	0.50 FT
COLD BAY AK	0531 UTC 3-28	0.43 FT
WESTPORT WA	0531 UTC 3-28	0.90 FT
CORDOVA AK	0540 UTC 3-28	2.85 FT

SITKA DOCK TG AK	0542	UTC	3-28	0.10	FT
PORT ORFORD OR	0548	UTC	3-28	2.82	FT
DUTCH HARBOR AK	0550	UTC	3-28	1.44	FT
SANTA BARBARA CA	0550	UTC	3-28	0.45	FT
SOUTH SPIT CA	0551	UTC	3-28	4.13	FT
KODIAK AK	0553	UTC	3-28	0.39	FT
CHARLESTON OR	0557	UTC	3-28	2.20	FT
MONTEREY CA	0600	UTC	3-28	0.92	FT
ASTORIA TG OR	0605	UTC	3-28	0.39	FT
PORT ANGELES TG WA	0606	UTC	3-28	0.43	FT
TRINIDAD CA	0606	UTC	3-28	4.36	FT
LA HARBOR CA	0608	UTC	3-28	0.31	FT
LA JOLLA CA	0612	UTC	3-28	0.53	FT
TOFINO BC	0612	UTC	3-28	2.56	FT
KING COVE AK	0618	UTC	3-28	0.82	FT
SAN DIEGO NAVAL PIER CA	0623	UTC	3-28	0.73	FT
CRESCENT CITY TG CA	0636	UTC	3-28	2.43	FT
CRESCENT CITY CA	0636	UTC	3-28	2.36	FT
PORT SAN LUIS CA	0636	UTC	3-28	2.17	FT
SAND POINT AK	0638	UTC	3-28	0.92	FT
SANTA MONICA TG CA	0647	UTC	3-28	0.75	FT
PORT TOWNSEND WA	0653	UTC	3-28	0.39	FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

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 IS 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... AND CALIFORNIA.

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**PTWC Hawaii Messages**

**PTWC Hawaii Message #1**

WEHW40 PHEB 271806  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-271906-  
 /T.NEW.PHEB.TS.A.0121.130327T1806Z-000000T0000Z/

BULLETIN  
 TSUNAMI MESSAGE NUMBER 1  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 806 AM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WATCH BULLETIN...

A TSUNAMI WATCH IS ISSUED FOR THE STATE OF HAWAII EFFECTIVE  
 AT 806 AM HST.

PRELIMINARY EARTHQUAKE PARAMETERS

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 \* MAGNITUDE 8.3  
 \* ORIGIN TIME 0800 HST MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS 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 TIMES IN HAWAII OF THE FIRST TSUNAMI  
 WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST MARCH 27
HONOLULU	HAWAII	308 PM	HST MARCH 27
HILO	HAWAII	346 PM	HST MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #2**

WEHW40 PHEB 271905  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-272005-  
 /T.CON.PHEB.TS.A.0121.000000T0000Z-000000T0000Z/

BULLETIN  
 TSUNAMI MESSAGE NUMBER 2  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 905 AM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WATCH SUPPLEMENT...

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

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE      8.8
* ORIGIN TIME    0800 HST MAR 27 2013
                  1800 UTC MAR 27 2013
* COORDINATES    20.2 NORTH 146.8 EAST
* DEPTH          19 MILES
* LOCATION       MARIANA ISLANDS REGION
    
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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 TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST MARCH 27
HONOLULU	HAWAII	308 PM	HST MARCH 27
HILO	HAWAII	346 PM	HST MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #3**

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WEHW40 PHEB 272006
TSUHWX
HIZ001>003-005>009-012>014-016>021-023>026-272106-
/T.CON.PHEB.TS.A.0121.000000T0000Z-000000T0000Z/
    
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BULLETIN

TSUNAMI MESSAGE NUMBER 3  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 1006 AM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WATCH SUPPLEMENT...

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

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE      9.0
* ORIGIN TIME    0800 HST MAR 27 2013
                  1800 UTC MAR 27 2013
* COORDINATES    20.2 NORTH 146.8 EAST
* DEPTH          19 MILES
* LOCATION       MARIANA ISLANDS REGION
    
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OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
GUAM	1856 UTC 3-27	0.81 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

DEEP OCEAN PRESSURE SENSOR DATA INDICATES A TSUNAMI WAS GENERATED.

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 TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST MARCH 27
HONOLULU	HAWAII	308 PM	HST MARCH 27
HILO	HAWAII	346 PM	HST MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #4**

WEHW40 PHEB 272104  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-272204-  
 /T.CAN.PHEB.TS.A.0121.000000T0000Z-000000T0000Z/  
 /T.NEW.PHEB.TS.W.0121.130327T2104Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED  
 TSUNAMI MESSAGE NUMBER 4  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 1104 AM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING BULLETIN...

A TSUNAMI WARNING IS ISSUED FOR THE STATE OF HAWAII EFFECTIVE AT 1104 AM HST.

PRELIMINARY EARTHQUAKE PARAMETERS

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 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 0800 HST MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
-----		
GUAM	1856 UTC 3-27	0.81 FT
POHNPEI IS	2002 UTC 3-27	1.56 FT
WAKE IS	2028 UTC 3-27	1.47 FT
KUSHIRO JAPAN	2045 UTC 3-27	0.68 FT
KWAJALEIN	2057 UTC 3-27	0.73 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

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 TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST MARCH 27
HONOLULU	HAWAII	308 PM	HST MARCH 27
HILO	HAWAII	346 PM	HST MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #5**

WEHW40 PHEB 272205  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-272305-  
 /T.CON.PHEB.TS.W.0121.000000T0000Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED  
 TSUNAMI MESSAGE NUMBER 5  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 1205 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING SUPPLEMENT...

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

PRELIMINARY EARTHQUAKE PARAMETERS

-----  
 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 0800 HST MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
POHNPEI IS	2002 UTC 3-27	1.56 FT
WAKE IS	2028 UTC 3-27	1.47 FT
KUSHIRO JAPAN	2045 UTC 3-27	0.68 FT
KWAJALEIN	2057 UTC 3-27	0.73 FT
RABAUl PAPUA NEW GUINEA	2122 UTC 3-27	1.32 FT
MAJURO MARSHALL IS	2133 UTC 3-27	0.98 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

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 TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST	MARCH 27
HONOLULU	HAWAII	308 PM	HST	MARCH 27
HILO	HAWAII	346 PM	HST	MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #6**

WEHW40 PHEB 272305  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280005-  
 /T.CON.PHEB.TS.W.0121.000000T0000Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED  
 TSUNAMI MESSAGE NUMBER 6  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 105 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING SUPPLEMENT...

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

PRELIMINARY EARTHQUAKE PARAMETERS

-----  
 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 0800 HST MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME			OBSERVED MAX TSUNAMI HEIGHT
	OF MEASUREMENT			
-----				
POHNPEI IS	2002	UTC	3-27	1.56 FT
WAKE IS	2028	UTC	3-27	1.47 FT
KUSHIRO JAPAN	2045	UTC	3-27	0.68 FT
KWAJALEIN	2057	UTC	3-27	0.73 FT
RABAUl PAPUA NEW GUINEA	2122	UTC	3-27	1.32 FT
MAJURO MARSHALL IS	2133	UTC	3-27	0.98 FT
MIDWAY IS	2231	UTC	3-27	1.02 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

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 TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST MARCH 27
HONOLULU	HAWAII	308 PM	HST MARCH 27
HILO	HAWAII	346 PM	HST MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #7**

WEHW40 PHEB 280005  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280105-  
 /T.CON.PHEB.TS.W.0121.000000T0000Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED  
 TSUNAMI MESSAGE NUMBER 7  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 205 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING SUPPLEMENT...

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

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE      9.0
* ORIGIN TIME    0800  HST MAR 27 2013
                  1800  UTC MAR 27 2013
* COORDINATES    20.2 NORTH 146.8 EAST
* DEPTH          19 MILES
* LOCATION       MARIANA ISLANDS REGION
    
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OBSERVATIONS OF TSUNAMI ACTIVITY

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SITE                TIME                OBSERVED MAX
                   OF MEASUREMENT          TSUNAMI HEIGHT
-----
RABAU  PAPUA NEW GUINEA  2122  UTC  3-27          1.32  FT
MAJURO MARSHALL IS    2133  UTC  3-27          0.98  FT
MIDWAY IS              2231  UTC  3-27          1.02  FT
JOHNSTON IS           2341  UTC  3-27          1.12  FT
SHEMYA AK              0000  UTC  3-28          0.66  FT
    
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HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

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 TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST	MARCH 27
HONOLULU	HAWAII	308 PM	HST	MARCH 27
HILO	HAWAII	346 PM	HST	MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #8**

WEHW40 PHEB 280105  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280205-  
 /T.CON.PHEB.TS.W.0121.000000T0000Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED  
 TSUNAMI MESSAGE NUMBER 8  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 305 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING SUPPLEMENT...

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

PRELIMINARY EARTHQUAKE PARAMETERS

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-----
* MAGNITUDE      9.0
* ORIGIN TIME    0800 HST MAR 27 2013
                  1800 UTC MAR 27 2013
* COORDINATES    20.2 NORTH 146.8 EAST
* DEPTH          19 MILES
* LOCATION       MARIANA ISLANDS REGION
    
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OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
MIDWAY IS	2231 UTC 3-27	1.02 FT
JOHNSTON IS	2341 UTC 3-27	1.12 FT
SHEMYA AK	0000 UTC 3-28	0.66 FT
WEST ATKA AK	0012 UTC 3-28	0.79 FT
NAWILIWILI HI	0056 UTC 3-28	0.75 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

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.

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THE ESTIMATED ARRIVAL TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST	MARCH 27
HONOLULU	HAWAII	308 PM	HST	MARCH 27
HILO	HAWAII	346 PM	HST	MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #9**

WEHW40 PHEB 280205  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280305-  
 /T.CON.PHEB.TS.W.0121.000000T0000Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED  
 TSUNAMI MESSAGE NUMBER 9  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 405 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI WARNING SUPPLEMENT...

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

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE      9.0
* ORIGIN TIME    0800 HST MAR 27 2013
                  1800 UTC MAR 27 2013
* COORDINATES    20.2 NORTH 146.8 EAST
* DEPTH          19 MILES
* LOCATION       MARIANA ISLANDS REGION
    
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OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
JOHNSTON IS	2341 UTC 3-27	1.12 FT
NAWILLIWILI HI	0056 UTC 3-28	0.75 FT
HONOLULU HI	0108 UTC 3-28	1.14 FT
SHEMYA AK	0109 UTC 3-28	1.35 FT

KAWAIHAE HI	0128	UTC	3-28	4.33	FT
NIKOLSKI AK	0129	UTC	3-28	0.56	FT
AKUTAN ISLAND AK	0130	UTC	3-28	0.62	FT
KAHULUI HI	0135	UTC	3-28	6.96	FT
DUTCH HARBOR AK	0142	UTC	3-28	0.52	FT
HILO HI	0146	UTC	3-28	2.30	FT
WEST ATKA AK	0148	UTC	3-28	1.54	FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

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 TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST	MARCH 27
HONOLULU	HAWAII	308 PM	HST	MARCH 27
HILO	HAWAII	346 PM	HST	MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #10**

WEHW40 PHEB 280306  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280406-  
 /T.CAN.PHEB.TS.W.0121.000000T0000Z-000000T0000Z/  
 /T.NEW.PHEB.TS.Y.0121.130328T0306Z-000000T0000Z/

TSUNAMI MESSAGE NUMBER 10  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 506 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI ADVISORY BULLETIN...

A TSUNAMI ADVISORY IS ISSUED FOR THE STATE OF HAWAII EFFECTIVE AT 506 PM HST. ALL HAWAIIAN TIDE GAUGES ARE REPORTING AMPLITUDES OF LESS THAN 0.3 METERS (0.98 FT).

PRELIMINARY EARTHQUAKE PARAMETERS

- 
- \* MAGNITUDE 9.0
  - \* ORIGIN TIME 0800 HST MAR 27 2013  
1800 UTC MAR 27 2013
  - \* COORDINATES 20.2 NORTH 146.8 EAST
  - \* DEPTH 19 MILES

\* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
NAWILIWILI HI	0056 UTC 3-28	0.75 FT
HONOLULU HI	0108 UTC 3-28	1.14 FT
SHEMYA AK	0109 UTC 3-28	1.35 FT
KAWAIHAE HI	0128 UTC 3-28	4.33 FT
NIKOLSKI AK	0129 UTC 3-28	0.56 FT
KAHULUI HI	0135 UTC 3-28	6.96 FT
DUTCH HARBOR AK	0142 UTC 3-28	0.52 FT
HILO HI	0146 UTC 3-28	2.30 FT
WEST ATKA AK	0148 UTC 3-28	1.54 FT
SAND POINT AK	0224 UTC 3-28	0.30 FT
AKUTAN ISLAND AK	0240 UTC 3-28	0.89 FT
COLD BAY AK	0254 UTC 3-28	0.33 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD IMPACT THE 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.

A TSUNAMI ADVISORY MEANS THAT A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS IMMINENT... EXPECTED OR OCCURRING. 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.

THE ESTIMATED ARRIVAL TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST	MARCH 27
HONOLULU	HAWAII	308 PM	HST	MARCH 27
HILO	HAWAII	346 PM	HST	MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #11**

WEHW40 PHEB 280404  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280504-  
 /T.CON.PHEB.TS.Y.0121.000000T0000Z-000000T0000Z/

TSUNAMI MESSAGE NUMBER 11  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 604 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI ADVISORY SUPPLEMENT...

THE TSUNAMI ADVISORY CONTINUES IN EFFECT FOR THE STATE OF HAWAII.

PRELIMINARY EARTHQUAKE PARAMETERS

\* MAGNITUDE 9.0  
 \* ORIGIN TIME 0800 HST MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
HONOLULU HI	0108 UTC 3-28	1.14 FT
SHEMYA AK	0109 UTC 3-28	1.35 FT
KAWAIHAE HI	0128 UTC 3-28	4.33 FT
KAHULUI HI	0135 UTC 3-28	6.96 FT
DUTCH HARBOR AK	0142 UTC 3-28	0.52 FT
HILO HI	0146 UTC 3-28	2.30 FT
WEST ATKA AK	0148 UTC 3-28	1.54 FT
SAND POINT AK	0224 UTC 3-28	0.30 FT
AKUTAN ISLAND AK	0240 UTC 3-28	0.89 FT
COLD BAY AK	0254 UTC 3-28	0.33 FT
KODIAK AK	0316 UTC 3-28	0.16 FT
NIKOLSKI AK	0322 UTC 3-28	1.15 FT
SEWARD AK	0348 UTC 3-28	0.23 FT
ELFIN COVE AK	0351 UTC 3-28	0.39 FT
LANGARA TG BC	0355 UTC 3-28	0.46 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD IMPACT THE 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.

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THE ESTIMATED ARRIVAL TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST MARCH 27
HONOLULU	HAWAII	308 PM	HST MARCH 27
HILO	HAWAII	346 PM	HST MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #12**

WEHW40 PHEB 280504  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280604-  
 /T.CON.PHEB.TS.Y.0121.000000T0000Z-000000T0000Z/

TSUNAMI MESSAGE NUMBER 12  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 704 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI ADVISORY SUPPLEMENT...

THE TSUNAMI ADVISORY CONTINUES IN EFFECT FOR THE STATE OF HAWAII.

PRELIMINARY EARTHQUAKE PARAMETERS

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-----
* MAGNITUDE          9.0
* ORIGIN TIME        0800 HST MAR 27 2013
                    1800 UTC MAR 27 2013
* COORDINATES        20.2 NORTH 146.8 EAST
* DEPTH              19 MILES
* LOCATION            MARIANA ISLANDS REGION
    
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OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
SAND POINT AK	0224 UTC 3-28	0.30 FT
AKUTAN ISLAND AK	0240 UTC 3-28	0.89 FT
COLD BAY AK	0254 UTC 3-28	0.33 FT
KODIAK AK	0316 UTC 3-28	0.16 FT
NIKOLSKI AK	0322 UTC 3-28	1.15 FT
KING COVE AK	0344 UTC 3-28	0.43 FT
SEWARD AK	0348 UTC 3-28	0.23 FT
ELFIN COVE AK	0351 UTC 3-28	0.39 FT
LANGARA TG BC	0355 UTC 3-28	0.46 FT
CORDOVA AK	0414 UTC 3-28	0.16 FT
YAKUTAT TG AK	0418 UTC 3-28	0.36 FT
SITKA DOCK TG AK	0418 UTC 3-28	0.09 FT
SELDOVIA AK	0432 UTC 3-28	0.08 FT
AKUTAN ISLAND AK	0441 UTC 3-28	1.35 FT
HOMER AK	0442 UTC 3-28	0.07 FT
DUTCH HARBOR AK	0444 UTC 3-28	1.41 FT
WHITTIER AK	0447 UTC 3-28	0.10 FT
EUREKA CA	0456 UTC 3-28	0.94 FT
SOUTH SPIT CA	0458 UTC 3-28	1.17 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD IMPACT THE 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.

A TSUNAMI ADVISORY MEANS THAT A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS IMMINENT... EXPECTED OR OCCURRING. 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.

THE ESTIMATED ARRIVAL TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

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NAWILIWILI          HAWAII          256 PM HST MARCH 27
HONOLULU            HAWAII          308 PM HST MARCH 27
HILO                 HAWAII          346 PM HST MARCH 27
    
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BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.



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**PTWC Hawaii Message #13**

WEHW40 PHEB 280604  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280704-  
 /T.CON.PHEB.TS.Y.0121.000000T0000Z-000000T0000Z/

TSUNAMI MESSAGE NUMBER 13  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 804 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI ADVISORY SUPPLEMENT...

THE TSUNAMI ADVISORY CONTINUES IN EFFECT FOR THE STATE OF HAWAII.

PRELIMINARY EARTHQUAKE PARAMETERS

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 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 0800 HST MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME			OBSERVED MAX	
	OF MEASUREMENT			TSUNAMI HEIGHT	
NIKOLSKI AK	0322	UTC	3-28	1.15	FT
KING COVE AK	0344	UTC	3-28	0.43	FT
YAKUTAT TG AK	0418	UTC	3-28	0.36	FT
SELDOVIA AK	0432	UTC	3-28	0.08	FT
AKUTAN ISLAND AK	0441	UTC	3-28	1.35	FT
HOMER AK	0442	UTC	3-28	0.07	FT
WHITIER AK	0447	UTC	3-28	0.10	FT
EUREKA CA	0456	UTC	3-28	0.94	FT
CRESCENT CITY TG CA	0506	UTC	3-28	1.16	FT
MONTEREY CA	0508	UTC	3-28	0.69	FT
SAND POINT AK	0508	UTC	3-28	0.49	FT
SANTA CRUZ CA	0509	UTC	3-28	0.75	FT
LANGARA TG BC	0510	UTC	3-28	0.75	FT
CRESCENT CITY CA	0511	UTC	3-28	1.24	FT
TOFINO BC	0512	UTC	3-28	1.38	FT
TRINIDAD CA	0512	UTC	3-28	1.61	FT
ELFIN COVE AK	0513	UTC	3-28	0.85	FT
LONG BEACH WA	0518	UTC	3-28	1.20	FT
POINT REYES TG CA	0518	UTC	3-28	0.88	FT
SEWARD AK	0518	UTC	3-28	0.30	FT
NEAH BAY TG WA	0521	UTC	3-28	0.50	FT
COLD BAY AK	0531	UTC	3-28	0.43	FT
WESTPORT WA	0531	UTC	3-28	0.90	FT
PORT SAN LUIS CA	0534	UTC	3-28	0.71	FT
CORDOVA AK	0540	UTC	3-28	2.85	FT
SITKA DOCK TG AK	0542	UTC	3-28	0.10	FT
PORT ORFORD OR	0548	UTC	3-28	2.82	FT
DUTCH HARBOR AK	0550	UTC	3-28	1.44	FT
SANTA BARBARA CA	0550	UTC	3-28	0.45	FT
SOUTH SPIT CA	0551	UTC	3-28	4.13	FT
KODIAK AK	0553	UTC	3-28	0.39	FT
CHARLESTON OR	0557	UTC	3-28	2.20	FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE

TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD IMPACT THE 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.

A TSUNAMI ADVISORY MEANS THAT A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE WATER IS IMMINENT... EXPECTED OR OCCURRING. 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.

THE ESTIMATED ARRIVAL TIMES IN HAWAII OF THE FIRST TSUNAMI WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST MARCH 27
HONOLULU	HAWAII	308 PM	HST MARCH 27
HILO	HAWAII	346 PM	HST MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #14**

WEHW40 PHEB 280704  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280804-  
 /T.CON.PHEB.TS.Y.0121.000000T0000Z-000000T0000Z/

TSUNAMI MESSAGE NUMBER 14  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 904 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI ADVISORY SUPPLEMENT...

THE TSUNAMI ADVISORY CONTINUES IN EFFECT FOR THE STATE OF HAWAII.

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE          9.0
* ORIGIN TIME        0800 HST MAR 27 2013
                    1800 UTC MAR 27 2013
* COORDINATES        20.2 NORTH 146.8 EAST
* DEPTH              19 MILES
* LOCATION            MARIANA ISLANDS REGION
    
```

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
YAKUTAT TG AK	0418 UTC 3-28	0.36 FT
SELDOVIA AK	0432 UTC 3-28	0.08 FT
AKUTAN ISLAND AK	0441 UTC 3-28	1.35 FT
HOMER AK	0442 UTC 3-28	0.07 FT
WHITTIER AK	0447 UTC 3-28	0.10 FT
EUREKA CA	0456 UTC 3-28	0.94 FT
MONTEREY CA	0508 UTC 3-28	0.69 FT
SANTA CRUZ CA	0509 UTC 3-28	0.75 FT

LANGARA TG BC	0510	UTC	3-28	0.75	FT
TRINIDAD CA	0512	UTC	3-28	1.61	FT
ELFIN COVE AK	0513	UTC	3-28	0.85	FT
LONG BEACH WA	0518	UTC	3-28	1.20	FT
POINT REYES TG CA	0518	UTC	3-28	0.88	FT
SEWARD AK	0518	UTC	3-28	0.30	FT
NEAH BAY TG WA	0521	UTC	3-28	0.50	FT
COLD BAY AK	0531	UTC	3-28	0.43	FT
WESTPORT WA	0531	UTC	3-28	0.90	FT
CORDOVA AK	0540	UTC	3-28	2.85	FT
SITKA DOCK TG AK	0542	UTC	3-28	0.10	FT
PORT ORFORD OR	0548	UTC	3-28	2.82	FT
DUTCH HARBOR AK	0550	UTC	3-28	1.44	FT
SANTA BARBARA CA	0550	UTC	3-28	0.45	FT
SOUTH SPIT CA	0551	UTC	3-28	4.13	FT
KODIAK AK	0553	UTC	3-28	0.39	FT
CHARLESTON OR	0557	UTC	3-28	2.20	FT
MONTEREY CA	0600	UTC	3-28	0.92	FT
ASTORIA TG OR	0605	UTC	3-28	0.39	FT
PORT ANGELES TG WA	0606	UTC	3-28	0.43	FT
TRINIDAD CA	0606	UTC	3-28	4.36	FT
LA HARBOR CA	0608	UTC	3-28	0.31	FT
LA JOLLA CA	0612	UTC	3-28	0.53	FT
TOFINO BC	0612	UTC	3-28	2.56	FT
KING COVE AK	0618	UTC	3-28	0.82	FT
SAN DIEGO NAVAL PIER CA	0623	UTC	3-28	0.73	FT
CRESCENT CITY TG CA	0636	UTC	3-28	2.43	FT
CRESCENT CITY CA	0636	UTC	3-28	2.36	FT
PORT SAN LUIS CA	0636	UTC	3-28	2.17	FT
SAND POINT AK	0638	UTC	3-28	0.92	FT
SANTA MONICA TG CA	0647	UTC	3-28	0.75	FT
PORT TOWNSEND WA	0653	UTC	3-28	0.39	FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE  
**TIDE LEVEL AT THE TIME OF MEASUREMENT.**

EVALUATION

A TSUNAMI HAS BEEN GENERATED WHICH COULD IMPACT THE 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.

A TSUNAMI ADVISORY MEANS THAT A TSUNAMI CAPABLE OF PRODUCING  
 STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR  
 THE WATER IS IMMINENT... EXPECTED OR OCCURRING. 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.

THE ESTIMATED ARRIVAL TIMES IN HAWAII OF THE FIRST TSUNAMI  
 WAVES ARE

NAWILIWILI	HAWAII	256 PM	HST	MARCH 27
HONOLULU	HAWAII	308 PM	HST	MARCH 27
HILO	HAWAII	346 PM	HST	MARCH 27

BULLETINS WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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**PTWC Hawaii Message #15**

WEHW40 PHEB 280805  
 TSUHWX  
 HIZ001>003-005>009-012>014-016>021-023>026-280905-  
 /T.CAN.PHEB.TS.Y.0122.000000T0000Z-000000T0000Z/

BULLETIN  
 TSUNAMI MESSAGE NUMBER 15  
 NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI  
 1005 PM HST WED MAR 27 2013

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

...TSUNAMI ADVISORY CANCELLATION...

THE TSUNAMI ADVISORY IS CANCELLED FOR THE STATE OF HAWAII  
 EFFECTIVE AT 1005 PM HST.

PRELIMINARY EARTHQUAKE PARAMETERS

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 \* MAGNITUDE 9.0  
 \* ORIGIN TIME 0800 HST MAR 27 2013  
 1800 UTC MAR 27 2013  
 \* COORDINATES 20.2 NORTH 146.8 EAST  
 \* DEPTH 19 MILES  
 \* LOCATION MARIANA ISLANDS REGION

OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME			OBSERVED MAX	
	OF MEASUREMENT			TSUNAMI HEIGHT	
MONTEREY CA	0508	UTC	3-28	0.69	FT
SANTA CRUZ CA	0509	UTC	3-28	0.75	FT
LANGARA TG BC	0510	UTC	3-28	0.75	FT
TOFINO BC	0512	UTC	3-28	1.38	FT
TRINIDAD CA	0512	UTC	3-28	1.61	FT
ELFIN COVE AK	0513	UTC	3-28	0.85	FT
LONG BEACH WA	0518	UTC	3-28	1.20	FT
POINT REYES TG CA	0518	UTC	3-28	0.88	FT
SEWARD AK	0518	UTC	3-28	0.30	FT
NEAH BAY TG WA	0521	UTC	3-28	0.50	FT
COLD BAY AK	0531	UTC	3-28	0.43	FT
WESTPORT WA	0531	UTC	3-28	0.90	FT
CORDOVA AK	0540	UTC	3-28	2.85	FT
SITKA DOCK TG AK	0542	UTC	3-28	0.10	FT
PORT ORFORD OR	0548	UTC	3-28	2.82	FT
DUTCH HARBOR AK	0550	UTC	3-28	1.44	FT
SANTA BARBARA CA	0550	UTC	3-28	0.45	FT
SOUTH SPIT CA	0551	UTC	3-28	4.13	FT
KODIAK AK	0553	UTC	3-28	0.39	FT
CHARLESTON OR	0557	UTC	3-28	2.20	FT
MONTEREY CA	0600	UTC	3-28	0.92	FT
ASTORIA TG OR	0605	UTC	3-28	0.39	FT
PORT ANGELES TG WA	0606	UTC	3-28	0.43	FT
TRINIDAD CA	0606	UTC	3-28	4.36	FT
LA HARBOR CA	0608	UTC	3-28	0.31	FT
LA JOLLA CA	0612	UTC	3-28	0.53	FT
TOFINO BC	0612	UTC	3-28	2.56	FT
KING COVE AK	0618	UTC	3-28	0.82	FT
SAN DIEGO NAVAL PIER CA	0623	UTC	3-28	0.73	FT
CRESCENT CITY TG CA	0636	UTC	3-28	2.43	FT
CRESCENT CITY CA	0636	UTC	3-28	2.36	FT
PORT SAN LUIS CA	0636	UTC	3-28	2.17	FT
SAND POINT AK	0638	UTC	3-28	0.92	FT
SANTA MONICA TG CA	0647	UTC	3-28	0.75	FT

PORT TOWNSEND WA

0653 UTC 3-28

0.39 FT

HEIGHT - OBSERVED MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE THE  
TIDE LEVEL AT THE TIME OF MEASUREMENT.

EVALUATION

BASED ON ALL AVAILABLE DATA THERE IS NO DESTRUCTIVE TSUNAMI  
THREAT TO THE STATE OF HAWAII. THEREFORE THE TSUNAMI ADVISORY FOR  
HAWAII IS CANCELLED.

HOWEVER... SOME COASTAL AREAS IN HAWAII COULD EXPERIENCE  
NON-DAMAGING SEA LEVEL CHANGES AND STRONG OR UNUSUAL CURRENTS  
LASTING FOR UP TO SEVERAL HOURS.

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

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Exercise

## Appendix E. Web-based WCATWC Products

### Tsunami Travel Times

Tsunami travel time contours in hours, beginning from the earthquake origin time.

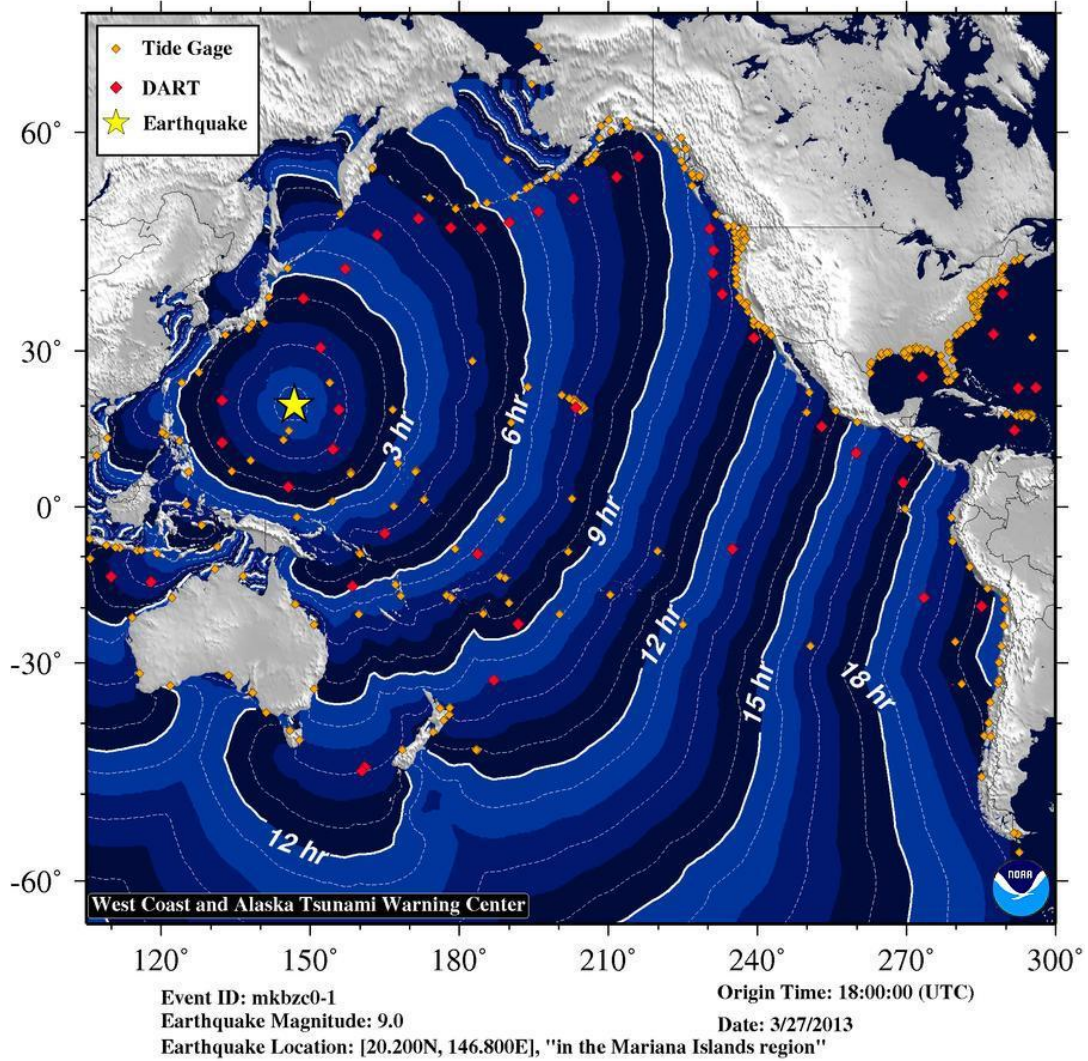
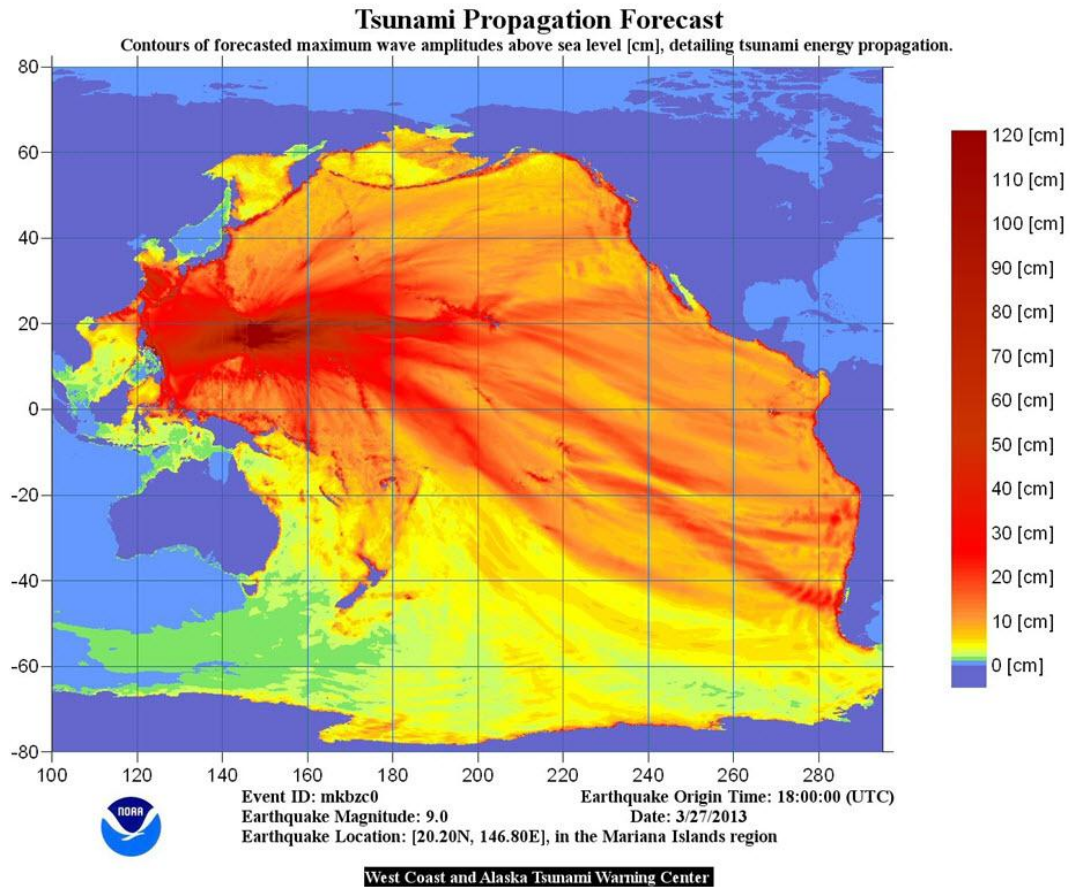


Figure E1: Tsunami Travel Time Map generated after issuing Bulletin 1.



**Figure E2: Tsunami Propagation Forecast Map generated after issuing Bulletin 3.**

EXE

## 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 27, 2013. 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 the 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 13, 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 sixth 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 in the Mariana Islands Region at 11:00 am Pacific Daylight Time *(or appropriate local time)* on March 27, 2013. 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](http://www.tsunami.gov). For more information on the NTHMP, see [nthmp.tsunami.gov](http://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