

**NATIONAL WEATHER SERVICE INSTRUCTION 10-701
MARCH 28, 2012**

**Operations and Services
TSUNAMI WARNING SERVICES, NWSPD 10-7**

TSUNAMI WARNING CENTER OPERATIONS

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SUMMARY OF REVISIONS: This supersedes NWS Instruction 10-701, dated April 10, 2009. Changes were made to structure the document toward the services provided by the Tsunami Warning Centers and address service changes following the September 29, 2009 tsunami in American Samoa, the February 28, 2010 tsunami in Chile, and the March 11, 2011 Japan tsunami.

1. Restructured document to more clearly define the services provided by the Tsunami Warning Centers.
2. Added a section describing VTEC usage.
3. Updated WC/ATWC Pacific breakpoints
4. Added tables describing regionalization and dissemination paths.
5. Converted product criteria format from text to tabular.
6. Added a section describing the procedure to issue experimental products.

<u>Signed</u>	<u>3/28/12</u>
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1. Tsunami Warning Centers

1.1 General

The West Coast/Alaska Tsunami Warning Center (WC/ATWC), located at Palmer, Alaska, and the Pacific Tsunami Warning Center (PTWC), located at Ewa Beach, Oahu, Hawaii, are responsible for the preparation and dissemination of tsunami warning, advisory, watch, and information products to their respective Area of Responsibility (AOR). The National Weather Service (NWS) operates and maintains Tsunami Warning Centers (TWCs) in Alaska and Hawaii which monitor observational networks, analyze earthquakes, evaluate sea level data, disseminate warnings, and coordinate with the National Tsunami Hazard Mitigation Program (NTHMP), government, academic, and international organizations. This function is further codified in the Tsunami Warning and Education Act of 2006, 33 U.S.C. § 3201, et seq., (P.L. 109-479).

TWC staff remains on call to react to earthquakes 24-hours a day. PTWC duty personnel respond either from within the Center or from government quarters located within 500 feet of the Center, and two persons are always available from within the PTWC. Currently, at the PTWC in Ewa Beach, HI, some PTWC bargaining unit personnel are required to live on the Center grounds in government quarters on a permanent basis, while others occupy quarters on a temporary basis only when they are on duty.

1.2 Area of Responsibility and Tsunami Source Region

A TWC's Area of Responsibility (AOR) is the region for which it is the authoritative Center to provide tsunami products. All tsunami warnings, advisories, watches, and information messages for any location in the AOR originate from the authoritative Center unless the TWCs are operating in backup mode. Figure 1a graphically shows the TWC AORs.

Each TWC also has a region, called its Tsunami Source Region (TSR), for which it has the primary responsibility for the detection and parameterization of large earthquakes and other potential tsunami sources for tsunami warning purposes. The USGS provides the final authoritative earthquake information. The TSR generally corresponds to places where a tsunami, if generated, would strike that Center's AOR first. Specifics of each Center's TSR are given below and shown in Figure 1b. The part of a Center's TSR that is in the U.S. or is immediately offshore is called its domestic TSR. Events in a Center's domestic TSR have special significance because of the local tsunami threat they may pose to U.S. coasts as well as the tsunami concern due to strong coastal shaking.

1.2.1 The WC/ATWC AOR and TSR

The WC/ATWC AOR is defined as the coasts and coastal waters of Canada, Puerto Rico, the Virgin Islands (U.S. and British), and all U.S. States except Hawaii. The WC/ATWC AOR is shown in detail in Section 3.1.

The WC/ATWC TSR is defined as: the Pacific north of 32.5°N and east of 170°E, the U.S. north of the Mexico border, all of the Bering Sea, the Arctic north of the Arctic Circle (66.5°N), the Atlantic, Europe, and Africa north of the Tropic of Cancer (23.5°N) and west of 45°E, the Gulf of Mexico, the region around Puerto Rico and the Virgin Islands (63.5°W to 68.25°W and 17°N to 21°N), and onshore areas of the contiguous U.S., Alaska, and Canada.

1.2.2 The PTWC AOR and TSR

The PTWC AOR is defined as the coasts and coastal waters of Hawaii, all US interests in the Pacific outside of Alaska, Washington, Oregon, and California, the Pacific coasts and coastal waters of countries participating in the Pacific Tsunami Warning and Mitigation System (PTWS), the Indian Ocean Tsunami Warning and Mitigation System (IOTWS), and the Caribbean and Adjacent Regions Tsunami and Other Coastal Hazards Early Warning System (CARIBE-EWS); excluding regions within the WC/ATWC AOR. International responsibilities and procedures are determined by agreement and in coordination with United Nations Educational, Scientific, and Cultural Organization (UNESCO) Intergovernmental Oceanographic Commission (IOC) tsunami programs and their Intergovernmental Coordination Groups (ICGs).

The PTWC TSR is defined as the region outside the WCATWC TSR and an area around Japan covered by the Northwest Pacific Tsunami Advisory Center (NWPTAC) of the Japan Meteorological Agency (JMA).



Figure 1a. TWC Areas of Responsibility – the coastal and offshore areas for which each TWC has the responsibility to issue operational tsunami products.

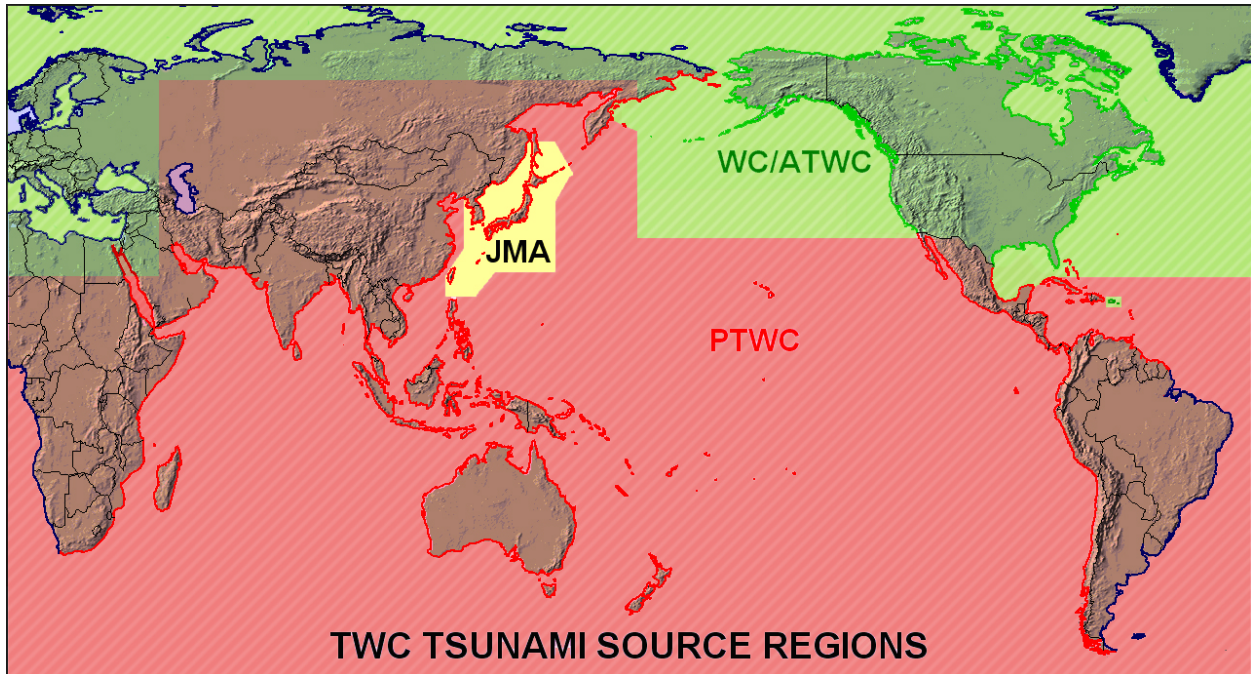


Figure 1b. TWC Tsunami Source Regions – the region for which a TWC has the primary responsibility for the detection and parameterization of large earthquakes and other potential tsunami sources for tsunami warning purposes.

1.3 Backup

1.3.1 Backup of the WC/ATWC

In the event that the WC/ATWC is disabled or otherwise unable to issue any of its critical products, the PTWC will issue those products on its behalf using the WC/ATWC product identifiers. The PTWC will have full authority to issue WC/ATWC products during a backup situation. The PTWC will issue these products when notified by the WC/ATWC that backup is necessary. The PTWC will also issue WC/ATWC products when a significant event has occurred, communications between the centers has ceased, and a time limit for the source region has been exceeded in which no critical products were issued by the WC/ATWC. Time limits will be determined by the TWCs based on source regions.

1.3.2 Backup of the PTWC

In the event that the PTWC is disabled or otherwise unable to issue any of its critical products, the WC/ATWC will issue those products on its behalf using the PTWC product identifiers. The WC/ATWC will have full authority to issue PTWC products during a backup situation. The WC/ATWC will issue these products when notified by the PTWC that backup is necessary. The WC/ATWC will also issue PTWC products when a significant event has occurred, communications between the centers has ceased, and a time limit for the source region has been exceeded in which no critical products were issued by the PTWC. Time limits will be determined by the TWCs based on source regions.

1.4 Guidance Bodies

1.4.1 The National Tsunami Hazard Mitigation Program

The National Tsunami Hazard Mitigation Program (NTHMP) is a partnership between NOAA, USGS, FEMA, U.S. Coastal States, territories and commonwealths. Its Warning Coordination Sub-Committee (WCS) is the main mechanism for response organizations within the United States to provide input to the National Oceanic and Atmospheric Administration's (NOAA's) operational Tsunami Warning System (TWS). WCS members formulate and agree to actions and recommendations regarding components of the TWS such as warning center products, warning procedures, message dissemination, system exercises, and Emergency Alert System (EAS) activation. Major changes, such as warning center products, will be proposed through the WCS; vetted through the NWS service change process; and the NWS Directive and Instruction system modified as appropriate. Minor changes proposed and approved through the WCS will be implemented by the TWCs. Significant changes to TWS operations considered by the NWS are coordinated with the WCS.

1.4.2 The UNESCO Intergovernmental Oceanographic Commission (IOC)

The IOC, its Intergovernmental Coordination Groups (ICGs) for the Pacific Ocean, Indian Ocean, Caribbean Sea, and Northeast Atlantic/Mediterranean Sea Tsunami Systems, and their Working Groups and Task Teams are the primary mechanism for International input into NOAA's operational TWS. International responsibilities of the U.S. TWCs are determined by agreement and in coordination with IOC tsunami programs. Significant changes to TWC international products are made in coordination with the appropriate ICG or Member State affected before implementation.

The International Tsunami Information Center (ITIC) is a joint partnership of UNESCO IOC and NOAA. ITIC supports the Pacific system and other systems globally to assist countries in establishing and strengthening their national and regional systems, and in training and capacity building to ensure timely delivery and understanding of warnings to countries and communities. ITIC is administratively overseen by the NWS Pacific Region. More information on the ITIC's and tsunami international program responsibilities can be found in NWSI 10-702 (International Tsunami Information Center) and 10-703 (Post-Tsunami Surveys).

1.4.3 State Tsunami Hazard Committees

TWCs will work with U.S. state/territory-level tsunami hazard committees within their AORs to better prepare the states/territories for tsunami warning, advisory, or watch response. Proposals from state/territory tsunami hazard committees concerning changes to the operational TWS are introduced through the NTHMP WCS for consideration. Routine interactions such as exercises and EAS planning do not require coordination through the WCS.

2. TWC Products

2.1 Domestic Product Definitions

2.1.1 Tsunami Warning

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

2.1.2 Tsunami Advisory

A tsunami advisory is issued when a tsunami with the potential to generate strong currents or waves dangerous to those in or very near the water is imminent, expected, or occurring. The threat may continue for several hours after initial arrival, but significant inundation is not expected for areas under an advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbors and marinas, and the repositioning of ships to deep waters when there is time to safely do so. Advisories are normally updated to continue the advisory, expand/contract affected areas, upgrade to a warning, or cancel the advisory.

2.1.3 Tsunami Watch

A tsunami watch is issued to alert emergency management officials and the public of an event which may later impact the watch area. The watch area may be upgraded to a warning or advisory - or canceled - based on updated information and analysis. Therefore, emergency management officials and the public should prepare to take action. Watches are normally issued based on seismic information without confirmation that a destructive tsunami is underway.

2.1.4 Tsunami Information Statement

A tsunami information statement is issued to inform emergency management officials and the public that an earthquake has occurred, or that a tsunami warning, watch or advisory has been issued for another section of the ocean. In most cases, information statements are issued to indicate there is no threat of a destructive basin wide tsunami and to prevent unnecessary evacuations as the earthquake may have been felt in coastal areas. An information statement may, in appropriate situations, caution about the possibility of destructive local tsunamis. Information statements may be re-issued with additional information, though normally these messages are not updated. However, a watch, advisory or warning may be issued for the area, if necessary, after analysis and/or updated information becomes available.

This definition applies to Mass News Dissemination Product Types, Tsunami Information Statements, and Tsunami Seismic Information Statements.

2.1.5 Cancellation

This is a final product indicating the end of the damaging tsunami threat. A cancellation is usually issued after an evaluation of sea level data confirms that a destructive tsunami will not impact the warning, advisory, or watch area.

2.2 International Product Definitions

International tsunami product definitions are defined in accordance with protocols agreed to by the regional UNESCO/IOC ICGs. For all regions, the international TWC products are issued only as advice to designated national authorities. They are not intended as advice to the public

although they may be disseminated to the public through news organizations and are publicly available through the TWC websites. For the Pacific, PTWC will issue warnings, watches, and information bulletins to its international AOR. WC/ATWC will also issue its domestic product for the west coast of Canada. For the Indian Ocean and Caribbean Sea, the PTWC will issue only watches and information. This is in accordance with protocols agreed to by the ICGs for their regions. The current lack of validated forecast model guidance for all international coasts within the TWCs except Canada prevents more fine scale distinctions such as those differentiating an advisory from a warning. Although the IOC is working to harmonize terms and their definitions across all ICGs this work is still incomplete.

International product definitions are agreed upon through individual ICGs. International Product definitions can be found in the User Guides listed in Section 6.

2.3 Product Codes and Names

Figure 2 lists all products issued by the TWCs along with their WMO Code, Advanced Weather Interactive Processing System (AWIPS) Code, Product Name, and region.

Tsunami Products and Product Codes
 NOAA Pacific Tsunami Warning Center (PTWC, PHEB)
 NOAA West Coast / Alaska Tsunami Warning Center (WC/ATWC, PAAQ)

TWC	WMO/AWIPS Product Codes	Product Name	Product Explanation	Coverage
PTWC	WEPA40 PHEB TSUPAC	Tsunami Bulletin	Tsunami Warnings and Watches [$> M7.5$]; Test	Pacific
	WEPA42 PHEB TIBPAC	Tsunami Bulletin	Tsunami Information Bulletin [M6.5 to 7.5]	
	WEHW40 PHEB TSUHWX	Tsunami Message	Tsunami Warning, Watch, or Advisory for Hawaii Civil Defense [Hawaii source, $> M6.8$; Pacific source, $> M7.5$]	Hawaii
	WEHW42 PHEB TIBHWX	Tsunami Information Statement	Tsunami Information Statement for Hawaii Civil Defense [Pacific source, M6.5 to 7.5]	
	SEHW70 PHEB EQIHWX	Tsunami Seismic Information Statement	Tsunami Seismic Information Statement [Hawaii source, up to M6.8]	
	WEHW50 PHEB TSUHW1	Public Tsunami Message	Public Tsunami Warnings [Hawaii source, $> M6.8$]	
	WECA41 PHEB TSUCAX	Tsunami Message	Tsunami Watch [$> M7.0$; Atlantic source $> M7.8$]; Test	Caribbean
	WECA43 PHEB TIBCAX	Tsunami Information Statement	Tsunami Information Statement [M6.0 to 7.0; Atlantic source M6.5 to 7.8]	
	WEIO21 PHEB TSUIOX	Tsunami Bulletin	Tsunami Watch [$> M7.0$]; Test	Indian Ocean
	WEIO23 PHEB TIBIOX	Tsunami Bulletin	Tsunami Information Bulletin [M6.5 to 7.0]	
WC/ATWC	WEPA41 PAAQ TSUWCA	Tsunami Message	Tsunami Warnings, Watches, and Advisories [$> M7.0$]; Test	Alaska, British Columbia, Canada, and US West Coast
	WEPA43 PAAQ TIBWCA	Tsunami Information Statement	Tsunami Information Statement [M6.5 to 7.0]	
	WEAK51 PAAQ TSUAK1	Public Tsunami Message	Public Tsunami Warnings, Watches, and Advisories [$> M7.0$]	
	WEAK53 PAAQ TIBAK1	Public Tsunami Information Statement	Public Tsunami Information Statement [M6.5 to 7.0]	
	SEAK71 PAAQ EQIAKX	Tsunami Seismic Information Statement	Tsunami Seismic Information Statement [Alaska, $< M6.5$]	
	SEUS71 PAAQ EQIWOC	Tsunami Seismic Information Statement	Tsunami Seismic Information Statement [US West Coast & BC, $< M6.5$]	
	WEXX20 PAAQ TSUAT1	Tsunami Message	Tsunami Warnings, Watches, and Advisories [$> M6.4$]; Test	Puerto Rico/Virgin Islands, US East, Gulf, and Eastern Canadian Provinces
	WEXX22 PAAQ TIBAT1	Tsunami Information Statement	Tsunami Information Statement [M6.0 to 6.4]	
	WEXX30 PAAQ TSUATE	Public Tsunami Message	Public Tsunami Warnings, Watches, and Advisories [$> M6.4$]	
	WEXX32 PAAQ TIBATE	Public Tsunami Information Statement	Public Tsunami Information Statement [M6.0 to 6.4]	
SEXX60 PAAQ EQIAT1	Tsunami Seismic Information Statement	Tsunami Seismic Information Statement [$< M6$]		

Table 1. TWC products and product codes

2.4 Break Points/Warning Zones

2.4.1 WC/ATWC Break Points

The geographical extent of tsunami warnings, watches and advisories in the WC/ATWC's Pacific AOR are defined by breakpoints which correspond with NWS public zone boundaries:

Attu, AK	Salisbury Sound, AK	Horse Mountain, CA
Amchitka Pass, AK	Cape Decision, AK	Gualala Point, CA
Nikolski, AK	BC/Alaska Border	Davenport, CA
Unimak Pass, AK	North Tip Vancouver Island, BC	Ragged Point, CA
Chignik Bay, AK	Washington/BC Border	Point Conception, CA
Kennedy Entrance, AK	Oregon/Washington Border	Rincon Point, CA
Hinchinbrook Entrance, AK	Cascade Head, OR	Alamitos Bay, CA
Cape Suckling, AK	Douglas/Lane County Line, OR	Mexico/California Border
Cape Fairweather, AK	California/Oregon Border	

The geographical extent of tsunami warnings, watches, and advisories in the WC/ATWC's Atlantic AOR are defined by breakpoints which correspond with NWS WFO AORs:

Brownsville, TX	Ocean Reef, FL	Watch Hill, RI
Baffin Bay, TX	Jupiter Inlet, FL	Merrimack River, MA
Port O'Connor, TX	Flagler Beach, FL	Stonington, ME
High Island, TX	Altamaha Sound, GA	US/Canada Border
Morgan City, LA	South Santee River, SC	Charlesville, NS
MS/AL Border	Surf City, NC	Chezzetcook, NS
Destin, FL	Duck, NC	Meat Cove, NS
Suwannee River, FL	New Point Comfort, VA	Cape Ray, NL
Bonita Beach, FL	Cape Henlopen, DE	La Manche, NL
Flamingo, FL	Sandy Hook, NJ	Boat Harbour, NL
		Cape Chidley, NL

There are no breakpoints defined for Puerto Rico and the Virgin Islands as they are included in warnings, watches, and advisories as separate entities.

2.4.2 PTWC Warning Zones

2.4.2.1 Hawaii Product

For teletsunamis generated outside of the State of Hawaii and its coastal waters, warnings, watches, and advisories will be issued to the entire State of Hawaii.

For local tsunamis generated within the State of Hawaii and its coastal waters, warnings will be issued to one or more of the following:

The Big Island (Hawaii County)

Maui County

Oahu

Kauai County

All counties in the State of Hawaii

2.4.2.2 PTWS Products

The geographical extent of tsunami warnings and watches issued by PTWC for the PTWS will be defined using the following warning zones. The zones are delineated no finer than individual countries, territories, or other entities in accordance with PTWS protocols and represent only coasts bordering the oceans or seas covered by the PTWS. The level of alert assigned will be the highest level determined for any part of the covered coast of that entity:

American Samoa	Howland-Baker Is.	Panama
Antarctica	Indonesia	Papua New Guinea
Australia	Japan	Peru
Belau	Jarvis Is.	Philippines
Brunei	Johnston Is.	Pitcairn
Cambodia	Kermadec Is	Pohnpei
Chile	Kiribati	Russia
China	Kosrae, FSM	Samoa
Chuuk,FSM	Malaysia	Singapore
Colombia	Marcus Is.	Solomon Is.
Cook Islands	Marshall Is.	Taiwan
Costa Rica	Mexico	Thailand
Ecuador	Midway Is.	Tokelau
El Salvador	N. Marianas Is.	Tonga
Fiji	Nauru	Tuvalu
Fr. Polynesia	New Caledonia	Vanuatu
Guam	New Zealand	Vietnam
Guatemala	Nicaragua	Wake Is.
Hawaii	Niue	Wallis-Futuna
Honduras	Palmyra Is.	Yap

2.4.2.3 IOTWS Products

The geographical extent of tsunami warnings and watches issued by PTWC for the IOTWS will be defined using the following warning zones. The zones are delineated no finer than individual countries, territories, or other entities in accordance with IOTWS protocols and represent only

coasts bordering the oceans or seas covered by the IOTWS. The level of alert assigned will be the highest level determined for any part of the covered coast of that entity:

Australia	Madagascar	Singapore
Bangladesh	Malaysia	Somalia
Comores	Maldives	South Africa
Crozet Islands	Mauritius	Sri Lanka
East Timor	Mozambique	Tanzania
India	Myanmar	Thailand
Indonesia	Oman	UAE
Iran	Pakistan	United Kingdom
Kenya	Reunion	Yemen
Kerguelen Islands	Seychelles	

2.4.2.4 CARIBE-EWS Products

The geographical extent of tsunami warnings and watches issued by PTWC for the CARIBE-EWS will be defined using the following warning zones. The zones are delineated no finer than individual countries, territories, or other entities in accordance with CARIBE-EWS protocols and represent only coasts bordering the oceans or seas covered by the CARIBE-EWS. The level of alert assigned will be the highest level determined for any part of the covered coast of that entity:

Anguilla	Dominica	Puerto Rico
Antigua	Dominican Rep	Saba
Aruba	French Guiana	Saint Kitts
Bahamas	Grenada	Saint Lucia
Barbados	Guadeloupe	Saint Maarten
Barbuda	Guatemala	Saint Martin
Belize	Guyana	St Vincent
Bermuda	Haiti	Suriname
Bonaire	Honduras	Trinidad and Tobago
Brazil	Jamaica	Turks and Caicos
Cayman Islands	Martinique	US Virgin Is
Colombia	Mexico	Venezuela
Costa Rica	Montserrat	
Cuba	Nicaragua	
Curacao	Panama	

2.5 Product Content

Appendix A provides examples of the products issued by each of the Centers. Products include both standard and public products. Standard products contain tables and segments and are designed for emergency management and weather information providers or for the tsunami-responsible agencies of other countries in the case of the international products. Public products are designed for the general public and are easier to read than standard products. Public products

are WEAK51 PAAQ, WEAK53 PAAQ, WEXX30 PAAQ, WEXX32 PAAQ, and WEHW50 PHEB.

2.5.1 Product Format

TWC domestic products will conform to NWS text product format standards (reference National Weather Service Instruction (NWSI) 10-1701 and 10-1702 on product format). Table 2 indicates whether the products contain Valid Time Event Codes (VTEC), Universal Geographic Codes (UGCs), and whether or not they are segmented.

Product	VTEC	Marine UGC	Public UGC	Segmented
WEPA41 PAAQ	X		X	X
WEXX20 PAAQ	X	X	X	X
WEHW40 PHEB, WEHW42 PHEB	X		X	
SEHW70 PHEB, WEHW50 PHEB			X	
WEPA43 PAAQ, WEXX22 PAAQ, WEAK51 PAAQ, WEAK53 PAAQ, WEXX30 PAAQ, WEXX32 PAAQ, SEAK71 PAAQ, SEUS71 PAAQ, SEXX60 PAAQ, WEPA40 PHEB, WEPA42 PHEB, WEIO21 PHEB, WEIO23 PHEB, WECA41 PHEB, WECA43 PHEB				

Table 2. TWC products and related UGC/VTEC information.

Domestic warning, advisory, and watch messages contain the following information (an example is provided for each):

Product header: Standard NWS header with WMO and AWIPS codes

Examples:

WEPA41 PAAQ 272039
TSUWCA

WEPA40 PHEB 272039
TSUPAC

For non-segmented domestic products, UGCs will be listed below the AWIPS codes; e.g.,
SEHW70 PHEB 200404
EQIHWX

HIZ001>003-005>009-012>014-016>021-023>026-200604-

Mass news disseminator (MND) header: The standard NWS MND header is used for domestic products and Caribbean products. Indian Ocean and Pacific TWS products use slight variations of the MND format.

Examples of domestic and Caribbean product MND header:

BULLETIN
TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
139 PM PDT TUE JUL 27 2010

TSUNAMI INFORMATION STATEMENT NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
417 AM HST MON JUN 02 2008

TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
2203 UTC TUE JAN 12 2010

THIS MESSAGE APPLIES TO COUNTRIES WITHIN AND BORDERING THE
CARIBBEAN SEA...EXCEPT FOR PUERTO RICO AND THE VIRGIN ISLANDS.

Examples of Pacific and Indian Ocean international product header:

BULLETIN
TSUNAMI BULLETIN NUMBER 001
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1426Z 02 JUN 2008

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

TSUNAMI BULLETIN NUMBER 001
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1449Z 25 OCT 2010

THIS BULLETIN IS FOR ALL AREAS OF THE INDIAN OCEAN.

Changes since last message (if supplemental message): Short description of changes within
message since last message

Examples:

UPDATES IN THIS MESSAGE INCLUDE AN EXPANDED ADVISORY
REGION AND AN OBSERVED TSUNAMI IN PUERTO RICO.

UPDATES IN THIS MESSAGE INCLUDE A REVISED MAGNITUDE.

Headline(s): For domestic warning, watch, and advisories, areas in an alert. For international
warnings and watches, a statement and a warning and/or watch are in effect.

Examples (domestic):

...A TSUNAMI WARNING IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF CALIFORNIA AND OREGON FROM RAGGED POINT
CALIFORNIA/45 MILES NW OF SAN LUIS OBISPO/ TO CASCADE HEAD
OREGON/70 MILES SW OF PORTLAND/...

...A TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO
BORDER TO RAGGED POINT CALIFORNIA/45 MILES NW OF SAN LUIS
OBISPO/...

...THIS TSUNAMI INFORMATION STATEMENT IS FOR PUERTO RICO/
THE VIRGIN ISLANDS/ THE U.S. ATLANTIC AND GULF OF
MEXICO STATES/ AND EASTERN CANADIAN PROVINCES...

...AN URGENT TSUNAMI WARNING IS NOW IN EFFECT FOR THE BIG ISLAND
AND MAUI COUNTY...

...A TSUNAMI WATCH IS NOW IN EFFECT FOR THE STATE OF HAWAII...

...TSUNAMI INFORMATION STATEMENT...

Examples (international):

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

A TSUNAMI WARNING IS IN EFFECT FOR

JAPAN / RUSSIA / MARCUS IS.

A TSUNAMI WATCH IS IN EFFECT FOR

N. MARIANAS / GUAM / WAKE IS. / TAIWAN / YAP / PHILIPPINES / MARSHALL IS. /
CHUUK / POHNPEI / BELAU / MIDWAY IS. / KOSRAE / INDONESIA / PAPUA NEW GUINEA /
NAURU / HAWAII

... A LOCAL TSUNAMI WATCH IS IN EFFECT ...

A TSUNAMI WATCH IS IN EFFECT FOR

INDIA / INDONESIA

FOR OTHER AREAS OF THE INDIAN OCEAN REGION...THIS MESSAGE IS FOR
INFORMATION ONLY AT THIS TIME.

... A LOCAL TSUNAMI WATCH IS IN EFFECT ...

A TSUNAMI WATCH IS IN EFFECT FOR

HAITI / CUBA / BAHAMAS / DOMINICAN REP

FOR OTHER AREAS OF THE CARIBBEAN COVERED BY THIS MESSAGE...IT IS
FOR INFORMATION ONLY AT THIS TIME.

... TSUNAMI INFORMATION STATEMENT ...

Recommended Actions or Evaluation: This section defines the likelihood of a tsunami and any recommended actions.

Examples (domestic):

RECOMMENDED ACTIONS

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

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

EVALUATION

BASED ON MAGNITUDE... LOCATION AND HISTORIC TSUNAMI RECORDS THE EARTHQUAKE WAS NOT SUFFICIENT TO GENERATE A TSUNAMI DAMAGING TO CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA OR ALASKA. SOME OF THESE AREAS MAY EXPERIENCE NON-DAMAGING SEA LEVEL CHANGES. IN COASTAL AREAS OF INTENSE SHAKING LOCALLY GENERATED TSUNAMIS CAN BE TRIGGERED BY UNDERWATER LANDSLIDES.

EVALUATION

A MAGNITUDE 7.2 EARTHQUAKE OCCURRED TUESDAY AT 1121AM HAWAIIAN STANDARD TIME OFF THE KONA COAST OF THE BIG ISLAND. THIS EARTHQUAKE HAS THE POTENTIAL TO HAVE GENERATED A DESTRUCTIVE TSUNAMI.

EVALUATION

A MAGNITUDE 8.2 EARTHQUAKE OCCURRED SATURDAY AT 315PM HAWAIIAN STANDARD TIME IN THE KURIL ISLANDS. A TSUNAMI WAS GENERATED BY THIS EARTHQUAKE WITH THE POTENTIAL TO BE A HAZARD IN THE STATE OF HAWAII.

RECOMMENDED ACTIONS

PERSONS ALONG ALL COASTS OF THE BIG ISLAND AND MAUI COUNTY ARE URGED TO MOVE IMMEDIATELY TO HIGHER GROUND AT LEAST 30 FEET ABOVE SEA LEVEL...TO THE 3RD FLOOR OR ABOVE IN A STEEL OR CONCRETE BUILDING...OR AT LEAST HALF A MILE INLAND DUE TO THE POTENTIAL FOR IMMINENT FLOODING OF THE COAST BY TSUNAMI WAVES. PERSONS SHOULD STAY THERE UNTIL AN ALL CLEAR FOR THEIR AREA IS ISSUED BY CIVIL DEFENSE.

RECOMMENDED ACTIONS

TUNE TO LOCAL RADIO OR TELEVISION STATIONS FOR FURTHER INSTRUCTIONS.

NO ACTION IS REQUIRED.

Examples (international):

This following statement can be inserted in international products:

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.

EVALUATION

A DESTRUCTIVE WIDESPREAD TSUNAMI THREAT DOES NOT EXIST BASED ON HISTORICAL EARTHQUAKE AND TSUNAMI DATA.

HOWEVER - THERE IS THE POSSIBILITY OF A LOCAL TSUNAMI THAT COULD AFFECT COASTS LOCATED USUALLY NO MORE THAN A HUNDRED KILOMETERS FROM THE EARTHQUAKE EPICENTER. AUTHORITIES FOR THE REGION NEAR THE EPICENTER SHOULD BE AWARE OF THIS POSSIBILITY. AREAS FURTHER FROM THE EPICENTER COULD EXPERIENCE SMALL SEA LEVEL CHANGES AND STRONG OR UNUSUAL COASTAL CURRENTS.

EVALUATION

EARTHQUAKES OF THIS SIZE HAVE THE POTENTIAL TO GENERATE A DESTRUCTIVE LOCAL TSUNAMI AND SOMETIMES A DESTRUCTIVE REGIONAL TSUNAMI ALONG COASTS LOCATED USUALLY NO MORE THAN A THOUSAND KILOMETERS FROM THE EARTHQUAKE EPICENTER. AREAS FURTHER FROM THE EPICENTER COULD EXPERIENCE SMALL SEA LEVEL CHANGES AND STRONG OR UNUSUAL COASTAL CURRENTS.

HOWEVER - IT IS NOT KNOWN THAT A TSUNAMI WAS GENERATED. THIS WATCH IS BASED ONLY ON THE EARTHQUAKE EVALUATION. AUTHORITIES IN THE REGION SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THE WATCH WILL NOT EXPAND TO OTHER AREAS OF THE INDIAN OCEAN UNLESS ADDITIONAL DATA ARE RECEIVED TO WARRANT SUCH AN EXPANSION.

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 GAUGES NEAR THE EARTHQUAKE TO DETERMINE IF A TSUNAMI WAS GENERATED AND ESTIMATE THE SEVERITY OF THE THREAT.

EVALUATION

SEA LEVEL READINGS CONFIRM THAT A TSUNAMI HAS BEEN GENERATED WHICH COULD CAUSE WIDESPREAD DAMAGE. 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 WAVE HEIGHTS CANNOT BE PREDICTED AND CAN VARY SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE TSUNAMI 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 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 WAVE ACTION THE ALL CLEAR DETERMINATION WILL BE MADE BY LOCAL AUTHORITIES.

Tsunami warning, watch, or advisory explanation (definition): Tsunami warning, advisory, or watch definitions are required in warning, advisory, and watch products. A definition is not required in the information statement.

Examples:

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

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

THIS TSUNAMI WARNING MEANS THE POTENTIAL FOR DANGEROUS COASTAL FLOODING AND POWERFUL OCEAN CURRENTS ALONG COASTS OF THE BIG ISLAND AND MAUI COUNTY IS IMMINENT. 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 CAN VARY GREATLY FROM ONE STRETCH OF COAST TO THE NEXT. THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI WAVES EFFICIENTLY WRAP AROUND ISLANDS. ALL SHORES ARE AT RISK NO MATTER WHICH DIRECTION THEY FACE. THE TROUGH OF A TSUNAMI WAVE 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.

THIS TSUNAMI ADVISORY MEANS THAT A TSUNAMI...WITH THE POTENTIAL TO GENERATE STRONG OCEAN CURRENTS OR WAVES DANGEROUS TO THOSE IN OR VERY NEAR THE WATER...IS EXPECTED ALONG COASTS OF THE STATE OF HAWAII BEGINNING TODAY AROUND 1245PM HAWAIIAN STANDARD TIME. THE THREAT MAY

CONTINUE FOR SEVERAL HOURS BUT SIGNIFICANT INUNDATION IS NOT EXPECTED.

Reference to the other center's actions:

Examples:

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

CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR ALASKA...BRITISH COLUMBIA...WASHINGTON...OREGON...CALIFORNIA. THAT CAN BE FOUND ON THE INTERNET AT WCATWC.ARH.NOAA.GOV.

THE WEST COAST/ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR PUERTO RICO AND THE VIRGIN ISLANDS THAT CAN BE FOUND ON THE INTERNET AT WCATWC.ARH.NOAA.GOV.

THE JAPAN METEOROLOGICAL AGENCY MAY ALSO ISSUE TSUNAMI MESSAGES FOR THIS EVENT TO COUNTRIES IN THE NORTHWEST PACIFIC AND SOUTH CHINA SEA REGION. IN CASE OF CONFLICTING INFORMATION...THE MORE CONSERVATIVE INFORMATION SHOULD BE USED FOR SAFETY.

Follow-up message information:

Examples:

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

BULLETINS WILL BE ISSUED HOURLY OR SOONER IF CONDITIONS WARRANT. THE TSUNAMI WARNING AND WATCH WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. THIS PRODUCT AND ADDITIONAL INFORMATION CAN BE FOUND ON THE INTERNET AT WWW.WEATHER.GOV/PTWC.

Content Type Separator Codes: The NWS Content-Type Separator Code (&&) can be inserted before the Tsunami Observations and Forecasts, and the Earthquake Parameters sections.

Tsunami Observations and Forecasts:

Tsunami observations and forecast arrival times and amplitudes are listed in the main body of warning, advisory, and watch products. The TWCs will formulate tsunami amplitude forecasts

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taking into account the limitations and constraints of seismic, sea level, and any other available data. The TWCs will provide specific numerical forecast amplitudes only when justified by sea level observations. Tsunami amplitude is defined as the elevation of the wave above ambient sea level, and is the maximum amplitude expected for the duration of the event. Listed observation/forecast points are grouped by countries, states, territories, or islands. The forecast/observed amplitude column(s) can be removed when no forecasts are issued/ observations reported. The estimated arrival times column can be removed when the tsunami has passed or in the cancellation product. An observation time column can be included in cancellations. Products intended for domestic audiences will list the arrival time in local time and amplitudes in feet first then meters. Products intended for international audiences will list the time in UTC and amplitudes in meters first then feet. Products may specify ranges for forecast amplitudes versus exact values and may provide a level of uncertainty.

Example of a Tsunami Observation and Forecast list for a domestic audience.

MEASUREMENTS AND/OR FORECASTS OF TSUNAMI ACTIVITY

ESTIMATED ARRIVAL TIMES OF THE INITIAL TSUNAMI WAVE AT LOCATIONS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR. FORECAST AMPLITUDES GIVEN BELOW ARE PRELIMINARY ESTIMATES OF THE MAXIMUM FORECASTED FOR THIS TSUNAMI AND ARE BASED ON NUMERICAL MODELS.

SITE	LAT	LON	ARRIVAL TIME	FCST AMP	OBS AMP
CANADA					
HALIFAX-NS	44.7N	63.6W	2018EDT JUL 27	6.6F/2.0M	6.8F/2.1M
LOCKEPORT-NS	43.7N	65.1W	2244ADT JUL 27		3.3F/1.0M
NEW YORK					
MONTAUK	41.1N	72.0W	2150EDT JUL 27	1.2F/0.4M	
VIRGINIA					
VIRGINIA BCH	36.9N	76.0W	2150EDT JUL 27	1.5F/0.5M	

LAT - LATITUDE/ N-NORTH, S-SOUTH/
 LON - LONGITUDE/ E-EAST, W-WEST/
 ARRIVAL TIME - EXPECTED TIME OF INITIAL TSUNAMI ARRIVAL
 FCST AMP - FORECAST TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
 OBS AMP - OBSERVED TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS/M/ AND FEET/F/.

MEASUREMENTS AND/OR FORECASTS OF TSUNAMI ACTIVITY

ESTIMATED ARRIVAL TIMES OF THE INITIAL TSUNAMI WAVE AT LOCATIONS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR. FORECAST AMPLITUDES GIVEN BELOW ARE PRELIMINARY ESTIMATES OF THE MAXIMUM FORECASTED FOR THIS TSUNAMI AND ARE BASED ON NUMERICAL MODELS.

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SITE	LAT	LON	ARRIVAL TIME	FCST AMP	OBS AMP
BIG ISLAND					
HILO	19.7N	155.1W	1118HST MAY 27	6.6F/2.0M	6.8F/2.1M
KAWAIHAE	20.0N	155.8W	1124HST MAY 27		3.3F/1.0M
MAUI					
KAHULUI	20.9N	156.5W	1150HST MAY 27	1.2F/0.4M	
OAHU					
HONOLULU	21.3N	157.9W	1152HST MAY 27	1.5F/0.5M	
KAUAI					
NAWILIWILI	22.0N	159.4W	1201HST MAY 27	1.2F/0.4M	

LAT - LATITUDE /N-NORTH, S-SOUTH/
 LON - LONGITUDE /E-EAST, W-WEST/
 ARRIVAL TIME - EXPECTED TIME OF INITIAL TSUNAMI ARRIVAL
 FCST AMP - FORECAST TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
 OBS AMP - OBSERVED TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
 IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
 VALUES ARE GIVEN IN BOTH METERS/M/ AND FEET/F/.

Example of a Tsunami Observation and Forecast list for an international audience.

ESTIMATED INITIAL TSUNAMI WAVE 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. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
JAPAN	KATSUURA	35.0N 140.3E	1502Z 02 JUN
	KUSHIRO	42.9N 144.3E	1504Z 02 JUN
	HACHINQHE	40.5N 141.7E	1508Z 02 JUN
	SHIMIZU	32.8N 133.0E	1625Z 02 JUN
	OKINAWA	26.2N 127.8E	1719Z 02 JUN
RUSSIA	URUP IS	46.1N 150.5E	1538Z 02 JUN
	PETROPAVLOVSK K	53.2N 159.6E	1646Z 02 JUN
	SEVERO KURILSK	50.8N 156.1E	1650Z 02 JUN
	UST KAMCHATSK	56.1N 162.6E	1708Z 02 JUN
	MEDNNY IS	54.7N 167.4E	1709Z 02 JUN

Example of a Tsunami Observation list used in a domestic product cancellation. In an international product, UTC is used and meters precede feet.

MEASUREMENTS OF TSUNAMI ACTIVITY

SITE	LAT	LON	OBS TIME	OBS AMP
CALIFORNIA				
CRESCENT CITY	41.7N	124.2W	1307PDT JUL 27	6.8F/2.1M
SAN FRANCISCO	37.8N	122.5W	1345PDT JUL 27	3.4F/1.5M
SANTA BARBARA	34.4N	119.7W	1443PDT JUL 27	3.0F/0.9M
SAN PEDRO	33.7N	118.3W	1459PDT JUL 27	2.6F/0.8M
LA JOLLA	32.9N	117.3W	1513PDT JUL 27	2.0F/0.6M
OREGON				
CHARLESTON	43.3N	124.3W	1333EDT JUL 27	4.6F/1.5M
SEASIDE	46.0N	123.9W	1449PDT JUL 27	6.8F/2.1M
WASHINGTON				

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WESTPORT 46.9N 124.1W 1500PDT JUL 27 4.6F/1.5M
NEAH BAY 48.4N 124.6W 1510PDT JUL 27 6.8F/2.1M
BRITISH COLUMBIA
TOFINO 49.2N 125.9W 1520PDT JUL 27 3.2F/1.0M

LAT - LATITUDE/ N-NORTH, S-SOUTH/
LON - LONGITUDE/ E-EAST, W-WEST/
OBS TIME - TIME OF OBSERVED AMPLITUDE
OBS AMP - OBSERVED TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS/M/ AND FEET/F/.

Earthquake Parameters: Preliminary earthquake hypocentral parameters. When required to ensure understandability of a message, the Public product version of this information may be moved to the Evaluation section above.

Examples (Standard domestic product):

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1207 AKDT 27 JUL 2010
1307 PDT 27 JUL 2010
2007 UTC 27 JUL 2010
COORDINATES - 40.0 NORTH 124.5 WEST
DEPTH - 9 MILES/15 KM
LOCATION - 55 MILES/89 KM SW OF EUREKA CALIFORNIA, *or*
OFF THE COAST OF NORTHERN CALIFORNIA
MAGNITUDE - 7.7

Examples (Public product – may be moved up in product when appropriate for understandability):

AT 140 PM ALASKAN DAYLIGHT TIME ON JULY 27 AN EARTHQUAKE WITH PRELIMINARY MAGNITUDE 7.9 OCCURRED 90 MILES/145 KM NORTHWEST OF ADAK ALASKA.

A MAGNITUDE 7.2 EARTHQUAKE OCCURRED AT 1121AM HAWAIIAN STANDARD TIME OFF THE KONA COAST OF THE BIG ISLAND. THIS EARTHQUAKE HAS THE POTENTIAL TO HAVE GENERATED A DESTRUCTIVE TSUNAMI.

A MAGNITUDE 8.2 EARTHQUAKE OCCURRED AT 315PM HAWAIIAN STANDARD TIME IN THE KURIL ISLANDS. A TSUNAMI WAS GENERATED BY THIS EARTHQUAKE WITH THE POTENTIAL TO BE A HAZARD IN THE STATE OF HAWAII.

Examples (Standard international product):

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1415 UTC 02 JUN 2008
0515 HST 02 JUN 2008
COORDINATES - 38.5 NORTH 143.1 EAST
DEPTH - 33 KM/21 MILES
LOCATION - OFF EAST COAST OF HONSHU JAPAN
MAGNITUDE - 8.1

Segmentation: For WC/ATWC segmented products.

Examples:

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-272217-
/T.CON.PAAQ.TS.W.0014.000000T0000Z-000000T0000Z/
COASTAL AREAS FROM DUCK NC TO CAPE CHIDLEY LABRADOR.
517 PM AST TUE JUL 27 2010

...THE TEST TSUNAMI WARNING CONTINUES IN EFFECT FOR THE NORTH
CAROLINA/ VIRGINIA/ DELAWARE/ NEW JERSEY/ MARYLAND/
CONNECTICUT/ RHODE ISLAND/ NEW YORK/ MASSACHUSETTS/ NEW
HANPSHIRE/ MAINE/ NEW BRUNSWICK/ NOVA SCOTIA/
NEWFOUNDLAND AND LABRADOR COASTS FROM DUCK NC TO CAPE CHIDLEY
LABRADOR...

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

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

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

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2.5.2 VTEC Usage in Tsunami Products

VTEC (see NWSI 10-1703) are given in the products indicated in Table 1. The VTEC elements provided in tsunami products are:

Fixed Identifier

- O – Used in normal warning/advisory/watch product delivery
- T – Used for communication tests and example messages for exercises

Action

- NEW – used the first time a warning, advisory, or watch is issued for an event,
- CON – used when a warning, advisory, or watch is continued for the same region,
- EXA – used when a warning, advisory, or watch is expanded to include other zones, and
- CAN – used when a warning, advisory, or watch is cancelled.

Office ID

- PAAQ – West Coast/Alaska Tsunami Warning Center
- PHEB – Pacific Tsunami Warning Center

Phenomena

TS – Tsunami

Significance

W – Warning

Y – Advisory

A – Watch

Event Tracking Number (ETN)

The ETN resets to 1 on January 1st of each year at 00:00 UTC. Each tsunami event constitutes one ETN. For example, an earthquake in Chile which triggers warnings, watches, and advisories for different regions of the AORs has the same ETN over the entire event for each message product from each TWC. The ETN for one event may not be the same between different TWCs, or different message products within a TWC. Communication tests and live exercises also constitute one ETN. The ETN increments to the next integer after each event, communication test, or live exercise.

Event Beginning Date/Time

Beginning times are provided for “NEW” events only. The beginning times are the message issue time. Continuations (CON), expansions (EXA), and cancellations (CAN) have zeroes for the time and date. Communication tests and live exercises also provide a beginning time which is the message issue time.

Event Ending Date/Time

Ending times are set to zeroes for all issued products as all warning, watches, and advisories are canceled (CAN) with a cancellation message. Communication tests and live exercises contain an ending time which is normally in the range of 20-60 minutes after the beginning time.

PTWC Examples

A series of UGC and VTEC lines created at PTWC WEHW40 products for Hawaii. The example shown is a large distant earthquake for which the entire State of Hawaii is initially put into a watch, is then upgraded to a warning, and then after wave passage has the warning cancelled.

Bulletin 1: Initial Watch

HIZ001>003-005>009-012>014-016>021-023>026-241905-
/O.NEW.PHEB.TS.A.0013.100324T1705Z-000000T0000Z/

Bulletin 2: Upgrade Watch to Warning

HIZ001>003-005>009-012>014-016>021-023>026-242005-
/O.CAN.PHEB.TS.A.0013.000000T0000Z-000000T0000Z/
/O.NEW.PHEB.TS.W.0012.100324T1805Z-000000T0000Z/

Bulletin 3: Continue Warning

HIZ001>003-005>009-012>014-016>021-023>026-242105-

/O.CON.PHEB.TS.W.0012.000000T0000Z-000000T0000Z/

Bulletin 10: Cancel Warning

HIZ001>003-005>009-012>014-016>021-023>026-250405-
/O.CAN.PHEB.TS.W.0012.000000T0000Z-000000T0000Z/

WC/ATWC Examples

A series of examples is shown below which provide VTEC for two zones which are placed in a watch, upgraded to a warning, downgraded to an advisory, expanded to another zone, and then canceled.

Bulletin 1: Initial Watch

AKZ187-191-260202-
/O.NEW.PAAQ.TS.A.0013.100726T0102Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING NIKOLSKI ALASKA TO ATTU ALASKA

Bulletin 2: Upgrade Watch to Warning

AKZ187-191-260302-
/O.CAN.PAAQ.TS.A.0013.000000T0000Z-000000T0000Z/
/O.NEW.PAAQ.TS.W.0013.100726T0202Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING NIKOLSKI ALASKA TO ATTU ALASKA

Bulletin 3: Continue Warning

AKZ187-191-260402-
/O.CON.PAAQ.TS.W.0013.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING NIKOLSKI ALASKA TO ATTU ALASKA

Bulletin 4: Downgrade Warning to Advisory

AKZ187-191-260502-
/O.CAN.PAAQ.TS.W.0013.000000T0000Z-000000T0000Z/
/O.NEW.PAAQ.TS.Y.0013.100726T0402Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING NIKOLSKI ALASKA TO ATTU ALASKA

Bulletin 5: Continue Advisory

AKZ187-191-260602-
/O.CON.PAAQ.TS.Y.0013.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING NIKOLSKI ALASKA TO ATTU ALASKA

Bulletin 6: Expand Advisory Region

AKZ185-260702-
/O.EXA.PAAQ.TS.Y.0013.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING UNIMAK PASS ALASKA/80
MILES NE OF DUTCH HARBOR/ TO NIKOLSKI ALASKA

AKZ187-191-260702-
/O.CON.PAAQ.TS.Y.0013.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING NIKOLSKI ALASKA TO ATTU ALASKA

Bulletin 7: Continue Advisory in Expanded Region

AKZ185-187-191-260802-

/O.CON.PAAQ.TS.Y.0013.000000T0000Z-000000T0000Z/

COASTAL AREAS BETWEEN AND INCLUDING UNIMAK PASS ALASKA/80
MILES NE OF DUTCH HARBOR/ TO ATTU ALASKA

Bulletin 8: Cancel Advisory in Expanded Region

AKZ185-187-191-260324-

/O.CAN.PAAQ.TS.Y.0013.000000T0000Z-000000T0000Z/

COASTAL AREAS BETWEEN AND INCLUDING UNIMAK PASS ALASKA/80
MILES NE OF DUTCH HARBOR/ TO ATTU ALASKA

2.5.3 Graphical Tsunami Products

The following are TWC graphical, internet-based products which may be produced and displayed at the following sites:

tsunami.gov

wcatwc.arh.noaa.gov

www.weather.gov/ptwc

All graphical products posted to these sites will have the official NOAA logo placed in the bottom right hand corner of the graphic. Graphical products will also include a brief description of the graphic.

Product

Epicentral zone maps with appropriate geophysical overlays

Tsunami travel time map

Warning/watch area map

Tsunami energy distribution map

Site-specific inundation map

Observed and forecast tsunami time series plots

The following are NWS internet-based products which may be produced by the TWCs:

Product

Web-based tsunami arrival time, amplitude forecast, and observation table

Digital cell phone text message (Short Messaging Service - SMS)

CAP/XML format message

Tsunami products formatted for web viewing

Really Simple Syndication (RSS) feeds for tsunami products

2.6 Communication Tests

Tsunami communications tests verify communication pathways between the TWCs and primary recipients, and the timeliness of message delivery over those pathways. Each TWC will conduct periodic tests; at least quarterly. Primary recipients include: designated national focal points, state/territorial warning points, coastal Weather Forecast Offices (WFOs), U.S. Coast Guard, and critical military dissemination points. TWCs will document the results of each test.

2.7 Dissemination

Message dissemination routes used by the TWCs are summarized in Table 3. Primary routes are the National Warning System (NAWAS), the NOAA Weather Wire System (NWWS), NOAAnet and/or private circuits to the NWS Telecommunications Gateway, and the Federal Aviation Administration’s (FAA) National Airspace Data Interchange Network (NADIN2) and the Aeronautical Fixed Telecommunications Network (AFTN) communication systems. Both TWCs feed messages into AWIPS: WC/ATWC through the Alaska Regional Headquarters and PTWC through the NWS Telecommunications Gateway. The NWS Telecommunications Gateway is the conduit to WMO’s Global Telecommunications System (GTS) which is used as the primary pathway to primary international users. Secondary routes are FAX, email, web sites, RSS feeds, cell phone text messaging, CAP/XML feeds, United States Geological Survey (USGS) dissemination systems including the NEIC website and the California Integrated Seismic Network (CISN) earthquake display, and telephone calls.

Service	Communication Link	User Audience	PTWC	WC/ATWC
AWIPS	Advanced Weather Interactive Processing System	U.S. Weather Forecast Offices and NOAAPort Users	X	X
NWWS	NOAA Weather Wire System	State/Territory/Canadian warning points, US Coast Guard	X	X
NAWAS	National Warning System circuit	State/Territory warning points, U.S. Coast Guard, Federal Emergency Management Agency, US Coast Guard.	X	X
HAWAS	Hawaii NAWAS circuit	State of Hawaii Emergency Response Offices	X	
AKWAS	Alaska NAWAS circuit	State of Alaska Emergency Response Offices		X
IDN	Inter-island Data Network circuit	State of Hawaii Civil Defense Offices	X	

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NOAAnet	NOAA network dedicated circuit with VSAT backup	NWS Telecommunications Gateway	X	X
NWS Line223	Private NWS circuit	NWS Telecommunications Gateway, NWS Alaska Region Offices		X
Private ISP	Private ISP	NWS Telecommunications Gateway	X	X
NADIN2 and AFTN	FAA National Airspace Data Interchange Network and Aeronautical Fixed Telecommunications Circuit	FAA Offices, NWS Offices, Foreign National Tsunami Warning Focal Points.	X	X
GTS	Global Telecommunications System through NWS Telecommunications Gateway	Foreign National Tsunami Warning Focal Points	X	X
EMWIN	Emergency Manager's Weather Information Network through NWS Telecommunication Gateway	National/State/Local Emergency Management Agencies, Foreign National Tsunami Warning Focal Points	X	X
FAX	TeleFAX through Email system	National/State/Local Warning Points, U.S. Coast Guard, Foreign National Tsunami Warning Focal Points	X	X
Email	Public and Private lists	All primary contacts and the general public, Foreign National Tsunami Warning Focal Points	X	X
RANET SMS	Digital cell phone text messaging	Foreign National Tsunami Warning Focal Points	X	
SMS	Digital cell phone text messaging	All primary contacts and the general public	X	X
Web	TWC web sites	All primary contacts and the general public	X	X
RSS	Really Simple Syndication	All primary contacts and the general public	X	X
CAP/XML	Common Alerting Protocol issued through web sites	All primary contacts and the general public		X

EIDS and CISN	USGS Earthquake Information Dissemination System	National/State/Local Warning Points, Foreign National Tsunami Warning Focal Points	X	X
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Table 3. TWC product dissemination paths.

3. Product Criteria

3.1 Specific Regionalization of Procedural Regions and AORs

Criteria used by TWCs to determine which product to issue are organized by geographic regions as defined in Table 4 and the Figures 3 through 5.

Region	WC/ATWC AOR	PTWC AOR
U.S. West Coast	X	
British Columbia	X	
Alaska/Aleutian Islands	X	
Bering Sea – Shallow water	X	
Bering Sea – Deep Water	X	
Pacific Basin and all its marginal seas except the Bering Sea		X
Pacific Basin, Philippine Sea, South China Sea, Sulu Sea, Celebes Sea, Bismarck Sea, Solomon Sea, Coral Sea and Tasman Sea.		X
Sea of Okhotsk, Sea of Japan/East Sea, East China Sea, Molucca Sea, Banda Sea and Arafura Sea		X
Hawaii		X
Alaska/Canada Arctic coast	X	
Arctic Ocean		
U.S. East Coast	X	
U.S. Gulf of Mexico Coast	X	
Eastern Canada	X	
Gulf of St. Lawrence	X	
Puerto Rico/Virgin Islands	X	
Caribbean Sea		X
Mid-Atlantic Ridge		
Atlantic Basin		
Indian Ocean		X

Table 4. TWC procedural regions

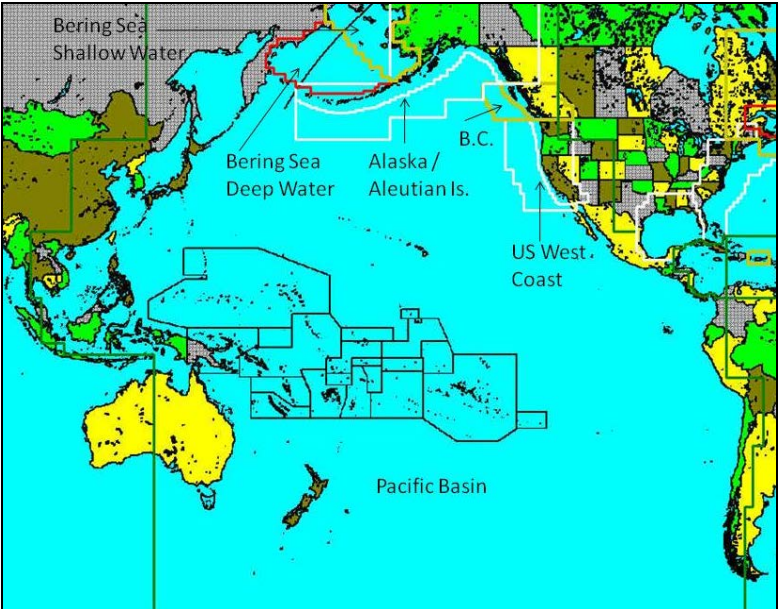


Figure 3. Pacific regions. Note that the line offshore of the US West Coast, Canada, and Alaska indicates the delineation from near shore to far offshore for warning issuance criteria purposes.

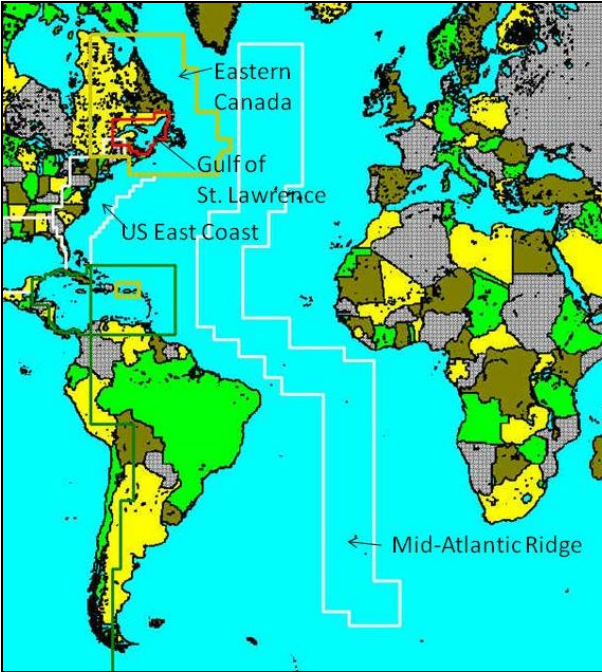


Figure 4. Atlantic Regions.



Figure 5. Caribbean and southeast USA regions.

3.2 Criteria for Initial Messages

Criteria which define the initial product type to be issued by the TWCs are defined in Table 5. Product examples are provided in Appendix A. Note that at WC/ATWC, a pre-defined threat database is checked for warning/watch/advisory regions. If the source region, magnitude, and depth are defined in the database, the warning, watch, and advisory region are taken from the database. (For example, if a shallow magnitude 7.3 earthquake occurs within the Puget Sound, only the Puget Sound NWS public zones are placed in a tsunami warning. In special cases like this, the normal breakpoints provided in an earlier section may not be used to define the alert zone.) Note also that PTWC issues two messages for most Pacific events, an international message and a Hawaii-specific message. In Table 5, the PTWC international message is shown on top and the Hawaii message below.

In situations where the earthquake epicenter is onshore and a tsunami warning, watch, or advisory is required, TWCs may elect to issue a Tsunami Information Statement if the onshore distance is too great for the earthquake to generate a tsunami.

Given the ocean-wide impact of some tsunamis, and that the two TWCs may be responsible for different aspects of the same event, timely coordination between the TWCs is essential for the overall effectiveness of tsunami services. To ensure the fastest possible response, the initial message may be issued by the TWCs without coordination when both AORs may be affected by the event within an hour of earthquake origin time, or when the event can be felt in both AORs. Parameters determined by the first TWC to issue a product will be utilized by the other TWC to issue its message to ensure consistent information dissemination. Supplemental messages will be fully coordinated between the TWCs concerning earthquake parameters, tsunami observations, and other TWC actions.

Table 5. TWC response criteria for initial product based on earthquake location, magnitude, and depth.

Earthquake Region	Earthquake Magnitude	Earthquake Depth (km)	PTWC Product Type	PTWC AWIPS Code	PTWC Warning, Watch, Advisory Area	WC/ATWC Product Type	WC/ATWC AWIPS Code	WC/ATWC Warning, Watch, Advisory Area
U.S. West Coast, British Columbia	$4 \leq M \leq 6.4$	any	N/A	N/A	N/A	Tsunami Information Statement	EQIWOC	N/A
Alaska/Aleutian Islands, Bering Sea Shallow and Deep Water, Alaska/Canada Arctic coast	$4 \leq M \leq 6.4$	any	N/A	N/A	N/A	Tsunami Information Statement	EQIAKX	N/A
U.S. West Coast, British Columbia, Alaska/Aleutian Islands, Bering Sea Shallow and Deep Water, Alaska/Canada Arctic coast	$6.5 \leq M \leq 7.0$	any	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Information Statement	TIBWCA	N/A
	or $6.5 \leq M \leq 7.8$	or ≥ 100	<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX				
U.S. West Coast, British Columbia, Alaska/Aleutian Islands, - near shore	$7.1 \leq M \leq 7.5$	< 100	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Warning	TSUWCA	250km radius from epicenter

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			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX				
U.S. West Coast, British Columbia, Alaska/Aleutian Islands, - far offshore (as defined in TWC Operations Manual)	$7.1 \leq M \leq 7.5$	< 100	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Advisory	TSUWCA	250km radius from epicenter
			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX				
U.S. West Coast, British Columbia, Alaska/Aleutian Islands	$7.6 \leq M \leq 7.8$	< 100	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Warning	TSUWCA	500km radius from epicenter
			or	or	or			
			if AOR is within 1000km*	if AOR is within 1000km*	if AOR is within 1000km*			Tsunami Warning
			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX	N/A	Tsunami Advisory		500km to 1000km radius from epicenter

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U.S. West Coast, British Columbia, Alaska/Aleutian Islands	$M \geq 7.9$	< 100	<u>Pacific:</u> Tsunami Warning	<u>Pacific:</u> TSUPAC	Coasts < 3 hrs to first wave*	Tsunami Warning	TSUWCA	Coasts within three hours travel time
			<u>Pacific:</u> Tsunami Watch	<u>Pacific:</u> TSUPAC	Coasts 3-6 hrs to first wave*			Coasts within three hours travel time
			<u>Hawaii:</u> Tsunami Watch	<u>Hawaii:</u> TSUHWX	Entire State of Hawaii	Tsunami Watch		All other WC/ATWC Pacific AOR coastal regions
U.S. West Coast, British Columbia, Alaska/Aleutian Islands	$M \geq 7.9$	≥ 100	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Warning	TSUWCA	Coasts within three hours travel time
			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX		Tsunami Watch		All other WC/ATWC Pacific AOR coastal regions
Bering Sea – Deep Water	$M \geq 7.1$	< 100	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Warning	TSUWCA	Pribilof and Aleutian Islands from Unimak Pass to Attu
	or $M \geq 7.9$	or any	<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX				
Bering Sea – Shallow Water	$M \geq 7.1$	< 100	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Advisory	TSUWCA	Western Alaska coast
	or $M \geq 7.9$	or any	<u>Hawaii:</u>	<u>Hawaii:</u>				

			Tsunami Information Statement	TIBHWX				
Alaska/Canada Arctic coast	$M \geq 7.1$ or $M \geq 7.9$	< 100 or any	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Advisory	TSUWCA	Northern Alaska coast
			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX				
Arctic Ocean	$M \geq 6.5$	any	N/A/	N/A	N/A	Tsunami Information Statement	TIBWCA	N/A
Pacific Basin and all its marginal seas except the Bering Sea	$6.5 \leq M \leq 7.5$ or $M \geq 7.6$	any or ≥ 100	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Information Bulletin	TIBWCA	N/A
			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX				
Pacific Basin, Philippine Sea, South China Sea, Sulu Sea, Celebes Sea, Bismarck Sea, Solomon Sea, Coral Sea and Tasman Sea.	$7.6 \leq M \leq 7.8$	<100	<u>Pacific:</u> Tsunami Warning	<u>Pacific:</u> TSUPAC	Coasts < 1000km*	Tsunami Information Bulletin or if source within 1000km of	TIBWCA	N/A
			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX	N/A			

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						AOR Tsunami Advisory	TSUWCA	Coasts within 1000km
Pacific Basin, Philippine Sea, South China Sea, Sulu Sea, Celebes Sea, Bismarck Sea, Solomon Sea, Coral Sea and Tasman Sea.	$M \geq 7.9$	<100	<u>Pacific:</u> Tsunami Warning	<u>Pacific:</u> TSUPAC	Coasts < 3 hrs to first wave*	Tsunami Information Bulletin	TIBWCA	N/A
			<u>Pacific:</u> Tsunami Watch	<u>Pacific:</u> TSUPAC	Coasts 3-6 hrs to first wave*			
			<u>Hawaii:</u> Tsunami Watch or if source south of 35°N and initial wave > 6 hours travel time from Hawaii	<u>Hawaii:</u> TSUHWX	All Hawaii	OR if source within 6 hour travel time of AOR	Tsunami Warning	TSUWCA
			Tsunami Information Statement	TIBHWX	N/A	Tsunami Watch	TSUWCA	All other WC/ATWC Pacific AOR coastal regions
Sea of Okhotsk, Sea of Japan/East Sea, East China Sea, Molucca Sea, Banda	$M \geq 6.5$	any	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A			

Sea and Arafura Sea			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX	N/A			
Hawaii	$4.0 \leq M \leq 6.4$	any	<u>Pacific:</u> N/A	<u>Pacific:</u> N/A	N/A	N/A	N/A	N/A
			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> EQIHWX				
Hawaii	$6.5 \leq M \leq 6.8$ or $M \geq 6.9$	any or ≥ 100	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Information Statement	TIBWCA	N/A
			<u>Hawaii:</u> Tsunami Information Statement	<u>Hawaii:</u> TIBHWX				
Hawaii	$6.9 \leq M \leq 7.5$	<100	<u>Pacific:</u> Tsunami Information Bulletin	<u>Pacific:</u> TIBPAC	N/A	Tsunami Information Statement	TIBWCA	N/A
			<u>Hawaii:</u> Tsunami Warning	<u>Hawaii:</u> TSUHWX				
Hawaii	$7.6 \leq M \leq 7.8$	<100	<u>Pacific:</u> Tsunami	<u>Pacific:</u> TSUPAC	Coasts < 1000km*	Tsunami Information	TIBWCA	N/A

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			Warning			Statement		
			<u>Hawaii:</u> Tsunami Warning	<u>Hawaii:</u> TSUHWX	Entire State of Hawaii			
Hawaii	$M \geq 7.9$	<100	<u>Pacific:</u> Tsunami Warning	<u>Pacific:</u> TSUPAC	Coasts < 3 hrs to first wave*	Tsunami Information Statement	TIBWCA	N/A
			<u>Pacific:</u> Tsunami Watch	<u>Pacific:</u> TSUPAC	Coasts 3-6 hrs to first wave*			
			<u>Hawaii:</u> Tsunami Warning	<u>Hawaii:</u> TSUHWX	Entire State of Hawaii			
Indian Ocean	$6.5 \leq M \leq 7.0$ or $M \geq 7.1$	any or ≥ 100	Tsunami Information Bulletin	TIBIOX	N/A	N/A	N/A	N/A
Indian Ocean	$7.1 \leq M \leq 7.5$	<100	Tsunami Watch	TSUIOX	Coasts < 200km*	Tsunami Information Statement	TIBWCA	N/A
Indian Ocean	$7.6 \leq M \leq 7.8$	<100	Tsunami Watch	TSUIOX	Coasts < 1000km*	Tsunami Information Statement	TIBWCA	N/A
Indian Ocean	$M \geq 7.9$	<100	Tsunami Watch	TSUIOX	All Indian Ocean Coasts	Tsunami Information Statement	TIBWCA	N/A
U.S. East Coast, U.S Gulf of Mexico,	$4.0 \leq M \leq 5.9$	any	N/A	N/A	N/A	Tsunami Information	EQIAT1	N/A

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Eastern Canada, Gulf of St. Lawrence						Statement		
U.S. Gulf of Mexico	$6.0 \leq M \leq 6.4$	any	Tsunami Information Statement	TIBCAX	N/A	Tsunami Information Statement	TIBAT1	N/A
U.S. East Coast, Eastern Canada, Gulf of St. Lawrence	$6.0 \leq M \leq 6.4$	any	N/A	N/A	N/A	Tsunami Information Statement	TIBAT1	N/A
U.S. East Coast, U.S. Gulf of Mexico, Eastern Canada, Gulf of St. Lawrence	$6.5 \leq M \leq 7.8$	≥ 100	Tsunami Information Statement	TIBCAX	N/A	Tsunami Information Statement	TIBAT1	N/A
U.S. East Coast, U.S. Gulf of Mexico, Eastern Canada, Gulf of St. Lawrence	$6.5 \leq M \leq 7.5$	<100	Tsunami Information Statement	TIBCAX	N/A	Tsunami Warning	TSUAT1	250km radius from epicenter
U.S. East Coast, U.S. Gulf of Mexico, Eastern Canada, Gulf of St. Lawrence	$7.6 \leq M \leq 7.8$	<100	Tsunami Information Statement	TIBCAX	N/A	Tsunami Warning	TSUAT1	500km radius from epicenter
						Tsunami Advisory		500km to 1000km radius from epicenter
U.S. East Coast, U.S. Gulf of Mexico, Eastern Canada, Gulf of St. Lawrence	$M \geq 7.9$	≥ 100	Tsunami Information Statement	TIBCAX	N/A	Tsunami Warning	TSUAT1	1000km radius from epicenter
U.S. East Coast, U.S. Gulf of Mexico, Eastern Canada, Gulf of St. Lawrence	$M \geq 7.9$	<100	Tsunami Watch	TSUCAX	All Caribbean Sea coasts	Tsunami Warning	TSUAT1	1000km radius from epicenter

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of St. Lawrence								
Puerto Rico/Virgin Islands	$4.0 \leq M \leq 5.9$	any	N/A	N/A	N/A	Tsunami Information Statement	EQIAT1	N/A
Puerto Rico/Virgin Islands	$6.0 \leq M \leq 6.4$ or $6.5 \leq M \leq 7.8$	any or ≥ 100	Tsunami Information Statement	TIBCAX	N/A	Tsunami Information Statement	TIBAT1	N/A
Puerto Rico/Virgin Islands	$6.5 \leq M \leq 7.0$	<100	Tsunami Information Statement	TIBCAX	N/A	Tsunami Warning	TSUAT1	Puerto Rico/Virgin Islands
Puerto Rico/Virgin Islands	$7.1 \leq M \leq 7.5$	<100	Tsunami Watch	TSUCAX	Coasts < 200km*	Tsunami Warning	TSUAT1	Puerto Rico/Virgin Islands
Puerto Rico/Virgin Islands	$7.6 \leq M \leq 7.8$	<100	Tsunami Watch	TSUCAX	Coasts < 1000km*	Tsunami Warning	TSUAT1	Puerto Rico/Virgin Islands
Puerto Rico/Virgin Islands	$M \geq 7.9$	≥ 100	Tsunami Information Statement	TIBCAX	N/A	Tsunami Warning	TSUAT1	Puerto Rico/Virgin Islands
Puerto Rico/Virgin Islands	$M \geq 7.9$	<100	Tsunami Watch	TSUCAX	All Caribbean Sea coasts	Tsunami Warning	TSUAT1	Puerto Rico/Virgin Islands
Caribbean Sea	$6.0 \leq M \leq 7.0$ or $M \geq 7.1$	any or ≥ 100	Tsunami Information Bulletin	TIBCAX	N/A	Tsunami Information Statement	TIBAT1	N/A
Caribbean Sea	$7.1 \leq M \leq 7.5$	<100	Tsunami Watch	TSUCAX	Coasts < 200km*	Tsunami Information Statement	TIBAT1	N/A
Caribbean Sea - east	$7.6 \leq M \leq 7.8$	<100	Tsunami	TSUCAX	Coasts	Tsunami	TSUAT1	Puerto Rico/

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of 75W			Watch		< 1000km*	Advisory		Virgin Islands
Caribbean Sea – west of 75W	$7.6 \leq M \leq 7.8$	<100	Tsunami Watch	TSUCAX	Coasts < 1000km*	Tsunami Information Statement	TIBAT1	N/A
Caribbean Sea – east of 75W	$M \geq 7.9$	<100	Tsunami Watch	TSUCAX	All Caribbean: Sea coasts	Tsunami Warning	TSUAT1	Puerto Rico/ Virgin Islands
Caribbean Sea – west of 75W	$M \geq 7.9$	<100	Tsunami Watch	TSUCAX	All Caribbean Sea coasts	Tsunami Advisory	TSUAT1	Puerto Rico/ Virgin Islands
Atlantic Basin	$6.5 < M \leq 7.8$ or $M \geq 7.9$	any or ≥ 100	Tsunami Information Statement	TIBCAX	N/A	Tsunami Information Statement	TIBAT1	N/A
Atlantic Basin	$M \geq 7.9$	<100	Tsunami Watch	TSUCAX	All Caribbean Sea coasts	Tsunami Information Statement	TIBAT1	N/A

*in all cases where the level of alert is determined by the distance to the source or by the time remaining until first wave arrival it is measured relative to any point within the set of coastal forecast points assigned to each geographical entity named at that alert level.

3.3 Supplemental Messages

In cases where a significant tsunami has been observed following an information statement or bulletin, or when a tsunami warning, advisory, or watch has been issued, supplemental messages are required. Decisions regarding supplemental messages to initiate, continue, upgrade, downgrade, or cancel, are based upon all available seismic and sea level data, any reliable tsunami observations, and the output of numerical tsunami forecast models. Each of these information sources is evaluated in the context of the historical tsunami data, knowledge of the general behavior of tsunamis and the hazard they pose, and in consideration of the consistency of all available information. Tsunami impact forecasts such as coastal amplitude and expected inundation or current levels are not issued until the forecast is calibrated or verified with at least one sea level gage.

In the WC/ATWC AOR and the PTWC domestic AORs, where both warnings and advisories indicate threat level, warnings are issued for regions where the forecast or observed tsunami amplitude (elevation of the wave above ambient sea level) is over 1 meter. Advisories are issued for regions where the maximum forecast amplitude is between 0.3m and 1.0m or the observed amplitude is between 0.5 and 1 meter. The difference between the forecast and observed level for advisories is based on forecast accuracy and a safety factor. Since tsunami impact can be variable throughout a region, watchstander judgment is used when forecasts range over different threat levels within a region. Warnings, advisories, and watches will be cancelled when the expected or observed amplitude is below 0.3 meters and the trend is diminishing in most places being monitored in the area being cancelled.

In the PTWC international AOR where only warnings indicate the threat level in the Pacific Ocean region and only watches indicate the threat level in the Indian Ocean and Caribbean Sea regions, these alerts are issued by predetermined procedures based on the earthquake magnitude or where the expected or observed tsunami amplitude is over 0.5 meter. They will be cancelled when the expected or observed amplitude is below 0.3 meter and the trend is diminishing in most places being monitored in the area being cancelled.

Given the broad geographic extent of TWC messages and the variability of tsunami amplitude along the coast, warning and advisory areas may have to be grouped so that warning and/or advisory regions do not fluctuate rapidly along coasts. Further, due to the changes in the forecast as it is constrained by additional incoming data, the alert levels for each region may have to be altered so they do not fluctuate rapidly in time.

Warning, advisory, and watch messages will indicate the time interval when the next message will be issued. For domestic products (WEPA41 PAAQ, WEAK51 PAAQ, WEXX20 PAAQ, WEXX30 PAAQ, WEHW50 PHEB, and WEHW40 PHEB), this will normally be 30 minutes when the source is within the AOR and 60 minutes when the source is outside the AOR. For international products (WEPA40 PHEB, WEIO21 PHEB, and WECA41 PHEB), this will normally be 60 minutes. In events where a significant tsunami is generated and TWC products

will be issued over a period of more than several hours and the time intervals between messages may be increased up to 120 minutes after the fourth message.

Cancellations are issued whenever a warning, watch, or advisory is ended (as opposed to an upgrade or downgrade). The cancellation provides a summary of known tsunami impacts and observations, as well as an evaluation which provides an indication of any potential future tsunami impacts.

3.4 Coordination with Primary Domestic Users

In addition to products issued via standard methods, TWCs conduct enhanced coordination efforts with primary domestic users (NWS WFOs and WSOs, state/territory emergency management officials, the U.S. Coast Guard, the U.S. Navy, and, when possible, foreign tsunami contacts). The intent of these enhanced communications is to deliver information not provided in the standard messages such as extra arrival times, forecast amplitudes and inundation potential, coastal areas of special concern, and other value-added information. These communications can take the form of teleconferences, individual phone calls, and/or conferences over dedicated circuitry. During the initial stages of the event, the TWCs may not know any other information than that contained in the messages. By the third message, or when a reasonable forecast has been obtained based on observations of the tsunami (if sooner), enhanced coordination efforts should be performed. Following initial coordination, updates should be provided periodically every hour. TWCs will provide at least 15 minutes notice to participants before a coordination conference call via, e-mail, or other previously coordinated methods.

3.5 Experimental Products

The implementation of a TWC experimental product or service or making a substantial change to an existing operational product or service follows NWS Instruction 10-102 New or Enhanced Products or Services. Experimental products, such as model guidance, are only issued by the TWCs during a tsunami event when the experimental product has an approved Product Description Document (PDD) and Service Description Document (SDD) in accordance with NWSI 10-102.

Once the experimental product's PDD/SDD is approved, the TWCs will begin distributing the product/service with the primary purpose of receiving partner/user feedback. The product's labels will clearly identify it as experimental (e.g., Experimental Tsunami Forecast Model). If the product/service is available via the internet, the Uniform Resource Locator (URL) of the page will be included in the PDD/SDD. A locally-generated or national Public Information Statement (PNS) will be issued before distribution of any experimental product/service. The PNS will include a brief description of the product/service, Web address, evaluation period, and a point of contact.

4. NWS Weather Forecast Offices Support and Responsibilities

NWS WFOs, and in some cases Weather Service Offices (WSOs), disseminate tsunami warnings, advisories, watches, and/or information statements from the TWCs in conjunction with

actions taken by state, territory, and local emergency management agencies and in accordance with their Regional Supplemental Instructions. WFOs and certain WSOs are responsible for issuing tsunami messages over NOAA Weather Radio All Hazards (NWR) and are responsible for the activation of EAS in accordance with individual state EAS plans. Emergency management agencies have the ultimate responsibility for calling for evacuations for threatened populations. The WFOs and WSOs serve an important link in disseminating tsunami information and in working with emergency management agencies prior to, during, and after an event.

NWS Regions with WFOs or WSOs involved in the TWS (Eastern, Southern, Western, Alaska, and Pacific) may create a regional supplement with specific instructions for WFO or WSO actions regarding tsunami information dissemination. WFOs and WSOs are responsible for creating and maintaining specific instructions relating to tsunami information dissemination within their Station Duty Manuals.

In addition to forwarding tsunami information over NWR and EAS, WFOs and WSOs may issue Special Weather Statements (SPS) to supplement information contained in TWC tsunami messages. These SPSs follow a specified format as provided in regional supplements to ensure consistency between WFOs and WSOs in a Region.

WFOs and WSOs provide tsunami outreach and educational services to users and the general public within their County Warning Area (CWA). The TWCs will support these efforts as time and budget allow. WFOs and WSOs will oversee the TsunamiReady program within their CWA (reference NWSI 10-1802 on the TsunamiReady program).

5. Seismic Information Exchange and Dissemination

The National Earthquake Information Center (NEIC), located in Golden, Colorado, has the responsibility for disseminating information on earthquakes occurring worldwide. The NWS tsunami program generally will not disseminate or directly answer inquiries for seismic information, except in response to tsunamigenic and potentially tsunamigenic earthquakes and in cases where informative messages are necessary to prevent unneeded evacuations (i.e., strongly felt earthquakes in coastal areas).

Separate from the exchange of information between Centers and with the NEIC, the WC/ATWC and PTWC will adhere to the following policy on the dissemination of seismic information:

- a. For tsunamigenic or potentially tsunamigenic earthquakes, no restrictions exist on the exchange of earthquake parameters with any observatory.
- b. For non-tsunamigenic earthquakes with epicenters located outside the Center's domestic TSR, inquiries from the news media will be referred to the NEIC.

c. For non-tsunamigenic earthquakes with epicenters located within the Center's domestic TSR (usually magnitude 4.0 or greater or those with felt reports), any Tsunami Information Statements or Tsunami Seismic Information Statements disseminated will be transmitted to the NEIC.

d. For non-tsunamigenic earthquakes, all requests from foreign agencies for earthquake parameters will be referred to the NEIC.

6. User Guides

User Guides serve as key reference manuals for participants of the TWS within a specific region. They provide a general overview of the nature of tsunamis and a brief history of the warning service, and may list the sea level and seismometer stations which transmit data to the TWCs responsible for the region. The Guides also provide examples of TWC tsunami products, list product dissemination routes, and provide a summary of the criteria used to issue alerts.

Links to User Guides, their respective regions, and the agency(ies) responsible for maintaining the document are listed in Table 6.

Link to User Guide	Region	Responsible Agency
http://wcatwc.arh.noaa.gov/ops/opsmanual.pdf	WC/ATWC AOR	WC/ATWC
http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=1303&Itemid=1303&lang=en	Pacific Ocean and marginal seas	PTWC, JMA, WC/ATWC, ITIC, IOC
http://www.ioc-tsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=6747&lang=en	Indian Ocean	PTWC, JMA, IOC
http://www.ioc-tsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=6354&lang=en	Caribbean Sea and adjacent regions outside of WC/ATWC AOR	PTWC, IOC

Table 6. TWC User Guides.

APPENDIX A - Examples of Tsunami Warning Center Products

1. WC/ATWC Products

1.1 Pacific AOR Tsunami Warning/Watch/Advisory (WEPA41 PAAQ)

WEPA41 PAAQ 272039
TSUWCA

BULLETIN
TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
139 PM PDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEPA41 MESSAGE...

...A TEST TSUNAMI WARNING IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF CALIFORNIA AND OREGON FROM RAGGED POINT
CALIFORNIA/45 MILES NW OF SAN LUIS OBISPO/ TO CASCADE HEAD
OREGON/70 MILES SW OF PORTLAND/...

...A TEST TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO
BORDER TO RAGGED POINT CALIFORNIA/45 MILES NW OF SAN LUIS
OBISPO/...

...A TEST TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF OREGON - WASHINGTON AND BRITISH COLUMBIA
FROM CASCADE HEAD OREGON/70 MILES SW OF PORTLAND/ TO THE
NORTH TIP OF VANCOUVER ISLAND BRITISH COLUMBIA...

...THIS MESSAGE IS INFORMATION ONLY FOR COASTAL AREAS OF
BRITISH COLUMBIA AND ALASKA FROM THE NORTH TIP OF VANCOUVER
ISLAND BRITISH COLUMBIA TO ATTU ALASKA...

RECOMMENDED ACTIONS

- PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO
INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS
ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.
- PERSONS IN TSUNAMI WARNING COASTAL AREAS SHOULD MOVE INLAND TO
HIGHER GROUND.
 - PERSONS IN TSUNAMI ADVISORY AREAS SHOULD MOVE OUT OF THE
WATER... OFF THE BEACH AND OUT OF HARBORS AND MARINAS.

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

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

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CONTINUE FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

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

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

&&

MEASUREMENTS AND/OR FORECASTS OF TSUNAMI ACTIVITY

SITE	LAT	LON	ARRIVAL TIME	FCST AMP	OBS AMP

CALIFORNIA					
CRESCENT CITY	41.7N	124.2W	1307PDT JUL 27		
SAN FRANCISCO	37.8N	122.5W	1345PDT JUL 27		
SANTA BARBARA	34.4N	119.7W	1443PDT JUL 27		
SAN PEDRO	33.7N	118.3W	1459PDT JUL 27		
LA JOLLA	32.9N	117.3W	1513PDT JUL 27		
OREGON					
CHARLESTON	43.3N	124.3W	1333EDT JUL 27		
SEASIDE	46.0N	123.9W	1449PDT JUL 27		
WASHINGTON					
WESTPORT	46.9N	124.1W	1500PDT JUL 27		
NEAH BAY	48.4N	124.6W	1510PDT JUL 27		
BRITISH COLUMBIA					
TOFINO	49.2N	125.9W	1520PDT JUL 27		

LAT - LATITUDE/ N-NORTH, S-SOUTH/
LON - LONGITUDE/ E-EAST, W-WEST/
ARRIVAL TIME - EXPECTED TIME OF INITIAL TSUNAMI ARRIVAL
FCST AMP - FORECAST TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
OBS AMP - OBSERVED TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS/M/ AND FEET/F/.

&&

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1207 AKDT 27 JUL 2010
 1307 PDT 27 JUL 2010
 2007 UTC 27 JUL 2010
COORDINATES - 40.0 NORTH 124.5 WEST
DEPTH - 9 MILES/15 KM
LOCATION - 55 MILES/89 KM SW OF EUREKA CALIFORNIA
 190 MILES/306 KM NW OF SAN FRANCISCO CALIFORNIA
MAGNITUDE - 7.7

PZZ530-CAZ529-530-006-505>509-002-001-ORZ021-022-002-272139-
/T.NEW.PAAQ.TS.W.0013.100727T2039Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING RAGGED POINT
CALIFORNIA/45 MILES NW OF SAN LUIS OBISPO/ TO CASCADE HEAD
OREGON/70 MILES SW OF PORTLAND/

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139 PM PDT TUE JUL 27 2010

...A TEST TSUNAMI WARNING IS NOW IN EFFECT WHICH INCLUDES THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM RAGGED POINT CALIFORNIA/45 MILES NW OF SAN LUIS OBISPO/ TO CASCADE HEAD OREGON/70 MILES SW OF PORTLAND/...

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

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

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

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CAZ042-043-040-041-087-039-034-035-272139-
/T.NEW.PAAQ.TS.Y.0013.100727T2039Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO
BORDER TO RAGGED POINT CALIFORNIA/45 MILES NW OF SAN LUIS
OBISPO/
139 PM PDT TUE JUL 27 2010

...A TEST TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO RAGGED POINT CALIFORNIA/45 MILES NW OF SAN LUIS OBISPO/...

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

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

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

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ORZ001-WAZ001-021-510-514>517-503-272139-
/T.NEW.PAAQ.TS.Y.0013.100727T2039Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING CASCADE HEAD OREGON/70
MILES SW OF PORTLAND/ TO THE NORTH TIP OF VANCOUVER ISLAND
BRITISH COLUMBIA
139 PM PDT TUE JUL 27 2010

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...A TEST TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE COASTAL AREAS OF OREGON - WASHINGTON AND BRITISH COLUMBIA FROM CASCADE HEAD OREGON/70 MILES SW OF PORTLAND/ TO THE NORTH TIP OF VANCOUVER ISLAND BRITISH COLUMBIA...

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

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

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

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1.2 Pacific AOR Warning/Watch/Advisory Cancellation (WEPA41 PAAQ)

WEPA41 PAAQ 272053
TSUWCA

BULLETIN
TSUNAMI MESSAGE NUMBER 2
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
153 PM PDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEPA41 CANCELLATION MESSAGE...

...THE TEST TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS
OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO RAGGED
POINT CALIFORNIA/45 MILES NW OF SAN LUIS OBISPO/...

...THE TEST TSUNAMI WARNING IS CANCELED FOR THE COASTAL AREAS OF
CALIFORNIA AND OREGON FROM RAGGED POINT CALIFORNIA/45 MILES
NW OF SAN LUIS OBISPO/ TO CASCADE HEAD OREGON/70 MILES SW
OF PORTLAND/...

...THE TEST TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS
OF OREGON - WASHINGTON AND BRITISH COLUMBIA FROM CASCADE
HEAD OREGON/70 MILES SW OF PORTLAND/ TO THE NORTH TIP OF
VANCOUVER ISLAND BRITISH COLUMBIA...

EVALUATION

NO DESTRUCTIVE TSUNAMI HAS BEEN RECORDED. NO TSUNAMI DANGER
EXISTS FOR ALASKA/ BRITISH COLUMBIA/ WASHINGTON/ OREGON OR
CALIFORNIA. LOCAL AUTHORITIES CAN ASSUME ALL CLEAR UPON
RECEIPT OF THIS MESSAGE.

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

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

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1200 AKDT 27 JUL 2010
 1300 PDT 27 JUL 2010
 2000 UTC 27 JUL 2010
COORDINATES - 40.0 NORTH 124.5 WEST
DEPTH - 9 MILES/15 KM
LOCATION - 55 MILES/89 KM SW OF EUREKA CALIFORNIA
 190 MILES/306 KM NW OF SAN FRANCISCO CALIFORNIA
MAGNITUDE - 7.7

CAZ042-043-040-041-087-039-034-035-272253-
/T.CAN.PAAQ.TS.Y.0013.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING THE CALIFORNIA-MEXICO
BORDER TO RAGGED POINT CALIFORNIA/45 MILES NW OF SAN LUIS
OBISPO/
153 PM PDT TUE JUL 27 2010

NWSI 10-701 MARCH 28, 2012

...THE TEST TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS OF CALIFORNIA FROM THE CALIFORNIA-MEXICO BORDER TO RAGGED POINT CALIFORNIA/45 MILES NW OF SAN LUIS OBISPO/...

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

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PZZ530-CAZ529-530-006-505>509-002-001-ORZ021-022-002-272253-
/T.CAN.PAAQ.TS.W.0013.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING RAGGED POINT CALIFORNIA/45 MILES NW OF SAN LUIS OBISPO/ TO CASCADE HEAD OREGON/70 MILES SW OF PORTLAND/
153 PM PDT TUE JUL 27 2010

...THE TEST TSUNAMI WARNING IS CANCELED FOR THE COASTAL AREAS OF CALIFORNIA AND OREGON FROM RAGGED POINT CALIFORNIA/45 MILES NW OF SAN LUIS OBISPO/ TO CASCADE HEAD OREGON/70 MILES SW OF PORTLAND/...

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

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ORZ001-WAZ001-021-510-514>517-503-272253-
/T.CAN.PAAQ.TS.Y.0013.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING CASCADE HEAD OREGON/70 MILES SW OF PORTLAND/ TO THE NORTH TIP OF VANCOUVER ISLAND BRITISH COLUMBIA
153 PM PDT TUE JUL 27 2010

...THE TEST TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS OF OREGON - WASHINGTON AND BRITISH COLUMBIA FROM CASCADE HEAD OREGON/70 MILES SW OF PORTLAND/ TO THE NORTH TIP OF VANCOUVER ISLAND BRITISH COLUMBIA...

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

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST MESSAGE.

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1.3 Pacific AOR Tsunami Information Statement (WEPA43 PAAQ)

WEPA43 PAAQ 272103
TIBWCA

TSUNAMI INFORMATION STATEMENT NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
103 PM AKDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEPA43 MESSAGE...

...THIS TSUNAMI INFORMATION STATEMENT IS FOR ALASKA/ BRITISH
COLUMBIA/ WASHINGTON/ OREGON AND CALIFORNIA ONLY...

NO WARNING... NO WATCH AND NO ADVISORY IS IN EFFECT FOR
THE STATES AND PROVINCES PREVIOUSLY LISTED.

EVALUATION

BASED ON MAGNITUDE... LOCATION AND HISTORIC TSUNAMI RECORDS THE
EARTHQUAKE WAS NOT SUFFICIENT TO GENERATE A TSUNAMI DAMAGING TO
CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA OR ALASKA. SOME
OF THESE AREAS MAY EXPERIENCE NON-DAMAGING SEA LEVEL CHANGES. IN
COASTAL AREAS OF INTENSE SHAKING LOCALLY GENERATED TSUNAMIS CAN
BE TRIGGERED BY UNDERWATER LANDSLIDES.

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

THIS WILL BE THE ONLY STATEMENT ISSUED FOR THIS EVENT BY THE
WEST COAST/ALASKA TSUNAMI WARNING CENTER UNLESS ADDITIONAL
INFORMATION BECOMES AVAILABLE. REFER TO THE INTERNET SITE
WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

&&

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1300 AKDT 27 JUL 2010
 1400 PDT 27 JUL 2010
 2100 UTC 27 JUL 2010
COORDINATES - 54.3 NORTH 160.8 WEST
DEPTH - 21 MILES/33 KM
LOCATION - 70 MILES/113 KM S OF SAND POINT ALASKA
 625 MILES/1006 KM SW OF ANCHORAGE ALASKA
MAGNITUDE - 6.8

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

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1.4 Alaska Tsunami Seismic Information Statement (SEAK71 PAAQ)

SEAK71 PAAQ 272107
EQIAKX

TSUNAMI SEISMIC INFORMATION STATEMENT
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
107 PM AKDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
SEAK71 MESSAGE...

...THIS IS AN INFORMATION STATEMENT...

EVALUATION

AT 105 PM ALASKAN DAYLIGHT TIME ON JULY 27 AN EARTHQUAKE WITH
PRELIMINARY MAGNITUDE 6.0 OCCURRED 50 MILES/80 KM WEST OF
CAPE YAKATAGA ALASKA. NO TSUNAMI IS EXPECTED.

THE LOCATION AND MAGNITUDE ARE BASED ON PRELIMINARY INFORMATION.
FURTHER INFORMATION WILL BE ISSUED BY THE UNITED STATES
GEOLOGICAL SURVEY - EARTHQUAKE.USGS.GOV - OR THE APPROPRIATE
REGIONAL SEISMIC NETWORK.

THIS WILL BE THE ONLY WCATWC MESSAGE ISSUED FOR THIS EVENT.

&&

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1305 AKDT 27 JUL 2010
 1405 PDT 27 JUL 2010
 2105 UTC 27 JUL 2010
COORDINATES - 60.1 NORTH 143.8 WEST
DEPTH - 21 MILES/33 KM
LOCATION - 50 MILES/80 KM W OF CAPE YAKATAGA ALASKA
 220 MILES/354 KM SE OF ANCHORAGE ALASKA
MAGNITUDE - 6.0

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

\$\$

1.5 U.S. West Coast Tsunami Seismic Information Statement (SEUS71 PAAQ)

SEUS71 PAAQ 272109
EQIWOC

TSUNAMI SEISMIC INFORMATION STATEMENT
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
209 PM PDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
SEUS71 MESSAGE...

...THIS IS AN INFORMATION STATEMENT...

EVALUATION

AT 107 PM ALASKAN DAYLIGHT TIME ON JULY 27 AN EARTHQUAKE WITH
PRELIMINARY MAGNITUDE 5.9 OCCURRED 45 MILES/72 KM SOUTHWEST OF
MONTEREY CALIFORNIA. NO TSUNAMI IS EXPECTED.

THE LOCATION AND MAGNITUDE ARE BASED ON PRELIMINARY INFORMATION.
FURTHER INFORMATION WILL BE ISSUED BY THE UNITED STATES
GEOLOGICAL SURVEY - EARTHQUAKE.USGS.GOV - OR THE APPROPRIATE
REGIONAL SEISMIC NETWORK.

THIS WILL BE THE ONLY WCATWC MESSAGE ISSUED FOR THIS EVENT.

&&

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1307 AKDT 27 JUL 2010
 1407 PDT 27 JUL 2010
 2107 UTC 27 JUL 2010
COORDINATES - 36.0 NORTH 122.2 WEST
DEPTH - 21 MILES/33 KM
LOCATION - 45 MILES/72 KM SW OF MONTEREY CALIFORNIA
 125 MILES/201 KM S OF SAN FRANCISCO CALIFORNIA
MAGNITUDE - 5.9

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

\$\$

1.6 Atlantic AOR Tsunami Warning/Watch/Advisory (WEXX20 PAAQ)

WEXX20 PAAQ 272117
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 2
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
517 PM AST TUE JUL 27 2010

UPDATES IN THIS MESSAGES INCLUDE AN EXPANDED ADVISORY
REGION AND AN OBSERVED TSUNAMI IN PUERTO RICO.

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEXX20 MESSAGE...

...THE TEST TSUNAMI WARNING CONTINUES IN EFFECT FOR PUERTO RICO
AND THE VIRGIN ISLANDS...

...A TEST TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF SOUTH CAROLINA - NORTH CAROLINA - VIRGINIA
- MARYLAND - DELAWARE - NEW JERSEY - NEW YORK - CONNECTICUT
- RHODE ISLAND - MASSACHUSETTS - NEW HAMPSHIRE - MAINE -
NEW BRUNSWICK - NOVA SCOTIA AND NEWFOUNDLAND FROM SOUTH
SANTEE RIVER SOUTH CAROLINA TO BOAT HARBOUR NEWFOUNDLAND...

...THIS TEST MESSAGE IS INFORMATION ONLY FOR COASTAL AREAS OF
TEXAS - LOUISIANA - MISSISSIPPI - ALABAMA - FLORIDA -
GEORGIA AND SOUTH CAROLINA FROM BROWNSVILLE TEXAS TO SOUTH
SANTEE RIVER SOUTH CAROLINA...

...THIS TEST MESSAGE IS INFORMATION ONLY FOR COASTAL AREAS OF
NEWFOUNDLAND AND LABRADOR FROM BOAT HARBOUR NEWFOUNDLAND TO
CAPE CHIDLEY LABRADOR...

RECOMMENDED ACTIONS

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

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

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

TSUNAMI ADVISORIES MEAN THAT A TSUNAMI CAPABLE OF PRODUCING
STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR THE
WATER IS IMMINENT... EXPECTED OR OCCURING. 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.

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CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

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

&&

MEASUREMENTS AND/OR FORECASTS OF TSUNAMI ACTIVITY

SITE	LAT	LON	ARRIVAL TIME	FCST AMP	OBS AMP

PUERTO RICO					
SAN JUAN	18.5N	66.1W	1724AST JUL 27	3.6F/1.1M	4.0F/1.3M
MAYAGUEZ	18.2N	67.2W	1735AST JUL 27	6.6F/2.0M	6.8F/2.1M
VIRGIN ISLANDS					
CHRISTIANSTED	17.8N	64.7W	1754AST JUL 27	6.6F/2.0M	6.8F/2.1M
CHARLOTTE AMALIE	18.3N	64.9W	1807AST JUL 27	6.6F/2.0M	
NORTH CAROLINA					
CAPE HATTERAS	18.5N	66.1W	2018EDT JUL 27	3.0F/0.9M	
VIRGINIA					
VIRGINIA BEACH	17.8N	64.7W	2152EDT JUL 27	2.1F/0.6M	
NEW YORK					
MONTAUK	41.1N	72.0W	2150EDT JUL 27	1.1F/0.3M	
MANHATTAN	40.7N	74.0W	2315EDT JUL 27	2.1F/0.6M	
NOVA SCOTIA					
LOCKEPORT	43.7N	65.1W	2244ADT JUL 27	1.0F/0.3M	
SCATARIE ISLAND	46.0N	59.7W	2340ADT JUL 27	2.1F/0.6M	

LAT - LATITUDE/ N-NORTH, S-SOUTH/
LON - LONGITUDE/ E-EAST, W-WEST/
ARRIVAL TIME - EXPECTED TIME OF INITIAL TSUNAMI ARRIVAL
FCST AMP - FORECAST TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
OBS AMP - OBSERVED TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS/M/ AND FEET/F/.

&&

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1710 EDT JUL 27 2010
 1710 AST JUL 27 2010
 1610 CDT JUL 27 2010
 2110 UTC JUL 27 2010
COORDINATES - 18.5 NORTH 66.5 WEST
DEPTH - 21 MILES/33 KM
LOCATION - 30 MILES/48 KM NE OF MAYAGUEZ PUERTO RICO
 45 MILES/72 KM W OF SAN JUAN PUERTO RICO
MAGNITUDE - 7.6

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-272217-
/T.CON.PAAQ.TS.W.0014.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
517 PM AST TUE JUL 27 2010

NWSI 10-701 MARCH 28, 2012

...THE TEST TSUNAMI WARNING CONTINUES IN EFFECT FOR PUERTO RICO
AND THE VIRGIN ISLANDS...

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

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

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

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AMZ250-252-254-256-130-135-150-152-154-156-158-ANZ631>633-
656-658-650-652-654-430-431-450>455-330-335-338-340-345-350-
353-355-230>237-250-254-255-256-150-050>052-081-SCZ034-046-
NCZ097-100-101-045>047-080-081-094-095-098-103-104-015>017-
030>032-102-VAZ084-086-091-094-095-098-099-100-MDZ025-DEZ002>004-
NJZ005-006-011>014-021-023>026-NYZ071>081-CTZ009>012-RIZ002-
004>008-MAZ007-016-019>024-NHZ014-MEZ022>028-029-030-272217-
/T.NEW.PAAQ.TS.Y.0014.100727T2117Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING SOUTH SANTEE RIVER
SOUTH CAROLINA TO BOAT HARBOUR NEWFOUNDLAND
517 PM AST TUE JUL 27 2010

...A TEST TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF SOUTH CAROLINA - NORTH CAROLINA - VIRGINIA
- MARYLAND - DELAWARE - NEW JERSEY - NEW YORK - CONNECTICUT
- RHODE ISLAND - MASSACHUSETTS - NEW HAMPSHIRE - MAINE -
NEW BRUNSWICK - NOVA SCOTIA AND NEWFOUNDLAND FROM SOUTH
SANTEE RIVER SOUTH CAROLINA TO BOAT HARBOUR NEWFOUNDLAND...

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

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

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

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

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1.7 Atlantic AOR Warning/Watch/Advisory Cancellation (WEXX20 PAAQ)

WEXX20 PAAQ 272131
TSUAT1

BULLETIN

TSUNAMI MESSAGE NUMBER 3
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
531 PM AST TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEXX20 CANCELLATION MESSAGE...

...THE TEST TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS
OF SOUTH CAROLINA - NORTH CAROLINA - VIRGINIA - MARYLAND -
DELAWARE - NEW JERSEY - NEW YORK - CONNECTICUT - RHODE
ISLAND - MASSACHUSETTS - NEW HAMPSHIRE - MAINE - NEW
BRUNSWICK - NOVA SCOTIA AND NEWFOUNDLAND FROM SOUTH SANTEE
RIVER SOUTH CAROLINA TO BOAT HARBOUR NEWFOUNDLAND...

...THE TEST TSUNAMI WARNING IS CANCELED FOR PUERTO RICO AND THE
VIRGIN ISLANDS...

EVALUATION

DAMAGING TSUNAMIS ARE NO LONGER EXPECTED ALONG THE ATLANTIC
COASTS OF THE U.S. AND CANADA. AS LOCAL CONDITIONS CAN CAUSE
A WIDE VARIATION IN TSUNAMI WAVE ACTION THE ALL CLEAR
DETERMINATIONS WILL BE MADE BY LOCAL AUTHORITIES.

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

CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN
ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES
FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

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

&&

MEASUREMENTS OF TSUNAMI ACTIVITY

SITE	LAT	LON	OBS TIME	OBS AMP

PUERTO RICO				
SAN JUAN	18.5N	66.1W	1724AST JUL 27	4.0F/1.3M
MAYAGUEZ	18.2N	67.2W	1735AST JUL 27	6.8F/2.1M
VIRGIN ISLANDS				
CHRISTIANSTED	17.8N	64.7W	1754AST JUL 27	6.8F/2.1M
CHARLOTTE AMALIE	18.3N	64.9W	1807AST JUL 27	6.9F/2.1M

LAT - LATITUDE/ N-NORTH, S-SOUTH/
LON - LONGITUDE/ E-EAST, W-WEST/
OBS TIME - TIME OF OBSERVED AMPLITUDE

NWSI 10-701 MARCH 28, 2012

OBS AMP - OBSERVED TSUNAMI ELEVATION ABOVE AMBIENT SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS/M/ AND FEET/F/.

&&

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1710 EDT JUL 27 2010
 1710 AST JUL 27 2010
 1610 CDT JUL 27 2010
 2110 UTC JUL 27 2010
COORDINATES - 18.5 NORTH 66.5 WEST
DEPTH - 21 MILES/33 KM
LOCATION - 30 MILES/48 KM NE OF MAYAGUEZ PUERTO RICO
 45 MILES/72 KM W OF SAN JUAN PUERTO RICO
MAGNITUDE - 7.6

AMZ250-252-254-256-130-135-150-152-154-156-158-ANZ631>633-
656-658-650-652-654-430-431-450>455-330-335-338-340-345-350-
353-355-230>237-250-254-255-256-150-050>052-081-SCZ034-046-
NCZ097-100-101-045>047-080-081-094-095-098-103-104-015>017-
030>032-102-VAZ084-086-091-094-095-098-099-100-MDZ025-DEZ002>004-
NJZ005-006-011>014-021-023>026-NYZ071>081-CTZ009>012-RIZ002-
004>008-MAZ007-016-019>024-NHZ014-MEZ022>028-029-030-272331-
/T.CAN.PAAQ.TS.Y.0014.000000T0000Z-000000T0000Z/
COASTAL AREAS BETWEEN AND INCLUDING SOUTH SANTEE RIVER
SOUTH CAROLINA TO BOAT HARBOUR NEWFOUNDLAND
531 PM AST TUE JUL 27 2010

...THE TEST TSUNAMI ADVISORY IS CANCELED FOR THE COASTAL AREAS
OF SOUTH CAROLINA - NORTH CAROLINA - VIRGINIA - MARYLAND -
DELAWARE - NEW JERSEY - NEW YORK - CONNECTICUT - RHODE
ISLAND - MASSACHUSETTS - NEW HAMPSHIRE - MAINE - NEW
BRUNSWICK - NOVA SCOTIA AND NEWFOUNDLAND FROM SOUTH SANTEE
RIVER SOUTH CAROLINA TO BOAT HARBOUR NEWFOUNDLAND...

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

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AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-272331-
/T.CAN.PAAQ.TS.W.0014.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
531 PM AST TUE JUL 27 2010

...THE TEST TSUNAMI WARNING IS CANCELED FOR PUERTO RICO AND THE
VIRGIN ISLANDS...

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

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

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1.8 Atlantic AOR Tsunami Information Statement (WEXX22 PAAQ)

WEXX22 PAAQ 272137
TIBAT1

TSUNAMI INFORMATION STATEMENT NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
537 PM EDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEXX22 MESSAGE...

...THIS TSUNAMI INFORMATION STATEMENT IS FOR PUERTO RICO/
THE VIRGIN ISLANDS/ THE U.S. ATLANTIC AND GULF OF
MEXICO STATES/ AND EASTERN CANADIAN PROVINCES...

NO WARNING... NO WATCH AND NO ADVISORY IS IN EFFECT FOR
THESE AREAS.

EVALUATION

BASED ON EARTHQUAKE DATA AND HISTORIC TSUNAMI RECORDS THE
EARTHQUAKE WAS NOT SUFFICIENT TO GENERATE A TSUNAMI DAMAGING TO
PUERTO RICO/ THE VIRGIN ISLANDS/ THE U.S. ATLANTIC AND GULF
OF MEXICO COASTS/ AND EASTERN CANADA.

HOWEVER - EARTHQUAKES OF THIS SIZE SOMETIMES GENERATE
TSUNAMIS THAT CAN BE DESTRUCTIVE ALONG COASTS LOCATED IN THE
REGION OF THE EARTHQUAKE EPICENTER. AUTHORITIES IN THE REGION
SHOULD BE AWARE OF THIS POSSIBILITY AND TAKE APPROPRIATE ACTION.

CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN
ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES
FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS WILL BE THE ONLY STATEMENT ISSUED FOR THIS EVENT BY THE
WEST COAST/ALASKA TSUNAMI WARNING CENTER UNLESS ADDITIONAL
INFORMATION BECOMES AVAILABLE. REFER TO THE INTERNET SITE
WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

&&

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1730 EDT JUL 27 2010
 1730 AST JUL 27 2010
 1630 CDT JUL 27 2010
 2130 UTC JUL 27 2010
COORDINATES - 39.0 NORTH 13.3 WEST
DEPTH - 16 MILES/25 KM
LOCATION - NORTH ATLANTIC OCEAN
MAGNITUDE - 6.9

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

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1.9 Atlantic AOR Tsunami Seismic Information Statement (SEXX60 PAAQ)

SEXX60 PAAQ 272140
EQIAT1

TSUNAMI SEISMIC INFORMATION STATEMENT
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
540 PM EDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
SEXX60 MESSAGE...

...THIS IS AN INFORMATION STATEMENT...

EVALUATION

AT 535 PM EASTERN DAYLIGHT TIME ON JULY 27 AN EARTHQUAKE WITH
PRELIMINARY MAGNITUDE 5.6 OCCURRED 45 MILES/72 KM SOUTHEAST OF
ALLENTOWN PENNSYLVANIA. NO TSUNAMI IS EXPECTED.

THE LOCATION AND MAGNITUDE ARE BASED ON PRELIMINARY INFORMATION.
FURTHER INFORMATION WILL BE ISSUED BY THE UNITED STATES
GEOLOGICAL SURVEY - EARTHQUAKE.USGS.GOV - OR THE APPROPRIATE
REGIONAL SEISMIC NETWORK.

THIS WILL BE THE ONLY WCATWC MESSAGE ISSUED FOR THIS EVENT.

&&

PRELIMINARY EARTHQUAKE PARAMETERS

ORIGIN TIME - 1735 EDT JUL 27 2010
 1735 AST JUL 27 2010
 1635 CDT JUL 27 2010
 2135 UTC JUL 27 2010
COORDINATES - 40.4 NORTH 74.7 WEST
DEPTH - 7 MILES/12 KM
LOCATION - 45 MILES/72 KM SE OF ALLENTOWN PENNSYLVANIA
 40 MILES/64 KM NE OF PHILADELPHIA PENNSYLVANIA
MAGNITUDE - 5.6

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

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1.10 West Coast/Alaska AOR Public Tsunami Warning/Watch/Advisory (WEAK51 PAAQ)

WEAK51 PAAQ 272143
TSUAK1

BULLETIN

PUBLIC TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
143 PM AKDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEAK51 MESSAGE...

...A TEST TSUNAMI WARNING IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF ALASKA FROM CHIGNIK BAY ALASKA TO ATTU
ALASKA...

...A TEST TSUNAMI WATCH IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF CALIFORNIA - OREGON - WASHINGTON - BRITISH
COLUMBIA AND ALASKA FROM THE CALIFORNIA-MEXICO BORDER TO
CHIGNIK BAY ALASKA...

A TSUNAMI WARNING MEANS... ALL COASTAL RESIDENTS IN THE WARNING
AREA WHO ARE NEAR THE BEACH OR IN LOW-LYING REGIONS SHOULD MOVE
IMMEDIATELY INLAND TO HIGHER GROUND AND AWAY FROM ALL HARBORS AND
INLETS INCLUDING THOSE SHELTERED DIRECTLY FROM THE SEA. THOSE
FEELING THE EARTH SHAKE... SEEING UNUSUAL WAVE ACTION... OR THE
WATER LEVEL RISING OR RECEDING MAY HAVE ONLY A FEW MINUTES BEFORE
THE TSUNAMI ARRIVAL AND SHOULD MOVE IMMEDIATELY. HOMES AND
SMALL BUILDINGS ARE NOT DESIGNED TO WITHSTAND TSUNAMI IMPACTS.
DO NOT STAY IN THESE STRUCTURES.

ALL RESIDENTS WITHIN THE WARNED AREA SHOULD BE ALERT FOR
INSTRUCTIONS BROADCAST FROM THEIR LOCAL CIVIL AUTHORITIES. EARTHQUAKES
OF THIS MAGNITUDE ARE KNOWN TO GENERATE TSUNAMIS.

A TSUNAMI WATCH MEANS... ALL COASTAL RESIDENTS IN THE WATCH AREA
SHOULD PREPARE FOR POSSIBLE EVACUATION. A TSUNAMI WATCH IS ISSUED
TO AREAS WHICH WILL NOT BE IMMEDIATELY IMPACTED BY THE TSUNAMI.
WATCH AREAS WILL EITHER BE UPGRADED TO WARNING OR ADVISORY STATUS
OR CANCELED.

AT 140 PM ALASKAN DAYLIGHT TIME ON JULY 27 AN EARTHQUAKE WITH
PRELIMINARY MAGNITUDE 7.9 OCCURRED 90 MILES/145 KM NORTHWEST OF
ADAK ALASKA.

THIS EARTHQUAKE MAY HAVE GENERATED A TSUNAMI.
IF A TSUNAMI HAS BEEN GENERATED THE WAVES WILL FIRST REACH
ADAK ALASKA AT 210 PM AKDT ON JULY 27.
ESTIMATED TSUNAMI ARRIVAL TIMES AND MAPS ALONG WITH SAFETY RULES
AND OTHER INFORMATION CAN BE FOUND ON THE WEB SITE
WCATWC.ARH.NOAA.GOV.

TSUNAMIS CAN BE DANGEROUS WAVES THAT ARE NOT SURVIVABLE. WAVE
HEIGHTS ARE AMPLIFIED BY IRREGULAR SHORELINE AND ARE DIFFICULT TO
FORECAST. TSUNAMIS OFTEN APPEAR AS A STRONG SURGE AND MAY BE
PRECEDED BY A RECEDING WATER LEVEL. MARINERS IN WATER DEEPER
THAN 600 FEET SHOULD NOT BE AFFECTED BY A TSUNAMI. WAVE HEIGHTS

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WILL INCREASE RAPIDLY AS WATER SHALLOWS. TSUNAMIS ARE A SERIES OF OCEAN WAVES WHICH CAN BE DANGEROUS FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL. DO NOT RETURN TO EVACUATED AREAS UNTIL AN ALL CLEAR IS GIVEN BY LOCAL CIVIL AUTHORITIES.

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

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. FOR FURTHER INFORMATION STAY TUNED TO NOAA WEATHER RADIO... YOUR LOCAL TV OR RADIO STATIONS... OR SEE THE WEB SITE WCATWC.ARH.NOAA.GOV.

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST MESSAGE.

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NWSI 10-701 MARCH 28, 2012

1.11 West Coast/Alaska AOR Public Tsunami Information Statement (WEAK53 PAAQ)

WEAK53 PAAQ 272146
TIBAK1

PUBLIC TSUNAMI INFORMATION STATEMENT NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
246 PM PDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEAK53 MESSAGE...

...A STRONG EARTHQUAKE HAS OCCURRED BUT A TSUNAMI IS NOT
EXPECTED ALONG THE CALIFORNIA/ OREGON/ WASHINGTON/
BRITISH COLUMBIA OR ALASKA COASTS...

NO WARNING... NO WATCH AND NO ADVISORY IS IN EFFECT FOR
THESE AREAS.

BASED ON THE EARTHQUAKE MAGNITUDE... LOCATION AND HISTORIC
TSUNAMI RECORDS A DAMAGING TSUNAMI IS NOT EXPECTED ALONG
THE CALIFORNIA/ OREGON/ WASHINGTON/ BRITISH COLUMBIA AND ALASKA
COASTS. AT COASTAL LOCATIONS WHICH HAVE EXPERIENCED
STRONG GROUND SHAKING LOCAL TSUNAMIS ARE POSSIBLE DUE
TO UNDERWATER LANDSLIDES.

AT 245 PM PACIFIC DAYLIGHT TIME ON JULY 27 AN EARTHQUAKE WITH
PRELIMINARY MAGNITUDE 6.9 OCCURRED
SOUTH OF THE FIJI ISLANDS.

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

THIS WILL BE THE ONLY STATEMENT ISSUED FOR THIS EVENT BY THE
WEST COAST/ALASKA TSUNAMI WARNING CENTER UNLESS ADDITIONAL
INFORMATION BECOMES AVAILABLE. SEE THE WEB SITE WCATWC.ARH.NOAA.GOV
FOR BASIC TSUNAMI INFORMATION - SAFETY RULES AND TSUNAMI TRAVEL
TIMES.

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

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1.12 Atlantic AOR Public Tsunami Warning/Watch/Advisory (WEXX30 PAAQ)

WEXX30 PAAQ 272149
TSUATE

BULLETIN

PUBLIC TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
549 PM EDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEXX30 MESSAGE...

...A TEST TSUNAMI WARNING IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF NOVA SCOTIA AND NEWFOUNDLAND FROM
CHEZZETCOOK NOVA SCOTIA TO BOAT HARBOUR NEWFOUNDLAND...

...A TEST TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF MAINE - NEW BRUNSWICK AND NOVA SCOTIA FROM
STONINGTON MAINE TO CHEZZETCOOK NOVA SCOTIA...

...A TEST TSUNAMI ADVISORY IS NOW IN EFFECT WHICH INCLUDES THE
COASTAL AREAS OF NEWFOUNDLAND AND LABRADOR FROM BOAT
HARBOUR NEWFOUNDLAND TO CAPE CHIDLEY LABRADOR...

...THIS MESSAGE IS INFORMATION ONLY FOR COASTAL AREAS OF
TEXAS - LOUISIANA - MISSISSIPPI - ALABAMA - FLORIDA -
GEORGIA - SOUTH CAROLINA - NORTH CAROLINA - VIRGINIA -
MARYLAND - DELAWARE - NEW JERSEY - NEW YORK - CONNECTICUT -
RHODE ISLAND - MASSACHUSETTS - NEW HAMPSHIRE AND MAINE FROM
BROWNSVILLE TEXAS TO STONINGTON MAINE...

...THIS MESSAGE IS INFORMATION ONLY FOR COASTAL AREAS OF
PUERTO RICO AND THE VIRGIN ISLANDS...

A TSUNAMI WARNING MEANS... ALL COASTAL RESIDENTS IN THE WARNING
AREA WHO ARE NEAR THE BEACH OR IN LOW-LYING REGIONS SHOULD MOVE
IMMEDIATELY INLAND TO HIGHER GROUND AND AWAY FROM ALL HARBORS AND
INLETS INCLUDING THOSE SHELTERED DIRECTLY FROM THE SEA. THOSE
FEELING THE EARTH SHAKE... SEEING UNUSUAL WAVE ACTION... OR THE
WATER LEVEL RISING OR RECEDING MAY HAVE ONLY A FEW MINUTES BEFORE
THE TSUNAMI ARRIVAL AND SHOULD MOVE IMMEDIATELY. HOMES AND
SMALL BUILDINGS ARE NOT DESIGNED TO WITHSTAND TSUNAMI IMPACTS.
DO NOT STAY IN THESE STRUCTURES.

ALL RESIDENTS WITHIN THE WARNED AREA SHOULD BE ALERT FOR
INSTRUCTIONS BROADCAST FROM THEIR LOCAL CIVIL AUTHORITIES.
EARTHQUAKES OF THIS MAGNITUDE ARE KNOWN TO GENERATE TSUNAMIS.
A TSUNAMI ADVISORY MEANS THAT A TSUNAMI CAPABLE OF PRODUCING
STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR
THE WATER IS EXPECTED. SIGNIFICANT WIDESPREAD INUNDATION
IS NOT EXPECTED FOR AREAS UNDER AN ADVISORY. CURRENTS
MAY BE HAZARDOUS TO SWIMMERS... BOATS... AND COASTAL
STRUCTURES AND MAY CONTINUE FOR SEVERAL HOURS AFTER THE
INITIAL WAVE ARRIVAL.

AT 547 PM EASTERN DAYLIGHT TIME ON JULY 27 AN EARTHQUAKE WITH
PRELIMINARY MAGNITUDE 7.6 OCCURRED
IN THE NORTH ATLANTIC OCEAN.

NWSI 10-701 MARCH 28, 2012

THIS EARTHQUAKE MAY HAVE GENERATED A TSUNAMI.
IF A TSUNAMI HAS BEEN GENERATED THE WAVES WILL FIRST REACH
ST LAWRENCE NEWFOUNDLAND AT 906 PM NDT ON JULY 27.
ESTIMATED TSUNAMI ARRIVAL TIMES AND MAPS ALONG WITH SAFETY RULES
AND OTHER INFORMATION CAN BE FOUND ON THE WEB SITE
WCATWC.ARH.NOAA.GOV.

TSUNAMIS CAN BE DANGEROUS WAVES THAT ARE NOT SURVIVABLE. WAVE
HEIGHTS ARE AMPLIFIED BY IRREGULAR SHORELINE AND ARE DIFFICULT TO
FORECAST. TSUNAMIS OFTEN APPEAR AS A STRONG SURGE AND MAY BE
PRECEDED BY A RECEDING WATER LEVEL. MARINERS IN WATER DEEPER
THAN 600 FEET SHOULD NOT BE AFFECTED BY A TSUNAMI. WAVE HEIGHTS
WILL INCREASE RAPIDLY AS WATER SHALLOWS. TSUNAMIS ARE A SERIES OF
OCEAN WAVES WHICH CAN BE DANGEROUS FOR SEVERAL HOURS AFTER THE
INITIAL WAVE ARRIVAL. DO NOT RETURN TO EVACUATED AREAS UNTIL AN
ALL CLEAR IS GIVEN BY LOCAL CIVIL AUTHORITIES.

CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN
ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES
FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF
THE SITUATION WARRANTS. THE TSUNAMI MESSAGE WILL REMAIN
IN EFFECT UNTIL FURTHER NOTICE. FOR FURTHER INFORMATION STAY TUNED
TO NOAA WEATHER RADIO... YOUR LOCAL TV OR RADIO STATIONS... OR SEE
THE WEB SITE WCATWC.ARH.NOAA.GOV.

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

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1.13 Atlantic AOR Public Tsunami Information Statement (WEXX32 PAAQ)

WEXX32 PAAQ 272155
TIBATE

PUBLIC TSUNAMI INFORMATION STATEMENT NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
555 PM EDT TUE JUL 27 2010

...THIS MESSAGE IS FOR TEST PURPOSES TO SHOW AN EXAMPLE
WEXX32 MESSAGE...

...A STRONG EARTHQUAKE HAS OCCURRED BUT A TSUNAMI IS NOT
EXPECTED ALONG THE COASTS OF PUERTO RICO/ THE VIRGIN
ISLANDS/ U.S. ATLANTIC AND GULF OF MEXICO STATES/ AND EASTERN
CANADIAN PROVINCES...

NO WARNING... NO WATCH AND NO ADVISORY IS IN EFFECT FOR
THESE AREAS.

BASED ON THE EARTHQUAKE LOCATION NEAR THE MID-ATLANTIC RIDGE A
TSUNAMI IS NOT EXPECTED ALONG THE PUERTO RICO/
VIRGIN ISLANDS/ U.S. ATLANTIC/ EASTERN CANADIAN AND GULF OF
MEXICO COASTS. EARTHQUAKES IN THIS REGION HAVE NOT HISTORICALLY
GENERATED TSUNAMIS.

AT 550 PM EASTERN DAYLIGHT TIME ON JULY 27 AN EARTHQUAKE WITH
PRELIMINARY MAGNITUDE 7.8 OCCURRED
NEAR THE NORTHERN MID-ATLANTIC RIDGE.

CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN
ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES
FOR INFORMATION ON THIS EVENT AT WWW.WEATHER.GOV/PTWC.

THIS WILL BE THE ONLY STATEMENT ISSUED FOR THIS EVENT BY THE
WEST COAST/ALASKA TSUNAMI WARNING CENTER UNLESS ADDITIONAL
INFORMATION BECOMES AVAILABLE. SEE THE WEB SITE WCATWC.ARH.NOAA.GOV
FOR BASIC TSUNAMI INFORMATION - SAFETY RULES AND TSUNAMI TRAVEL
TIMES.

THIS IS A TEST MESSAGE. DO NOT TAKE ACTION BASED ON THIS TEST
MESSAGE.

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2. PTWC Products

2.1 Tsunami Warning/Watch/Advisory for the Pacific (WEPA40 PHEB)

WEPA40 PHEB 021426
TSUPAC

TSUNAMI BULLETIN NUMBER 001
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1426Z 02 JUN 2008

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

JAPAN / RUSSIA / MARCUS IS.

A TSUNAMI WATCH IS IN EFFECT FOR

N. MARIANAS / GUAM / WAKE IS. / TAIWAN / YAP / PHILIPPINES / MARSHALL IS. /
CHUUK / POHNPEI / BELAU / MIDWAY IS. / KOSRAE / INDONESIA / PAPUA NEW GUINEA /
NAURU / HAWAII

FOR ALL OTHER AREAS COVERED BY THIS BULLETIN... IT IS FOR INFORMATION ONLY AT THIS TIME.

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 ACTION TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1415Z 02 JUN 2008
COORDINATES - 38.5 NORTH 143.1 EAST
DEPTH - 33 KM
LOCATION - OFF EAST COAST OF HONSHU JAPAN
MAGNITUDE - 8.1

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 GAUGES NEAR THE EARTHQUAKE TO DETERMINE IF A TSUNAMI WAS GENERATED AND ESTIMATE THE SEVERITY OF THE THREAT.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES

NWSI 10-701 MARCH 28, 2012

MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME	
JAPAN	KATSUURA	35.0N 140.3E	1502Z 02 JUN	
	KUSHIRO	42.9N 144.3E	1504Z 02 JUN	
	HACHINOHE	40.5N 141.7E	1508Z 02 JUN	
	SHIMIZU	32.8N 133.0E	1625Z 02 JUN	
	OKINAWA	26.2N 127.8E	1719Z 02 JUN	
RUSSIA	URUP IS	46.1N 150.5E	1538Z 02 JUN	
	PETROPAVLOVSK K	53.2N 159.6E	1646Z 02 JUN	
	SEVERO KURILSK	50.8N 156.1E	1650Z 02 JUN	
	UST KAMCHATSK	56.1N 162.6E	1708Z 02 JUN	
	MEDNNY IS	54.7N 167.4E	1709Z 02 JUN	
MARCUS IS.	MARCUS IS.	24.3N 154.0E	1627Z 02 JUN	
N. MARIANAS	SAIPAN	15.3N 145.8E	1725Z 02 JUN	
GUAM	GUAM	13.4N 144.7E	1742Z 02 JUN	
WAKE IS.	WAKE IS.	19.3N 166.6E	1753Z 02 JUN	
TAIWAN	HUALIEN	24.0N 121.7E	1803Z 02 JUN	
	TAITUNG	22.7N 121.2E	1807Z 02 JUN	
	CHILUNG	25.2N 121.8E	1830Z 02 JUN	
TAIWAN	HUALIEN	24.0N 121.6E	1803Z 02 JUN	
YAP	YAP IS.	9.5N 138.1E	1817Z 02 JUN	
PHILIPPINES	PALANAN	17.1N 122.6E	1824Z 02 JUN	
	LEGASPI	13.2N 123.8E	1907Z 02 JUN	
	DAVAO	6.8N 125.7E	1921Z 02 JUN	
MARSHALL IS.	ENIWETOK	11.4N 162.3E	1830Z 02 JUN	
	KWAJALEIN	8.7N 167.7E	1913Z 02 JUN	
	MAJURO	7.1N 171.4E	1943Z 02 JUN	
CHUUK	CHUUK IS.	7.4N 151.8E	1831Z 02 JUN	
POHNPEI	POHNPEI IS.	7.0N 158.2E	1845Z 02 JUN	
PELAU	MALAKAL	7.3N 134.5E	1846Z 02 JUN	
MIDWAY IS.	MIDWAY IS.	28.2N 177.4W	1852Z 02 JUN	
KOSRAE	KOSRAE IS.	5.5N 163.0E	1913Z 02 JUN	
INDONESIA	GEME	4.6N 126.8E	1919Z 02 JUN	
	BEREBERE	2.5N 128.7E	1928Z 02 JUN	
	WARSA	0.6S 135.8E	1944Z 02 JUN	
	MANOKWARI	0.8S 134.2E	1951Z 02 JUN	
	PATANI	0.4N 128.8E	1953Z 02 JUN	
	SORONG	0.8S 131.1E	2003Z 02 JUN	
	JAYAPURA	2.4S 140.8E	2007Z 02 JUN	
	PAPUA NEW GUINEA	KAVIENG	2.5S 150.7E	1955Z 02 JUN
		MANUS IS.	2.0S 147.5E	1956Z 02 JUN
		VANIMO	2.6S 141.3E	2007Z 02 JUN
NAURU	RABAU	4.2S 152.3E	2014Z 02 JUN	
	NAURU	0.5S 166.9E	2016Z 02 JUN	

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

THE JAPAN METEOROLOGICAL AGENCY MAY ALSO ISSUE TSUNAMI MESSAGES FOR THIS EVENT TO COUNTRIES IN THE NORTHWEST PACIFIC AND SOUTH CHINA SEA REGION. IN CASE OF CONFLICTING INFORMATION...THE MORE CONSERVATIVE INFORMATION SHOULD BE USED FOR SAFETY.

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

2.2 Tsunami Information Bulletin for the Pacific (WEPA42 PHEB)

WEPA42 PHEB 021425
TIBPAC

TSUNAMI BULLETIN NUMBER 001
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1425Z 02 JUN 2008

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

... TSUNAMI INFORMATION BULLETIN ...

THIS BULLETIN IS FOR INFORMATION ONLY.

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1415Z 02 JUN 2008
COORDINATES - 38.5 NORTH 143.1 EAST
DEPTH - 33 KM
LOCATION - OFF EAST COAST OF HONSHU JAPAN
MAGNITUDE - 6.7

EVALUATION

NO DESTRUCTIVE WIDESPREAD TSUNAMI THREAT EXISTS BASED ON HISTORICAL EARTHQUAKE AND TSUNAMI DATA.

HOWEVER - EARTHQUAKES OF THIS SIZE SOMETIMES GENERATE LOCAL TSUNAMIS THAT CAN BE DESTRUCTIVE ALONG COASTS LOCATED WITHIN A HUNDRED KILOMETERS OF THE EARTHQUAKE EPICENTER. AUTHORITIES IN THE REGION OF THE EPICENTER SHOULD BE AWARE OF THIS POSSIBILITY AND TAKE APPROPRIATE ACTION.

THIS WILL BE THE ONLY BULLETIN ISSUED FOR THIS EVENT UNLESS ADDITIONAL INFORMATION BECOMES AVAILABLE.

THE JAPAN METEOROLOGICAL AGENCY MAY ALSO ISSUE TSUNAMI MESSAGES FOR THIS EVENT TO COUNTRIES IN THE NORTHWEST PACIFIC AND SOUTH CHINA SEA REGION. IN CASE OF CONFLICTING INFORMATION...THE MORE CONSERVATIVE INFORMATION SHOULD BE USED FOR SAFETY.

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

NNNN

2.3 Tsunami Warning/Watch/Advisory for Hawaii (WEHW40 PHEB) – Pacific Event

WEHW40 PHEB 241805
TSUHWX

HIZ001>003-005>009-012>014-016>021-023>026-242005-
/O.CAN.PHEB.TS.A.0013.000000T0000Z-000000T0000Z/
/O.NEW.PHEB.TS.W.0012.100324T1805Z-000000T0000Z/

TSUNAMI MESSAGE NUMBER 2
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
805 AM HST WED MAR 24 2010

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

SUBJECT - TSUNAMI WARNING

A TSUNAMI WARNING IS ISSUED FOR THE STATE OF HAWAII EFFECTIVE AT
0805 AM HST.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 0700 AM HST 24 MAR 2010
COORDINATES - 55.0 NORTH 157.0 WEST
LOCATION - ALASKA PENINSULA
MAGNITUDE - 9.0 MOMENT
MAGNITUDE - 8.4 RICHTER (MS)

EVALUATION

BASED ON SEA LEVEL READINGS FROM DEEP OCEAN GAUGES NEAR THE
EARTHQUAKE... A SIGNIFICANT TSUNAMI HAS BEEN GENERATED THAT
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 PREDICTED AND THE FIRST WAVE MAY NOT BE THE LARGEST.
TSUNAMI WAVES EFFICIENTLY WRAP AROUND ISLANDS. ALL SHORES ARE AT
RISK NO MATTER WHICH DIRECTION THEY FACE. THE TROUGH OF A TSUNAMI
WAVE MAY TEMPORARILY EXPOSE THE SEAFLOOR BUT THE AREA WILL
QUICKLY FLOOD AGAIN. EXTREMELY STRONG AND UNUSUAL NEARSHORE
CURRENTS CAN ACCOMPANY A TSUNAMI. DEBRIS PICKED UP AND CARRIED
BY A TSUNAMI AMPLIFIES ITS DESTRUCTIVE POWER. SIMULTANEOUS HIGH
TIDES OR HIGH SURF CAN SIGNIFICANTLY INCREASE THE TSUNAMI HAZARD.

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

1133 AM HST WED 24 MAR 2010

MESSAGES WILL BE ISSUED HOURLY OR SOONER AS CONDITIONS WARRANT.

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NNNN

2.4 Tsunami Information Statement for Hawaii (WEHW42 PHEB) – Pacific Event

WEHW42 PHEB 021417
TIBHWX

HIZ001>003-005>009-012>014-016>021-023>026-021617-

TSUNAMI INFORMATION STATEMENT NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
417 AM HST MON JUN 02 2008

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

SUBJECT - TSUNAMI INFORMATION

THIS STATEMENT IS FOR INFORMATION ONLY. NO ACTION REQUIRED.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 0415 AM HST 02 JUN 2008
COORDINATES - 38.5 NORTH 143.1 EAST
LOCATION - OFF EAST COAST OF HONSHU JAPAN
MAGNITUDE - 6.7 MOMENT

EVALUATION

BASED ON ALL AVAILABLE DATA A DESTRUCTIVE PACIFIC-WIDE TSUNAMI IS NOT EXPECTED AND THERE IS NO TSUNAMI THREAT TO HAWAII. REPEAT. A DESTRUCTIVE PACIFIC-WIDE TSUNAMI IS NOT EXPECTED AND THERE IS NO TSUNAMI THREAT TO HAWAII.

THIS WILL BE THE ONLY STATEMENT ISSUED FOR THIS EVENT UNLESS ADDITIONAL DATA ARE RECEIVED.

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NNNN

2.5 Urgent Local Tsunami Warning for Hawaii (WEHW40 PHEB)

WEHW40 PHEB 021419
TSUHWX

HIZ023>026-021619-
/O.NEW.PHEB.TS.W.0012.100602T1419Z-000000T0000Z/

BULLETIN - EAS ACTIVATION REQUESTED
TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
419 AM HST MON JUN 02 2010

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

SUBJECT - URGENT LOCAL TSUNAMI WARNING

EFFECTIVE IMMEDIATELY AN URGENT TSUNAMI WARNING IS ISSUED FOR

HAWAII COUNTY

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 0415 AM HST 02 JUN 2010
COORDINATES - 19.3 NORTH 155.2 WEST
LOCATION - IN THE HILINA REGION OF KILAUEA VOLCANO
MAGNITUDE - 7.4

EVALUATION

A DESTRUCTIVE TSUNAMI MAY HAVE BEEN GENERATED BY THIS EARTHQUAKE.
RECOMMEND URGENT ACTION BE TAKEN TO PROTECT LIVES AND PROPERTY.

ADDITIONAL MESSAGES WILL BE ISSUED AS MORE INFORMATION
BECOMES AVAILABLE.

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NNNN

2.6 Public Urgent Local Tsunami Warning for Hawaii (WEHW50 PHEB)

WEHW50 PHEB 021419
TSUHW1

HIZ001>028-021619-
/O.NEW.PHEB.TS.W.0012.100602T1419Z-000000T0000Z/

PUBLIC TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
419 AM HST 02 JUN 2008

...AN URGENT LOCAL TSUNAMI WARNING IS IN EFFECT...

THIS IS AN URGENT TSUNAMI WARNING FROM THE PACIFIC TSUNAMI WARNING CENTER FOR HAWAII COUNTY.

PERSONS IN LOW LYING COASTAL AREAS OF THOSE COUNTIES SHOULD EVACUATE IMMEDIATELY AT LEAST A HALF MILE INLAND OR TO AN ELEVATION AT LEAST 30 FEET ABOVE SEA LEVEL OR TO THE 3RD FLOOR AND ABOVE IN STEEL OR CONCRETE BUILDINGS. DANGEROUS TSUNAMI WAVES MAY ALREADY HAVE ARRIVED OR MAY COME ASHORE WITHIN MINUTES FROM A MAGNITUDE 7.4 EARTHQUAKE THAT OCCURRED AT 415 AM HST IN THE HILINA REGION OF KILAUEA VOLCANO.

THE TSUNAMI HAZARD MAY CONTINUE FOR SEVERAL HOURS OR LONGER. DO NOT RETURN TO EVACUATED COASTAL AREAS UNTIL AN ALL CLEAR FOR OUR AREA IS ISSUED BY CIVIL DEFENSE.

AGAIN...

THIS IS AN URGENT TSUNAMI WARNING FROM THE PACIFIC TSUNAMI WARNING CENTER FOR HAWAII COUNTY.

PERSONS IN LOW LYING COASTAL AREAS OF THOSE COUNTIES SHOULD EVACUATE IMMEDIATELY AT LEAST A HALF MILE INLAND OR TO AN ELEVATION AT LEAST 30 FEET ABOVE SEA LEVEL OR TO THE 3RD FLOOR AND ABOVE IN STEEL OR CONCRETE BUILDINGS. DANGEROUS TSUNAMI WAVES MAY ALREADY HAVE ARRIVED OR MAY COME ASHORE WITHIN MINUTES FROM A MAGNITUDE 7.4 EARTHQUAKE THAT OCCURRED AT 415 AM HST IN THE HILINA REGION OF KILAUEA VOLCANO.

THE TSUNAMI HAZARD MAY CONTINUE FOR SEVERAL HOURS OR LONGER. DO NOT RETURN TO EVACUATED COASTAL AREAS UNTIL AN ALL CLEAR FOR OUR AREA IS ISSUED BY CIVIL DEFENSE.

ADDITIONAL INFORMATION WILL BE ISSUED BY THE PACIFIC TSUNAMI WARNING CENTER AS IT BECOMES AVAILABLE. AFTER YOU HAVE EVACUATED TO A SAFE LOCATION...TUNE TO LOCAL RADIO OR TELEVISION STATIONS FOR FURTHER INSTRUCTIONS.

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NNNN

2.7 Hawaii Tsunami Seismic Information Statement

ZCZC
SEHW70 PHEB 200404
EQIHWX

HIZ001>003-005>009-012>014-016>021-023>026-200604-

TSUNAMI SEISMIC INFORMATION STATEMENT NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
604 PM HST FRI SEP 19 2008

TO - CIVIL DEFENSE IN THE STATE OF HAWAII

SUBJECT - LOCAL TSUNAMI INFORMATION

THIS STATEMENT IS FOR INFORMATION ONLY. NO ACTION REQUIRED.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 0600 PM HST 19 SEP 2008
COORDINATES - 19.3 NORTH 155.1 WEST
LOCATION - ON THE SOUTH FLANK OF KILAUEA VOLCANO
MAGNITUDE - 4.7

EVALUATION

NO TSUNAMI IS EXPECTED. REPEAT. NO TSUNAMI IS EXPECTED.
HOWEVER... SOME AREAS MAY HAVE EXPERIENCED STRONG SHAKING.
THIS WILL BE THE ONLY STATEMENT ISSUED FOR THIS EVENT UNLESS
ADDITIONAL DATA ARE RECEIVED.

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NNNN

2.8 Tsunami Watch for the Indian Ocean (WEIO21 PHEB)

WEIO21 PHEB 021428
TSUIOX

TSUNAMI BULLETIN NUMBER 001
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1428Z 02 JUN 2008

THIS BULLETIN IS FOR ALL AREAS OF THE INDIAN OCEAN.

... A REGIONAL TSUNAMI WATCH IS IN EFFECT ...

A TSUNAMI WATCH IS IN EFFECT FOR

INDONESIA / AUSTRALIA / THAILAND

FOR OTHER AREAS OF THE INDIAN OCEAN REGION... THIS MESSAGE IS
FOR INFORMATION ONLY AT THIS TIME.

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1415Z 02 JUN 2008
COORDINATES - 2.9 SOUTH 99.5 EAST
LOCATION - SOUTHERN SUMATRA INDONESIA
MAGNITUDE - 7.8

EVALUATION

EARTHQUAKES OF THIS SIZE HAVE THE POTENTIAL TO GENERATE A
DESTRUCTIVE LOCAL TSUNAMI AND SOMETIMES A DESTRUCTIVE REGIONAL
TSUNAMI ALONG COASTS LOCATED USUALLY NO MORE THAN A THOUSAND
KILOMETERS FROM THE EARTHQUAKE EPICENTER. AREAS FURTHER FROM THE
EPICENTER COULD EXPERIENCE SMALL SEA LEVEL CHANGES AND STRONG OR
UNUSUAL COASTAL CURRENTS.

HOWEVER - IT IS NOT KNOWN THAT A TSUNAMI WAS GENERATED. THIS
WATCH IS BASED ONLY ON THE EARTHQUAKE EVALUATION. AUTHORITIES IN
THE REGION SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS
POSSIBILITY. THE WATCH WILL NOT EXPAND TO OTHER AREAS OF THE
INDIAN OCEAN UNLESS ADDITIONAL DATA ARE RECEIVED TO WARRANT SUCH
AN EXPANSION.

DUE TO ONLY LIMITED SEA LEVEL DATA FROM THE REGION IT MAY NOT BE
POSSIBLE FOR THIS CENTER TO RAPIDLY CONFIRM NOR EVALUATE THE
THE STRENGTH OF A TSUNAMI IF ONE HAS BEEN GENERATED.

ESTIMATED INITIAL TSUNAMI WAVE 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. A TSUNAMI IS A
SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE TSUNAMI WAVES CAN BE FIVE
MINUTES TO ONE HOUR.

NWSI 10-701 MARCH 28, 2012

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
INDONESIA	SEBERUT	1.5S 98.7E	1436Z 02 JUN
	PADANG	0.9S 100.1E	1448Z 02 JUN
	BENGKULU	3.9S 102.0E	1501Z 02 JUN
	SIMEULUE	2.5N 96.0E	1516Z 02 JUN
	BANDAR LAMPUNG	5.7S 105.3E	1558Z 02 JUN
	BANDA ACEH	5.5N 95.1E	1603Z 02 JUN
	CILACAP	7.8S 108.9E	1617Z 02 JUN
	BELAWAN	3.8N 99.0E	1936Z 02 JUN
AUSTRALIA	CHRISTMASN IS	10.4S 105.4E	1530Z 02 JUN
	COCOS ISLAND	12.1S 96.7E	1535Z 02 JUN
THAILAND	KO TARUTAO	6.6N 99.6E	1859Z 02 JUN

THIS WILL BE THE ONLY BULLETIN ISSUED BY THE PACIFIC TSUNAMI WARNING CENTER FOR THIS EVENT UNLESS ADDITIONAL INFORMATION BECOMES AVAILABLE.

THE JAPAN METEOROLOGICAL AGENCY MAY ISSUE ADDITIONAL INFORMATION FOR THIS EVENT. IN THE CASE OF CONFLICTING INFORMATION...THE MORE CONSERVATIVE INFORMATION SHOULD BE USED FOR SAFETY.

NNNN

2.9 Tsunami Information Bulletin for the Indian Ocean (WEIO23 PHEB)

WEIO23 PHEB 021426
TIBIOX

TSUNAMI BULLETIN NUMBER 001
PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1426Z 02 JUN 2008

THIS BULLETIN IS FOR ALL AREAS OF THE INDIAN OCEAN.

... TSUNAMI INFORMATION BULLETIN ...

THIS MESSAGE IS FOR INFORMATION ONLY.

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1415Z 02 JUN 2008
COORDINATES - 2.9 SOUTH 99.5 EAST
LOCATION - SOUTHERN SUMATRA INDONESIA
MAGNITUDE - 6.8

EVALUATION

A DESTRUCTIVE WIDESPREAD TSUNAMI THREAT DOES NOT EXIST BASED ON HISTORICAL EARTHQUAKE AND TSUNAMI DATA.

HOWEVER - THERE IS A VERY SMALL POSSIBILITY OF A LOCAL TSUNAMI THAT COULD AFFECT COASTS LOCATED USUALLY NO MORE THAN A HUNDRED KILOMETERS FROM THE EARTHQUAKE EPICENTER. AUTHORITIES IN THE REGION NEAR THE EPICENTER SHOULD BE MADE AWARE OF THIS POSSIBILITY.

THIS WILL BE THE ONLY BULLETIN ISSUED BY THE PACIFIC TSUNAMI WARNING CENTER FOR THIS EVENT UNLESS ADDITIONAL INFORMATION BECOMES AVAILABLE.

THE JAPAN METEOROLOGICAL AGENCY MAY ISSUE ADDITIONAL INFORMATION FOR THIS EVENT. IN THE CASE OF CONFLICTING INFORMATION...THE MORE CONSERVATIVE INFORMATION SHOULD BE USED FOR SAFETY.

NNNN

2.10 Tsunami Watch for the Caribbean Sea (WECA41 PHEB)

WECA41 PHEB 021429
TSUCAX

TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1429 UTC MON JUN 02 2008

THIS MESSAGE APPLIES TO ALL COUNTRIES WITHIN AND BORDERING THE
CARIBBEAN SEA...EXCEPT FOR PUERTO RICO AND THE VIRGIN ISLANDS.

... A REGIONAL TSUNAMI WATCH IS IN EFFECT ...

A TSUNAMI WATCH IS IN EFFECT FOR

MONTserrat / GUADELOUPE / ANTIGUA / SAINT KITTS / DOMINICA / MARTINIQUE /
BARBUDA / SAINT LUCIA / SAINT MAARTEN / ST VINCENT / SAINT MARTIN / ANGUILLA /
GRENADA / BARBADOS / TRINIDAD TOBAGO / BONAIRE / DOMINICAN REP / CURACAO /
ARUBA / VENEZUELA / TURKS N CAICOS / HAITI / GUYANA

FOR OTHER AREAS OF THE CARIBBEAN COVERED BY THIS MESSAGE...IT IS FOR
INFORMATION ONLY AT THIS TIME.

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1415Z 02 JUN 2008
COORDINATES - 16.6 NORTH 62.3 WEST
LOCATION - LEEWARD ISLANDS
MAGNITUDE - 7.7

EVALUATION

EARTHQUAKES OF THIS SIZE HAVE THE POTENTIAL TO GENERATE A DESTRUCTIVE
LOCAL TSUNAMI AND SOMETIMES A DESTRUCTIVE REGIONAL TSUNAMI ALONG COASTS
LOCATED USUALLY NO MORE THAN A THOUSAND KILOMETERS FROM THE EARTHQUAKE
EPICENTER. AREAS FURTHER FROM THE EPICENTER COULD EXPERIENCE SMALL SEA
LEVEL CHANGES AND STRONG OR UNUSUAL CURRENTS.

HOWEVER - IT IS NOT KNOWN THAT A TSUNAMI WAS GENERATED. THIS WATCH IS
BASED ONLY ON THE EARTHQUAKE EVALUATION. AUTHORITIES IN THE REGION
SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THE
WATCH WILL NOT EXPAND TO OTHER AREAS OF THE CARIBBEAN UNLESS ADDITIONAL
DATA ARE RECEIVED TO WARRANT SUCH AN EXPANSION.

DUE TO ONLY LIMITED SEA LEVEL DATA FROM THE REGION IT MAY NOT BE POSSIBLE
FOR THIS CENTER TO RAPIDLY CONFIRM NOR EVALUATE THE STRENGTH OF A TSUNAMI
IF ONE HAS BEEN GENERATED.

ESTIMATED INITIAL TSUNAMI WAVE 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. A TSUNAMI IS A SERIES OF WAVES

NWSI 10-701 MARCH 28, 2012

AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES		ARRIVAL TIME
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MONTESERRAT	PLYMOUTH	16.7N	62.2W	1419Z 02 JUN
GUADELOUPE	BASSE-TERRE	16.0N	61.7W	1427Z 02 JUN
ANTIGUA	SAINT JOHNS	17.1N	61.9W	1432Z 02 JUN
SAINT KITTS	BASSETERRE	17.3N	62.7W	1433Z 02 JUN
DOMINICA	ROSEAU	15.3N	61.4W	1437Z 02 JUN
MARTINIQUE	FORT-DE-FRANCE	14.5N	61.2W	1444Z 02 JUN
BARBUDA	PALMETTO POINT	17.6N	61.9W	1446Z 02 JUN
SAINT LUCIA	CASTRIES	14.0N	61.2W	1449Z 02 JUN
SAINT MAARTEN	SIMPSON BAAI	18.0N	63.1W	1455Z 02 JUN
ST VINCENT	KINGSTOWN	13.1N	61.2W	1459Z 02 JUN
SAINT MARTIN	BAIE BLANCHE	18.1N	63.0W	1501Z 02 JUN
ANGUILLA	THE VALLEY	18.3N	63.1W	1506Z 02 JUN
GRENADA	SAINT GEORGES	12.0N	61.8W	1509Z 02 JUN
BARBADOS	BRIDGETOWN	13.1N	59.6W	1517Z 02 JUN
TRINIDAD TOBAGO	PIRATES BAY	11.3N	60.6W	1531Z 02 JUN
	PORT-OF-SPAIN	19.5N	61.5W	1617Z 02 JUN
BONAIRE	ONIMA	12.3N	68.3W	1531Z 02 JUN
DOMINICAN REP	CABO ENGANO	18.6N	68.3W	1532Z 02 JUN
	SANTO DOMINGO	18.2N	70.0W	1541Z 02 JUN
	PUERTO PLATA	20.0N	70.8W	1558Z 02 JUN
CURACAO	WILLEMSTAD	12.1N	68.9W	1539Z 02 JUN
ARUBA	ORANJESTAD	12.5N	70.0W	1550Z 02 JUN
VENEZUELA	MAIQUETIA	10.8N	67.0W	1551Z 02 JUN
	CUMANA	10.5N	64.2W	1602Z 02 JUN
	PORLAMAR	10.9N	63.8W	1616Z 02 JUN
	PUNTO FIJO	11.7N	70.2W	1645Z 02 JUN
	GOLFO VENEZUELA	11.4N	71.2W	1723Z 02 JUN
TURKS N CAICOS	GRAND TURK	21.5N	71.1W	1604Z 02 JUN
HAITI	CAP-HAITEN	19.8N	72.0W	1620Z 02 JUN
	PORT-AU-PRINCE	18.8N	72.5W	1703Z 02 JUN
GUYANA	GEORGETOWN	7.0N	58.2W	1904Z 02 JUN

THE PACIFIC TSUNAMI WARNING CENTER WILL CONTINUE TO MONITOR THE SITUATION. FUTURE MESSAGES WILL BE ISSUED AT LEAST ONCE AN HOUR TO PROVIDE SEA LEVEL READINGS OR OTHER REPORTS OF TSUNAMI WAVE ACTIVITY OR TO FURTHER EVALUATE THE SITUATION UNTIL THE THREAT HAS PASSED.

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2.11 Tsunami Information Statement for the Caribbean Sea (WECA43 PHEB)

WECA43 PHEB 021425
TIBCAX

TSUNAMI INFORMATION STATEMENT NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1425 UTC MON JUN 02 2008

THIS STATEMENT APPLIES TO ALL COUNTRIES WITHIN AND BORDERING THE
CARIBBEAN SEA...EXCEPT FOR PUERTO RICO AND THE VIRGIN ISLANDS.

... TSUNAMI INFORMATION STATEMENT...

THIS MESSAGE IS FOR INFORMATION ONLY

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1415Z 02 JUN 2008
COORDINATES - 16.6 NORTH 62.3 WEST
LOCATION - LEEWARD ISLANDS
MAGNITUDE - 6.3

EVALUATION

A DESTRUCTIVE WIDESPREAD TSUNAMI THREAT DOES NOT EXIST BASED ON HISTORICAL
EARTHQUAKE AND TSUNAMI DATA.

HOWEVER - THERE IS THE SMALL POSSIBILITY OF A LOCAL TSUNAMI THAT COULD EFFECT
COASTS LOCATED USUALLY NO MORE THAN A HUNDRED KILOMETERS FROM THE EARTHQUAKE
EPICENTER. AUTHORITIES IN THE REGION NEAR THE EPICENTER SHOULD BE MADE AWARE
OF THIS POSSIBILITY.

THIS WILL BE THE ONLY PRODUCT ISSUED BY THE PACIFIC TSUNAMI WARNING CENTER FOR
THIS EVENT UNLESS ADDITIONAL INFORMATION BECOMES AVAILABLE.

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APPENDIX B - Glossary of Terms

Earthquake Magnitude. A logarithmic scale for indicating the size of earthquakes. For tsunami warning purposes the moment magnitude scale (based on seismic P waves, surface waves, or both) will be used to size potentially tsunamigenic earthquakes. Other magnitude scales such as Ms, mb, and ml can be used as appropriate to size smaller non-tsunamigenic earthquakes and as a supplement to the moment magnitude scale for larger earthquakes.

Tsunami Amplitude. Usually measured on a sea level gage, it is the deviation of sea level caused by the tsunami that is above or below the normal tidal level. Tsunami amplitudes reported by TWCs in their operational products usually represent maximum amplitudes observed so far. Reported values may change as new data are received.

Tsunami Warning System. The collection of resources, processes, and functions that ensure tsunami warnings are issued, disseminated, and acted upon to save lives and otherwise mitigate the hazard. The system includes observational data (e.g. seismic, tide/sea-level), monitoring, communications and dissemination capabilities, products and services, and the human expertise at each point in the system. Warning systems may exist at local, national, international and global levels. A particular system has a governance body to oversee and ensure the proper working condition of the warning system.

APPENDIX C – Acronyms

AKWAS	Alaska Warning System
AFTN	Aeronautical Fixed Telecommunications System
AOR	Area of Responsibility
AWIPS	Advanced Weather Interactive Processing System
CAP	Common Alerting Protocol
CARIBE-EWS	Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions
CWA	County Warning Area
EAS	Emergency Alert System
EIDS	Earthquake Information Dissemination System
EMWIN	Emergency Managers Weather Information Network
ETN	Event Tracking Number
FAA	Federal Aviation Administration
GTS	Global Telecommunications System
HAWAS	Hawaii Warning System
ICG	Intergovernmental Coordinating Group
IDN	Inter-island Data Network
IOC	Intergovernmental Oceanographic Commission
IOTWS	Indian Ocean Tsunami Warning and Mitigation System
ITIC	International Tsunami Information Center
JMA	Japan Meteorological Administration
MND	Mass News Disseminator
NADIN2	National Airspace Data Interchange Network
NAWAS	National Warning System
NEIC	National Earthquake Information Center
NOAA	National Oceanic and Atmospheric Administration
NTHMP	National Tsunami Hazard Mitigation Program
NWPTAC	Northwest Pacific Tsunami Advisory Center
NWR	NOAA Weather Radio
NWS	National Weather Service
NWSI	National Weather Service Instruction
NWWS	NOAA Weather Wire System
PTWC	Pacific Tsunami Warning Center
PTWS	Pacific Tsunami Warning and Mitigation System
RSS	Really Simple Syndication
SMS	Short Messaging Service
SPS	Special Weather Statement
TSR	Tsunami Source Region
TWC	Tsunami Warning Center
TWS	Tsunami Warning System
UGC	Universal Geographic Code
UNESCO	United Nations Educational, Scientific, and Cultural Organization

USGS	United States Geological Survey
VTEC	Valid Time Event Code
WC/ATWC	West Coast/Alaska Tsunami Warning Center
WCS	Warning Coordination Subcommittee
WFO	Weather Forecast Office
WMO	World Meteorological Organization
XML	Extensible Markup Language