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***SOUTHERN REGION TSUNAMI WARNING PROGRAM OPERATIONS FOR WFO  
SAN JUAN AND THE SOUTHEAST RIVER FORECAST CENTER***

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1. Updated tsunami warning and advisory criteria for Puerto Rico and the Virgin Islands.
2. Updated the graphic in Appendix G

<signed>

August 25, 2014

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Steven Cooper,  
Acting Regional Director

Date

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## **1. Introduction**

This Regional Supplement describes responsibilities and provides guidance to the National Weather Service (NWS) San Juan, Puerto Rico (PR) Forecast Office (SJU) and the Southeast River Forecast Center (SERFC). Detailed procedures regarding the Southern Region (SR) continental United States (CONUS) coastal Weather Forecast Offices (WFO) and River Forecast Centers (RFC) with coastal responsibility along the Gulf of Mexico and Atlantic Ocean are contained in a [separate supplement](#).

If a seismic event occurs in the Atlantic and meets the seismic magnitude and location criteria listed in Sections 6.2 and 6.3, the National Tsunami Warning Center (NTWC) in Alaska will issue Tsunami Warnings, Advisories, Watches, or Informational products for Puerto Rico and the U.S. Virgin Islands (USVI) and British Virgin Islands (BVI). WFO SJU broadcasts this information on NOAA Weather Radio All Hazards (NWR). Updates are provided by WFO SJU and the SERFC to local customers and partners during and after events.

## **2. Tsunami Warning Program Overview**

### **2.1 Caribbean Tsunami Warning Program**

The NWS Caribbean Tsunami Warning Program in Mayagüez, PR has responsibility for the regional policy and operational program leadership and improvements in all tsunami program aspects: information, alerts, communications, and preparedness activities for the U.S. western Atlantic coastal areas within the Caribbean and the Gulf of Mexico. Toward that end, the office currently provides support and guidance for tsunami observations, including seismic and sea level systems, tsunami forecasting, communications, and education and preparedness. It works closely with the Pacific Tsunami Warning Center (PTWC) and the NTWC, which are currently providing interim tsunami warning and guidance for the international and domestic coastal areas along the western Atlantic basin.

### **2.2 Weather Forecast Office San Juan**

WFO San Juan is responsible for planning and taking appropriate action when there is a threat of a tsunami for their area, including dissemination of Tsunami Warnings, Advisories and Watches. They are also responsible for ensuring the readiness of office staff and systems through routine operational drills, coordinating community outreach activities to increase tsunami hazard awareness, and assisting in emergency preparedness for tsunami events (e.g., promotion of the TsunamiReady program) in coordination with the leadership of the NWS Caribbean Tsunami Warning Program (CTWP). Emergency Management Agencies in Puerto Rico and the USVI have the responsibility for developing warning procedures and emergency plans (along with help from WFO SJU

and the SERFC), and for making evacuation decisions for local communities. Specific (localized) procedures will be included in the WFO Station Duty Manual (SDM).

### 2.3 Southeast River Forecast Center

The SERFC is responsible for preparing main stem river and flood forecast guidance for appropriate locations near the coastal areas that may be affected by tsunamis.

### 2.4 Puerto Rico Seismic Network

The Puerto Rico Seismic Network (PRSN) also monitors the Atlantic basin, Caribbean, and Gulf of Mexico for seismic events. PRSN contacts WFO San Juan and emergency officials of PR and the USVI and relays tsunami/earthquake information for seismic events per the criteria in Section 6 via phone calls to WFO San Juan, BVI police department, BVI Department of Disaster Management, USVI 911, Virgin Islands Territorial Emergency Management Agency (VITEMA), and the Puerto Rico Emergency Management Agency (PREMA). The PRSN also disseminates its culturally appropriate earthquake and tsunami products via email, social media, text messages, and the web. PRSN is part of the Department of Geology of the University of Puerto Rico in Mayagüez, Puerto Rico.

### 2.5 National Tsunami Warning Center

The NTWC provides interim services until further notice for potential tsunami-genic events which may affect the U.S. coastline areas of the western Atlantic basin including the Caribbean and Gulf of Mexico, and the British Virgin Islands and Canada.

### 2.6 Pacific Tsunami Warning Center

The Pacific Tsunami Warning Center is the backup for the NTWC. The PTWC provides interim tsunami warning services to the greater Caribbean, Gulf and Western Atlantic, not covered by the NTWC, but part of the UNESCO Intergovernmental Coordination Group for Tsunamis and other Coastal Hazards for the Caribbean and Adjacent Regions.

## 3. Tsunami Program Procedures

The PRSN and NTWC monitor the Atlantic basin, Caribbean, and Gulf of Mexico for tsunami-genic events. If a seismic event occurs in these areas and meets the seismic magnitude and location criteria listed in Section 6, PRSN will contact WFO San Juan and emergency officials of PR and the USVI concerning the seismic events. The NTWC, following the same criteria, will issue the corresponding product discussed in Section 6. WFO SJU broadcasts this information on NWR and issues the EAS with subsequent updates provided by WFO SJU and the SERFC to local customers and partners during and after the event.

#### 4. **NTWC Products**

The products that NTWC issue (and PTWC as backup) are detailed below.

##### 4.1 **Tsunami Product Definitions (applying to CTWP, PRSN, PTWC, NTWC)**

- a. **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.
- b. **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.
- c. **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.
- d. **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, advisory, or watch 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 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 warning, advisory, or watch may be issued for the area, if necessary, after analysis and/or updated information becomes available.

## 4.2 Tsunami Text Products

### 4.2.1 Warnings, Advisories, Watches and Cancellation Messages

NTWC issues Tsunami Warnings, Tsunami Advisories, Tsunami Watches, updates, and cancellation messages under these two World Meteorological Organization (WMO) headings and AWIPS identifiers:

WEXX20 PAAQ ANCT**TSU**AT1 – Segmented format product  
WEXX30 PAAQ ANCT**TSU**ATE – Public product

Where, TSU = Tsunami Warning, Advisory, Watch, or Cancellation product

(See Table 1 and Table 2 in Section 6 for the criteria of Tsunami Warnings, Advisories, and Watches.)

The TSUATE product is bulleted and referred to as “public” and is issued during warning/advisory/watch events. See Appendix F for example. TSUAT1 is a segmented product which contains VTEC and UGCs. The text is intended for text-to-speech applications.

The NTWC will collect and analyze data, as well as issue follow-up statements every 30 to 60 minutes under TSUAT1 and TSUATE during the first two hours after an event. Later in the event, the time between issuance may increase, but will not exceed two hours. If a tsunami is no longer expected or the danger has passed, the NTWC will issue a cancellation message under the same product ID.

### 4.2.2 Tsunami Information Statements

A Tsunami Information Statement (TIB) usually is issued when the magnitude of a seismic event is above 6.0 but below warning/advisory/watch criteria. The TIB is also based on location of a seismic event – see Sections 6.2 and 6.3 for specifics. It provides pertinent information about earthquakes in the region (particularly those which may have been felt near the coast or were strong enough to attract media attention). The WMO heading and AWIPS identifier for Tsunami Information Statements is:

WEXX32 PAAQ ANCT**TIB**ATE

Where, TIB = Tsunami Information Statement

There are no mandatory follow-up messages for the TIB products.

#### 4.2.3 Tsunami Seismic Information Statement

A Tsunami Seismic Information Statement (EQI) is issued to provide pertinent information about earthquakes in the region, usually when the magnitude of a seismic event is below 6.0 but above 4.0 (location dependent – See Sections 6.2 and 6.3). The WMO heading and AWIPS identifier for the Tsunami Seismic Information Statement is:

SEXX60 PAAQ ANCEQIAT1

Where, EQI = Tsunami Seismic Information Statement

There are no mandatory follow up messages for the EQI product.

### 5. NTWC Dissemination

The NTWC will relay the TSU, TIB, and EQI tsunami products for the Atlantic basin, Caribbean, and Gulf of Mexico by means of (reference Section 2.7 in [NWSI 10-701](#)):

- Broadcast over National Warning System (NAWAS),
- Dissemination via National Airspace Data Interchange Network (NADIN2), NOAA Weather Wire Service (NWWS), Lines 276 and 277 to NWS Telecommunications Gateway (NWS Circuit, EMWIN, and AWIPS feed), email, digital pagers, Earthquake Information Distribution System (EIDS), RSS feeds, CAP v1.2 feeds, and the NTWC web site,
- Telephone contact with the Puerto Rico Seismic Network (PRSN),
- Telephone contact with the National Earthquake Information Center (NEIC),
- Telephone contact with the U. S. State Department Operations Center when appropriate, and
- Telephone contact to PR EMA, VI EMA, and British VI for Caribbean events.

### 6. Procedural Thresholds

If an earthquake is detected in the Atlantic basin, Caribbean, and/or Gulf of Mexico, the NTWC will issue a Tsunami Warning, Tsunami Advisory, Tsunami Watch, or Information Statement using the thresholds in Sections 6.2 and 6.3. Table 1 and Table 2 depict the criteria for the issuance of tsunami-related products.

#### 6.1 Break Points

In the tsunami warning/advisory/watch/ product, breakpoints along the CONUS coasts are used to define the areal extent. For Puerto Rico and the USVI, the tsunami products will not contain break points for the islands. Instead, the islands will be listed in the products that will be contained in a Warning, Advisory, or Watch.

6.2 Criteria for Events Near U.S. Commonwealth of Puerto Rico and the U.S. Virgin Islands

The ‘PR and USVI Area’ is defined as the area from 17N to 21N and from 63.5W to 68.25W. See Appendix G for a graphical representation of these criteria and the NTWC Area of Responsibility (AOR).

**Table 1:  
Determination of Product to be Issued by Earthquake Magnitude and Area of Occurrence**

Magnitude	Area	Product	Product ID
4.0 - 4.9	PR and USVI area	Tsunami Seismic_Information Statement	ANCEQIAT1
5.0 - 5.9	PR and USVI area	Tsunami Seismic_Information Statement	ANCEQIAT1
6.0 - 6.4	PR and USVI area	Tsunami Information Statement	ANCTIBATE
> 6.0 and deeper than 100km	PR and USVI area	Tsunami Information Statement	ANCTIBATE
6.5 – 7.0	PR and USVI area	Tsunami Advisory for PR/VI	ANCTSUAT1 and ANCTSUATE
>= 7.1	PR and USVI area	Tsunami Warning for PR/VI	ANCTSUAT1 and ANCTSUATE

Note: ‘PR and USVI Area’ is defined as the area from 17N to 21N and from 63.5W to 68.25W.

*Once tsunami height forecasts are refined with observations, those areas with forecasts in the range 0.3m to 1.0m are placed in Advisory status and those greater than 1.0m in Warning Status. If forecasts are below 0.3m, the Warnings, Advisories, and Watches are canceled. Note that tsunami forecasts may vary greatly along a coast. Broad areas are grouped into the appropriate level of alert.*

6.3 Criteria for the Caribbean Region and the Western Atlantic Region

**Table 2:  
Determination of Product to be Issued by Earthquake Magnitude and Area of Occurrence**

Magnitude	Area	Product	Product
6.0-7.5 >= 6.0 and deeper than 100 km or inland	Caribbean	Tsunami Information Statement	ANCTIBATE

7.6 – 7.8	Eastern Caribbean	Tsunami Advisory for PR/VI	ANCTSUAAT1 and ANCTSUAATE
7.6 – 7.8	Western Caribbean	Tsunami Information Statement	ANCTIBATE
> 7.9	Eastern Caribbean	Tsunami Warning for PR/VI	ANCTSUAAT1 and ANCTSUAATE
>7.9	Western Caribbean	Tsunami Advisory for PR/VI	ANCTSUAAT1 and ANCTSUAATE
> 6.4	Atlantic basin (No potential danger to Area of Responsibility)	No Danger	ANCTIBATE
> 7.5	Atlantic basin (Potential danger to Area of Responsibility)	Estimated time of arrival dependent: Potential danger	ANCTIBATE or (ANCTSUAAT1 and ANCTSUAATE)

Note: ‘Eastern Caribbean’ and ‘Western Caribbean’ are separated at 75W.

## 7. **WFO Procedures**

WFO San Juan will follow the procedures below if they are in the affected area of a Tsunami Warning, Advisory, or Watch. Critical actions by WFO SJU are necessary for public and partner notification. A checklist to be utilized during a tsunami event is provided in Appendix A.

## 8. **WFO Communication and Dissemination**

### 8.1 **WFO Communication**

1. **Advanced Weather Interactive Processing System (AWIPS)**  
Both the SERFC and WFO SJU *must* ensure all of the products listed in Sections 4.2.1, 4.2.2, and 4.2.3 are *alarmed* in AWIPS. In addition, both offices must ensure after each AWIPS build (or crash) that the products are reconfigured to be alarmed.
2. **Contact Logs**  
WFO SJU will likely receive numerous calls from the media, public, emergency managers, etc. during earthquake and tsunami events. Ensure that all calls initiated or received, as well as subsequent actions are logged.
3. **Emergency Phones**  
Emergency office cellular and/or satellite phones should be charged and easily

accessible to all staff. In addition, staff must know exactly where emergency cellular and/or satellite phones are and how to use them.

## 8.2 NOAA Weather Radio All Hazards (NWR) and EAS Activation

### 8.2.1. When a Tsunami Warning Advisory or Watch is Issued:

1. Activate NWR. When a Tsunami Warning, Advisory, or Watch has been issued by the NTWC for the WFO SJU County Warning Area (CWA), the office will:
  - a. ***Immediately*** activate the Emergency Alert System (EAS),
  - b. Tone alert (both 1050HZ and SAME [Specific Area Message Encoding]) the NWR Console Replacement System (CRS) for all affected NWR coastal transmitters, and
  - c. Broadcast the tsunami information on NWR.

Sample broadcast templates are provided in Appendix B (for a Tsunami Watch) or Appendix C (for a Tsunami Warning) or Appendix D (for a Tsunami Advisory). Use information in the TSUATE product to fill in the appropriate template and then use it as a broadcast script.

**Note:** *Only tone alert via NWR* the proper EAS codes on NWR and read from the broadcast template script (located in Appendix B, C, and D). Specifically, do ***not*** issue a Tsunami Warning message (TSW) or Tsunami Watch message (TSA) product from AWIPS (they do not exist in AWIPS, only as EAS codes in NWR).

2. Issue EAS Codes Via NWR. Use the following EAS codes for tsunami EAS dissemination on CRS:
  - Use TSW for Tsunami Warning messages,
  - Use TSA for Tsunami Advisory messages, and
  - Use TSA for Tsunami Watch messages.

Note in your Station Duty Manual (SDM) these EAS codes and also note which transmitters should be activated for tsunami information.

When a Tsunami Advisory is issued, use the TSA code on NWR and manually state it is for a Tsunami Advisory (because the default of the TSA is for a Tsunami Watch). A Tsunami Advisory EAS code has yet to be developed and approved, so use the TSA EAS code in the meantime.

3. If NWR is Off the Air.  
If NWR is off the air (or out of service), contact the Principle Entry Point (PEP) station and tell them to EAS activate for the appropriate product above (Tsunami

Warning, Advisory or Watch). Note in your SDM where all the PEP information is located in your office.

4. Issue Special Weather Statements for Updates.

If a Tsunami Warning, Tsunami Advisory, and/or Tsunami Watch is issued by NTWC for any part of the CWA, WFO San Juan should issue Special Weather Statements (SPS) at intervals between the NTWC products. Issue the SPS products via AWIPS and broadcast over NWR. Similar to Hurricane Local Statements, these SPS issuances are intended to provide timely updates to customers and partners while the Tsunami Warning/Advisory/Watch is in effect and NTWC collects, reviews, and diagnoses data (see Appendix F, Page F-7 for examples). In most cases, the SPS will reemphasize the information in the NTWC products while adding additional local impact information such as flooding and any messages relayed by emergency managers or the Caribbean Tsunami Warning Program, if available. When a Tsunami Warning, Advisory, or Watch is cancelled, use the SPS to relay this information. Broadcast the SPS on NWR.

8.2.2 When a Tsunami Information Statement (TIB) is Issued:

If a TIB is issued for an earthquake that has occurred OUTSIDE the vicinity of the PR/USVI, then the earthquake would likely not be felt and therefore the TIB should not be read on NWR.

However, if a TIB is issued for an earthquake WITHIN the PR/VI AOR or that IS felt by PR/USVI residents, then WFO SJU should read the TIB on NWR, especially because earthquakes of this size that are felt may result in an increase in the number of phone calls or activities at an office. Further, at forecaster discretion, a Special Weather Statement (SPS) product should be issued from AWIPS and/or disseminated on NWR to help minimize media/public concerns. Restate the information from the TIB product, specifically:

*“According to (PRSN, NTWC, USGS), an earthquake occurred at {lat/long/depth-distance from a certain location} at \_\_\_\_\_ (AM / PM).The earthquake has been reported as felt in \_\_\_\_\_(location).*

*Based on location and magnitude 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. Some of these areas may experience non-damaging sea level changes.*

See Appendix F on page F-4 and F-5 for TIB example products.

8.2.3. When a Tsunami Seismic Information Statement (EQI) is Issued:

If the NTWC issues an EQI product for the SJU CWA, a tsunami is unlikely.

EQI products are normally NOT disseminated over NWR, unless forecaster discretion indicates that an NWR announcement and Special Weather Statement (SPS) are necessary to alleviate public concern over tsunami danger. The earthquake may have been felt strongly enough in some locations across the PR and/or VI to cause an increase in phone calls or local activity, even though the magnitude is less than 6.0. Use the following wording in the SPS:

*“According to (PRSN, NTWC, USGS), a light/moderate earthquake occurred at {lat/long/depth-distance from a certain location} at \_\_\_\_\_ (AM / PM).The earthquake has been reported as felt in \_\_\_\_\_ (location).*

*Given the size and location of the earthquake there is NO tsunami threat for Puerto Rico and the Virgin Islands.*

*Continue to monitor your favorite news source for more information. Updated information will be issued by emergency officials and the Puerto Rico Seismic Network.”*

8.2.4 When the Tsunami Warning, Advisory, or Watch is Cancelled:

If the NTWC cancels the Tsunami Warning, Advisory, or Watch, broadcast the information on NWR using the template in Appendix E. Additionally, a Cancellation Checklist is provided on page A-2 that lists tasks to be completed when a Tsunami Warning, Advisory, or Watch has been cancelled.

San Juan’s local policy to tone alert NWR cancellation messages must be collaborated with local partners. Note in your SDM if your office will tone alert NWR for cancelled Tsunami Warning, Advisory, or Watch products. As a reminder, use the SPS to relay information that a Tsunami Warning, Advisory, or Watch was cancelled. Broadcast the SPS on NWR.

9. **Felt Earthquakes**

An SPS may be issued for earthquakes that are felt across the CWA to inform the public about the potential of a tsunami. The SPS can reemphasize the information in the TIB or EQI product, if the product has been received.

There are three types of scenarios:

1. For felt earthquakes where information has been received from PRSN or NTWC. In this case, issue an SPS as appropriate as described in Section 8.2.1.4.
2. For strong\* earthquakes and no information has been received from PRSN or NTWC, and contact cannot be made with either Center. In this case, follow Section 9.1 below. And,
3. Light to moderate\*\* earthquakes and no information has been received from PRSN or NTWC, and contact cannot be made with either Center. Follow procedures listed in Section 9.2 below.

\* For purposes of this Instruction, strong earthquakes are defined as those that produce intense tremors lasting 20 seconds or more.

\*\* For purposes of this Instruction, light/moderate earthquakes are defined as those that produce tremors lightly or moderately for less than 20 seconds.

#### 9.1 SPS for Strong Earthquakes

An SPS should be utilized after strong earthquakes to pass on information to the public about earthquakes and potential tsunamis during the time WFO SJU is waiting to receive Tsunami messages from the PRSN and/or NTWC. Prior to issuing an SPS which contains information that a tsunami may have been generated based on strong shaking felt at the WFO, WFO SJU should attempt to contact the PRSN and NTWC. If contact is made, information on potential tsunami danger should be that provided by the PRSN or NTWC. If contact cannot be made, the WFO should continue as described below.

SPS products can be issued for strong, felt earthquakes for several reasons: (1) the earthquake is so strong that communication lines are down and WFO SJU may not hear from PRSN or NTWC; (2) WFO SJU has not yet heard from PRSN or NTWC but the earthquake is strong enough that a tsunami may be imminent and the SPS can alert the public a tsunami is possible; and (3) strong earthquakes can create numerous media and public inquiries and therefore issuing an SPS before tsunami messages are received from NTWC may be prudent. In the SPS product, the forecaster may wish to use the following examples to express that a tsunami may be produced from strong earthquakes, but no notification has been received yet:

1. Example 1: SPS Wording for Strong Earthquake

A Strong Earthquake was felt in Puerto Rico (and/or the Virgin Islands) at about \_\_\_\_\_ (AM / PM). The exact location and magnitude are unknown at this time.

Anyone in low lying coastal areas should move immediately inland or to high ground due to the possibility of a tsunami. A tsunami can present itself as a rise or fall of sea level along the coast. A tsunami is a series of waves which could be dangerous for several hours after the initial wave arrives.

Continue to monitor NOAA Weather Radio, or your favorite news source for more information. Updated information will be issued later by emergency management officials, the Puerto Rico Seismic Network, the National Tsunami Warning Center, and/or WFO San Juan.

2. Example 2: SPS Wording for Strong Earthquake.

A strong earthquake was felt in Puerto Rico (and/or the Virgin Islands) at about \_\_\_\_\_ (AM / PM). The location and magnitude are unknown at this time but {scattered, widespread, considerable} damage {falling objects, cracked buildings, collapsed structures, etc.} has been reported.

Anyone in low lying coastal areas should move immediately inland or to high ground due to the possibility of a tsunami. A tsunami can present itself as a noticeable rise or fall of sea level along the coast. A tsunami is a series of waves which could be dangerous for several hours after the initial wave arrives.

Continue to monitor NOAA Weather Radio, or your favorite news source for more information. Updated information will be issued later by emergency officials, the Puerto Rico Seismic Network, the National Tsunami Warning Center, and/or WFO San Juan.

Consider creating templates in AWIPS for quick editing of these SPS examples.

9.2 SPS for Light/Moderate Earthquakes.

The SPS can be utilized after a light/moderate earthquake which is felt widely by the population and has generated numerous media and public inquiries, but information neither has been received from the PRSN or NTWC, nor has contact been made with any center. In this case, the public would be informed that there is NO tsunami threat. In the SPS product, the forecaster may use the following wording to express that there is NO tsunami threat from the earthquake

1. Example: SPS Wording for Light/Moderate Earthquakes.

An earthquake occurred at \_\_\_\_\_ (AM / PM). The earthquake has been reported as felt lightly/moderately in \_\_\_\_\_ (location).

Given the reported intensity of the earthquake it is believed there is NO tsunami threat for Puerto Rico and the Virgin Islands.

Continue to monitor your favorite news source for more information. Updated information will be issued by emergency officials and the Puerto Rico Seismic Network.

Consider creating templates in AWIPS for quick editing of these SPS examples.

### 9.3 Earthquake Reports

Anytime an earthquake is felt, WFO SJU may issue an Earthquake Report (EQR) if time is available (see Directive 10-518, Section 4 for details on the EQR).

The WFO (and the public) may inform the National Earthquake Information Center (NEIC), the United States Geological Survey (USGS), and the Puerto Rico Seismic Network of a felt earthquake by filling out their "Did You Feel It" earthquake report form online at:

<http://earthquake.usgs.gov/eqcenter/dyfi/> or <http://prsn.uprm.edu>

## 10. Dissemination Tests for WFO SJU and the SERFC

Monthly dissemination tests will be conducted for tsunami products by NTWC to ensure products are received by the NWS and its partners. NTWC will disseminate a test TSU product once a month to WFOs, RFCs, the FAA, and Federal and State emergency managers.

After receipt of the NTWC tsunami test product(s) [TSUAT1 and/or TSUATE], WFO SJU and the SERFC will respond immediately by disseminating a Tsunami Acknowledgement Message (TMA) from AWIPS, as specified below. The TMA product is received back at NTWC to validate operation of the communication system.

Because some customers can receive the TMA, it is important to add "**THIS IS A ONLY TEST**" to the body of the product.

### **Example of a TMA message sent to NTWC:**

SECA42 TJSJ 231410  
TMASJU

**This is only a test.** (add)

WEXX20 PAAQ RCVD AT **231305**

(this is the time you received the product, not the time this test message is transmitted)

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**Important Note:** The TMA product is NOT to be sent during actual events. It is only disseminated during monthly tests.

**11. Procedures Used to Notify Southern Region Headquarters and the SERFC**

1. To Southern Region Headquarters (SRH) from WFO San Juan.  
Anytime the NTWC issues a Tsunami Warning, Advisory, or Watch for the area or an earthquake of intensity 5.0 or greater is felt, WFO San Juan will notify SRH by calling the Southern Region Regional Operations Center (ROC) at 817-978-1100, ext 147. Leave a message if no one answers and an SRH employee will be paged.

If WFO San Juan is down, WFO Miami will call SRH.

2. To Southeast River Forecast Center (SERFC) from WFO San Juan.  
The WFO San Juan will notify the SERFC when a Tsunami Warning, Advisory, or Watch has been issued for Puerto Rico and the U.S. Virgin Islands. If an event occurs after normal business hours, the Hydrologist-In-Charge (HIC), Development and Operations Hydrologist (DOH), and Service Coordination Hydrologist (SCH) should be contacted at home. If they cannot be contacted, the after-hours contact list should be used until someone is contacted.

If communications at WFO San Juan are inoperative, WFO Miami will call the SERFC.

**12. Drills**

Because earthquakes do not occur regularly, completion of drills are critical to maintaining operational proficiency. WFO SJU will conduct at least one annual drill related to tsunami program procedures and will notify the SRH Tsunami Program Leader when the drill is completed by the staff members.

SRH will keep a record of the annual drills each office conducts. MICs are to send an email to notify the Chief of MSB after each drill.

**Appendix A:**

**Sample WFO Checklist to use when a Tsunami Warning, Advisory, or Watch is issued by NTWC for Your Area.**

**TSUNAMI WARNING / ADVISORY / WATCH**  
(circle one)

Criteria: By direction of the National Tsunami Warning Center

Issued: Date \_\_\_\_\_ Time \_\_\_\_\_

Valid until: Date \_\_\_\_\_ Time \_\_\_\_\_

Initials of Warning Coordinator \_\_\_\_\_

Area Affected \_\_\_\_\_

**Time  
Completed/Initials**

**WARNING/ADVISORY/ WATCH CHECKLIST**

\_\_\_\_\_/\_\_\_\_\_

**Put the warning, advisory, or watch information immediately on NWR as follows:**

- Get a CRS/NWR Broadcast Template from Appendix B (for a Tsunami Watch) or Appendix C (for a Tsunami Warning) or Appendix D (for a Tsunami Advisory).
- Fill in the blanks on the template. That is what you will read on CRS.
- Use the following EAS code \_\_\_\_\_ (defined locally in your SDM)
- Follow the proper procedures to broadcast the message for CRS.
- Write on the template the time your message was initially broadcast on NWR.

\_\_\_\_\_/\_\_\_\_\_

If other weather warnings are in effect during the tsunami event, after a short period of time that the tsunami message has played alone, play the additional warning messages in the interest of protecting lives and property. Keep CRS programming at an absolute minimum. This should all be programmed to happen automatically if you recorded the message correctly on CRS.

\_\_\_\_\_/\_\_\_\_\_

Issue an SPS product every 30 minutes and broadcast on NWR. The SPS product should provide updates and/or local information (see Section 8.2.1.4 for details).

\_\_\_\_\_/\_\_\_\_\_

Consider any additional actions that may enhance community response to this watch/warning. These may include additional phone calls to local emergency managers, law enforcement, fire departments, etc., where impact may be particularly damaging. Record all of these actions.

- \_\_\_\_\_/\_\_\_\_\_  
Continue to record updates from the PRSN and NTWC to CRS as well as SPS products issued from your local office.
- \_\_\_\_\_/\_\_\_\_\_  
Log all additional incidents or actions that pertain to this event. Any verification information received should be recorded as well.
- \_\_\_\_\_/\_\_\_\_\_  
Contact the MIC and WCM if they are not on station.
- \_\_\_\_\_/\_\_\_\_\_  
Contact the SRH ROC by calling 817-978-1100, ext. 147.
- \_\_\_\_\_/\_\_\_\_\_  
Contact PREMA.
- \_\_\_\_\_/\_\_\_\_\_  
Contact VITEMA.
- \_\_\_\_\_/\_\_\_\_\_  
Contact the SERFC.
- \_\_\_\_\_/\_\_\_\_\_  
Contact USGS.

**Time  
Completed**

**CANCELLATION CHECKLIST**

- \_\_\_\_\_/\_\_\_\_\_  
Put the cancellation on NWR as follows:
  - Get a Cancellation Broadcast Template from Appendix E.
  - Fill in the blanks. This is what you will read on CRS.
  - Follow the proper procedures to broadcast the message for CRS.
  - Write the time your cancellation message was initially broadcast on the template.
  - Remove the message after about 1 hour.
- \_\_\_\_\_/\_\_\_\_\_  
Retain all records of this event and distribute to the WCM.
- \_\_\_\_\_/\_\_\_\_\_  
Notify the MIC or the WCM if they are not on station.
- \_\_\_\_\_/\_\_\_\_\_  
Contact the Manager of the Caribbean Tsunami Warning Program (CTWP) in Mayaguez, PR by calling 787-249-8307 or 787-832-4040 ext. 5787
- \_\_\_\_\_/\_\_\_\_\_  
Contact the SERFC.
- \_\_\_\_\_/\_\_\_\_\_  
Contact USGS.
- \_\_\_\_\_/\_\_\_\_\_  
Contact PREMA.
- \_\_\_\_\_/\_\_\_\_\_  
Contact VITEMA.
- \_\_\_\_\_/\_\_\_\_\_  
Gather pertinent documents and review evacuation/safety procedures if the office is threatened by the tsunami.
- \_\_\_\_\_/\_\_\_\_\_  
Log all additional incidents or actions that pertain to this event. Any verification information received should be recorded as well.

**Appendix B:**

**CRS/NWR Broadcast Template for Tsunami Watch**

Upon receipt of a **Tsunami Watch** product (TSUATE) from the NTWC that includes all or a portion of your area, print this form and fill it out based on information included in the Tsunami Watch product. Use the proper procedures to get the message below disseminated via CRS/NWR. Be sure to select the appropriate coastal transmitters that the Tsunami Watch will play on. Attach this form to the Tsunami Watch checklist. Here is the message to fill out and read:

**"The National Weather Service has issued a TSUNAMI WATCH for coastal areas in Puerto Rico and the Virgin Islands at \_\_\_\_\_ AM / PM AST. A large earthquake, with a preliminary magnitude of \_\_\_\_\_, has been detected approximately \_\_\_\_\_ miles \_\_\_\_\_ (direction) of \_\_\_\_\_ (location).**

**Though it remains uncertain if a tsunami will impact the TSUNAMI WATCH area, the arrival times for the initial tsunami wave are estimated for the following locations:**

\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.

---

**Include the following italicized section if this information appears in the watch product:**

*A tsunami has been generated which could impact coastal areas of (list your area here). Observed tsunami wave heights from this earthquake have been*

*\_\_\_\_\_ FEET at \_\_\_\_\_ (LOCATION) and \_\_\_\_\_ FEET  
at \_\_\_\_\_ (LOCATION) around \_\_\_\_\_ AM / PM AST.*

---

**Once again, a TSUNAMI WATCH is in effect for Puerto Rico and the Virgin Islands at \_\_\_\_\_ AM / PM AST.**

**A TSUNAMI WATCH means that the risk of a tsunami has increased, but its occurrence and timing are still uncertain.**

**If you are in the TSUNAMI WATCH area, stay posted on this potential hazard and be alert for instructions from local emergency officials. Your National Weather Service Office in San Juan will continue to monitor the situation, and will provide updates on NOAA Weather Radio every half hour or sooner as conditions warrant."**

**Appendix B (Español):**

**CRS/NWR Pre-formato en español para una Vigilancia de Tsunami**

Cuando se reciba **una vigilancia de tsunami** (TSUATE) del (NTWC) que incluya toda o parte del área, imprime esta forma y llena los blancos basado en la información incluida en la vigilancia de tsunami. Seguir el procedimiento apropiado para diseminar el siguiente mensaje a través de CRS/NWR. Verificar que se hayan seleccionado los transmisores apropiados para diseminar la vigilancia de tsunami. Grapar esta forma a la lista de cotejo para vigilancias de tsunami. Completar los blancos del siguiente mensaje y leerlos.

**"El Servicio Nacional de Meteorología ha emitido una VIGILANCIA DE TSUNAMI para las áreas costeras de Puerto Rico e Islas Virgenes a las \_\_\_\_\_ AM / PM AST. Un fuerte terremoto, con un magnitud preliminar de \_\_\_\_\_, ha sido detectado aproximadamente a \_\_\_\_\_ millas \_\_\_\_\_ (dirección) de \_\_\_\_\_ (localización).**

**Aunque es un tanto incierto si un tsunami impactará el área bajo VIGILANCIA DE TSUNAMI, la llegada de la primera ola del tsunami ha sido estimada para los siguientes lugares:**

\_\_\_\_\_ (LOCALIZACION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCALIZACION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCALIZACION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCALIZACION) \_\_\_\_\_ AM / PM AST.

---

**Incluir la siguiente sección italizada si esta información aparece en la vigilancia de tsunami:**

*Se ha generado un tsunami el cual puede impactar la zona costera (mencionar el area). La altura de las olas de tsunami observadas con este terremoto han sido \_\_\_\_\_ pies en \_\_\_\_\_ (LOCALIZACION) Y \_\_\_\_\_ pies en \_\_\_\_\_ (LOCALIZACION) alrededor \_\_\_\_\_ AM / PM AST.*

---

**Una vez más, una VIGILANCIA DE TSUNAMI esta en efecto para Puerto Rico e Islas Virgenes a las \_\_\_\_\_ AM / PM AST.**

**Una VIGILANCIA DE TSUNAMIS significa que el riesgo de un tsunami ha incrementado, pero su ocurrencia y hora de arribo es incierta.**

**Si se encuentra en el área de VIGILANCIA DE TSUNAMI, manténgase informado de esta amenaza potencial y esté alerta a instrucciones de los oficiales de manejo de emergencias. Su Oficina del Servicio Nacional de Meteorología en San Juan seguirá monitoreando la situación y proveerá actualizaciones a través de Radio NOAA cada media hora o antes, según las condiciones ameriten.**

## **Appendix C: CRS/NWR Broadcast Template for Tsunami Warning**

Upon receipt of a **Tsunami Warning** product (TSUATE) from the NTWC that includes all or a portion of your area, print this form and fill it out based on information included in the Tsunami Warning product. Use the proper procedures to get the message below disseminated via CRS/NWR. Be sure to select the appropriate coastal transmitters that the Tsunami Warning will play on. Attach this form to the Tsunami Warning checklist. Here is the message to fill out and read:

**"The National Weather Service has issued a TSUNAMI WARNING for coastal areas in Puerto Rico and the Virgin Islands, at \_\_\_\_\_ AM / PM AST. A large earthquake, with a preliminary magnitude of \_\_\_\_\_, has been detected approximately \_\_\_\_\_ miles \_\_\_\_\_ (direction) of \_\_\_\_\_ (location).**

**The arrival times for the initial tsunami waves are estimated for the following locations:**

\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.

---

**Include the following italicized section if this information appears in the warning product:**

*A tsunami has been generated which could impact coastal areas of (list your area here). Observed tsunami wave heights from this earthquake have been*

*\_\_\_\_\_ FEET at \_\_\_\_\_ (LOCATION) and \_\_\_\_\_ FEET  
at \_\_\_\_\_ (LOCATION) around \_\_\_\_\_ AM / PM AST.*

---

**Once again, a TSUNAMI WARNING is in effect for the coastal areas in Puerto Rico and the Virgin Islands at \_\_\_\_\_ AM / PM AST.**

**A TSUNAMI WARNING means that a tsunami is (circle one): occurring, imminent, or highly likely.**

**Tsunamis are a series of waves which could be dangerous for several hours after the initial tsunami flood wave arrives.**

**If you are in the TSUNAMI WARNING area, stay alert for instructions from local emergency officials. Anyone in low lying areas in the TSUNAMI WARNING area should move immediately inland or to high ground. Your National Weather Service Office in San Juan will continue to monitor the situation and will provide updates on NOAA Weather Radio every half hour or sooner as conditions warrant."**

*Note: The warning coordinator can add information (call to action statements, etc...) to the last paragraph above, from the "EVALUATION" portion of NTWC's Tsunami Warning product if s/he deems it appropriate.*

**Appendix C: (Español)**

**CRS/NWR Pre-formato en español para un Aviso de Tsunami**

Cuando se reciba **un aviso de tsunami** (TSUATE) del (NTWC) el cual incluya toda o una porción de su área, imprima esta forma y llene los blancos basado en la información incluida en el aviso de tsunami. Seguir el procedimiento apropiado para diseminar el siguiente mensaje a través de CRS/NWR. Verificar que se hayan seleccionado los transmisores costeros apropiados para diseminar el aviso de tsunami. Grapar esta forma a la lista de cotejo para avisos de tsunami. Completar los blancos del siguiente mensaje y leerlos.

**"El Servicio Nacional de Meteorología ha emitido un AVISO DE TSUNAMI para las áreas costeras de Puerto Rico e Islas Virgenes a las \_\_\_\_\_ AM / PM AST.**

**Un fuerte terremoto, con un magnitud preliminar de \_\_\_\_\_, ha sido detectado aproximadamente a \_\_\_\_\_ millas \_\_\_\_\_ al (dirección) de \_\_\_\_\_ (localización).**

**La llegada de las primeras ola del tsunami ha sido estimada para los siguientes lugares:**

\_\_\_\_\_ (LOCALIZACION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCALIZACION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCALIZACION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCALIZACION) \_\_\_\_\_ AM / PM AST.

---

**Incluir la siguiente sección italizada si esta información aparece en el aviso de tsunami:**

*Se ha generado un tsunami el cual puede impactar la zona costera (mencionar el área). La altura de las olas de tsunami observadas con este terremoto han sido \_\_\_\_\_ pies en \_\_\_\_\_ (LOCALIZACION) Y \_\_\_\_\_ pies en \_\_\_\_\_ (LOCALIZACION) alrededor \_\_\_\_\_ AM / PM AST.*

**Una vez más, un AVISO DE TSUNAMI esta para Puerto Rico e Islas Virgenes a las \_\_\_\_\_ AM / PM AST.**

**Un AVISO DE TSUNAMI quiere decir que (circule una): está ocurriendo, es inminente, o es altamente probable.**

**Los tsunamis son una serie de olas generadas por un terremoto submarino. Esta serie de olas pueden ser peligrosas por varias horas después de que haya llegado la ola inicial del tsunami.**

**Si usted se encuentra en una zona bajo AVISO DE TSUNAMI, manténgase atento a las instrucciones de los oficiales de manejo de emergencias. Todas las personas en áreas costeras bajas AVISO DE TSUNAMI deben moverse inmediatamente tierra adentro o lugares altos. Su Servicio Nacional de Meteorología en San Juan continuará monitoreando la situación y proveerá información actualizada via Radio NOAA cada hora o antes si las condiciones lo ameritan."**

*Nota: El coordinador de avisos puede añadir información (medidas de precaución, etc) al último párrafo arriba, del contenido del boletín de tsunami emitido por el NTWC si es apropiado.*

**Appendix D**

**CRS/NWR Broadcast Template for Tsunami Advisory**

Upon receipt of a **Tsunami Advisory** product (TSUATE) from the NTWC that includes all or a portion of your area, print this form and fill it out based on information included in the Tsunami Advisory product. Use the proper procedures to get the message below disseminated via CRS/NWR. Be sure to select the appropriate coastal transmitters that the Tsunami Advisory will play on. Attach this form to the Tsunami Advisory checklist. Here is the message to fill out and read:

**"The National Weather Service has issued a TSUNAMI ADVISORY for coastal areas in Puerto Rico and the Virgin Islands, at \_\_\_\_\_ AM / PM AST. A large earthquake, with a preliminary magnitude of \_\_\_\_\_, has been detected approximately \_\_\_\_\_ miles \_\_\_\_\_ (direction) of \_\_\_\_\_ (location).**

**The arrival times for the initial tsunami waves are estimated for the following locations:**

\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.  
\_\_\_\_\_ (LOCATION) \_\_\_\_\_ AM / PM AST.

---

**Include the following italicized section if this information appears in the advisory product:**

*A tsunami has been generated which could impact coastal areas of (list your area here). Observed tsunami wave heights from this earthquake have been*

*\_\_\_\_\_ FEET at \_\_\_\_\_ (LOCATION) and \_\_\_\_\_ FEET  
at \_\_\_\_\_ (LOCATION) around \_\_\_\_\_ AM / PM AST.*

---

**Once again, a TSUNAMI ADVISORY is in effect for the coastal areas in Puerto Rico and the Virgin Islands at \_\_\_\_\_ AM / PM AST.**

**A TSUNAMI ADVISORY means that a tsunami capable of producing strong currents or waves dangerous to persons in or very near the water is imminent or expected.**

**If you are in the TSUNAMI ADVISORY area, stay alert for instructions from local emergency officials. Persons in the TSUNAMI ADVISORY area should move out of the water, off the beach, and out of harbors and marinas. Your National Weather Service Office in San Juan will continue to monitor the situation and will provide updates on NOAA Weather Radio every half hour or sooner as conditions warrant."**

*Note: The warning coordinator can add information (call to action statements, etc...) to the last paragraph above, from the "EVALUATION" portion of NTWC's Tsunami Warning product if s/he deems it appropriate.*

**Appendix D: (Español)**

**CRS/NWR Pre-formato en español para una Advertencia de Tsunami**

Cuando se reciba una **Advertencia de Tsunami** (TSUATE) del (NTWC) el cual incluya toda o una porción de su área, imprima esta forma y llene los blancos basado en la información incluida en la advertencia de tsunami. Seguir el procedimiento apropiado para diseminar el siguiente mensaje a través de CRS/NWR. Verificar que se hayan seleccionado los transmisores costeros apropiados para diseminar la advertencia de tsunami. Grapar esta forma a la lista de cotejo para advertencias de tsunami. Completar los blancos del siguiente mensaje y leerlos.

**"El Servicio Nacional de Meteorología ha emitido una ADVERTENCIA DE TSUNAMI para las áreas costeras de Puerto Rico e Islas Virgenes a las \_\_\_\_\_ AM / PM AST.**

**Un fuerte terremoto, con un magnitud preliminar de \_\_\_\_\_, ha sido detectado aproximadamente a \_\_\_\_\_ millas \_\_\_\_\_ al (dirección) de \_\_\_\_\_ (localización).**

**La llegada de las primeras olas del tsunami ha sido estimada para los siguientes lugares:**

- \_\_\_\_\_ (LOCALIZACION) \_\_\_\_\_ AM / PM AST.

---

**Incluir la siguiente sección italizada si esta información aparece en la advertencia de tsunami:**

*Se ha generado un tsunami el cual puede impactar la zona costera (mencionar el área). La altura de las olas de tsunami observadas con este terremoto han sido \_\_\_\_\_ pies en \_\_\_\_\_ (LOCALIZACION) Y \_\_\_\_\_ pies en \_\_\_\_\_ (LOCALIZACION) alrededor \_\_\_\_\_ AM / PM AST.*

---

**Una vez más, una ADVERTENCIA DE TSUNAMI está en efecto para Puerto Rico e Islas Virgenes a las \_\_\_\_\_ AM / PM AST.**

**Una ADVERTENCIA DE TSUNAMI quiere decir que se espera o es inminente un tsunami capaz de producir olas o corrientes locales fuertes y peligrosas para las personas cerca del agua del mar o dentro de la playa.**

**Si usted se encuentra en una zona bajo ADVERTENCIA DE TSUNAMI, mantengase atento a las instrucciones de los oficiales de manejo de emergencias. Todas las personas en o cerca de la playa en la zona bajo ADVERTENCIA DE TSUNAMI deben salirse del agua, y alejarse de muelles y marinas. Su Servicio Nacional de Meteorología en San Juan continuará monitoreando la situación y proveerá información actualizada via Radio NOAA cada hora o antes si las condiciones lo ameritan."**

***Nota: El coordinador de avisos puede añadir información (medidas de precaución, etc) al último párrafo arriba, del contenido del boletín de tsunami emitido por el NTWC si es apropiado.***

## Appendix E

### **CRS/NWR Broadcast Template for Tsunami Cancellation**

Upon receipt of a tsunami warning/advisory/watch **cancellation** product (TSUATE) from the NTWC for all or portions of your area, print this form and fill it out based on information included in the cancellation product. Use the proper procedures to get the message below disseminated via CRS/NWR. Be sure to select the appropriate coastal transmitters that the tsunami cancellation information will play on. Attach this form to the tsunami warning/advisory/watch checklist. Here is the message to fill out and read:

**"The National Weather Service has canceled the TSUNAMI (WARNING / ADVISORY / WATCH) for coastal areas in Puerto Rico and the Virgin Islands, at \_\_\_\_\_ AM / PM AST. The National Tsunami Warning Center has determined that the tsunami danger for Puerto Rico and the Virgin Islands no longer exists.**

---

**Include the following italicized section if this information appears in the cancellation product:**

*A regional tsunami was generated from a magnitude \_\_\_\_\_ earthquake, approximately \_\_\_\_\_ miles \_\_\_\_\_ (direction) of \_\_\_\_\_. Observed tsunami wave heights from this earthquake were \_\_\_\_\_ FEET at \_\_\_\_\_ (LOCATION) and \_\_\_\_\_ FEET at \_\_\_\_\_ (LOCATION).*

---

**Once again, the TSUNAMI (WARNING / ADVISORY / WATCH) has been canceled for coastal areas in Puerto Rico and the Virgin Islands at \_\_\_\_\_ AM / PM AST. The National Tsunami Warning Center has determined that no tsunami danger exists for Puerto Rico and the Virgin Islands. Some coastal areas may experience small sea level changes. As local surf conditions can vary widely, the "all clear" determination must be made by local authorities.**

**This is the final statement on this situation that will be broadcast by your National Weather Service Office in San Juan. Our normal NOAA Weather Radio broadcast cycle will resume shortly."**

## Appendix E (Español):

### **CRS/NWR Pre-formato en español para una cancelación de mensaje de Tsunami**

Cuando se reciba un comunicado para cancelar una **Vigilancia/Aviso/Advertencia de Tsunami** (TSUATE) del (NTWC) el cual incluya toda o una porción de su área, imprima esta forma y llene los blancos basado en la información incluida en la advertencia de tsunami. Seguir el procedimiento apropiado para diseminar el siguiente mensaje a través de CRS/NWR. Verificar que se hayan seleccionado los transmisores costeros apropiados para diseminar la advertencia de tsunami. Grapar esta forma a la lista de cotejo para Vigilancia/Aviso/Advertencia de Tsunami. Completar los blancos del siguiente mensaje y leerlos.

**"El Servicio Nacional de Meteorología ha cancelado la VIGILANCIA/AVISO/ADVERTENCIA DE TSUNAMI para las áreas costeras de Puerto Rico e Islas Virgenes a las \_\_\_\_\_ AM / PM AST. El Centro Nacional de Avisos de Tsunami ha determinado que el peligro de tsunami para de Puerto Rico e Islas Virgenes, ya no existe.**

---

**Incluir la siguiente sección italizada si esta información aparece en el mensaje de cancelación:**

*Un tsunami regional fue generado por un terremoto de magnitud \_\_\_\_\_, aproximadamente \_\_\_\_\_ millas \_\_\_\_\_ (dirección) de \_\_\_\_\_. La altura de las olas de tsunami observadas con este terremoto han sido \_\_\_\_\_ pies en \_\_\_\_\_ (LOCALIZACION) Y \_\_\_\_\_ pies en \_\_\_\_\_ (LOCALIZACION) alrededor \_\_\_\_\_ AM / PM AST.*

---

**Una vez más, la (VIGILANCIA/AVISO/ADVERTENCIA) DE TSUNAMI ha sido cancelada para Puerto Rico e Islas Virgenes a las \_\_\_\_\_ AM / PM AST.**

**El Centro Nacional de Avisos de Tsunami ha determinado que el peligro de tsunami para de Puerto Rico e Islas Virgenes ya no existe.**

**Algunas zonas costeras pudieran experimentar pequeñas variaciones en el nivel del mar. Debido a que las condiciones de oleaje local pueden variar, el mensaje de que el peligro ha pasado debe ser emitido por las autoridades locales.**

**Este será el último comunicado emitido por su oficina del Servicio Nacional de Meteorología en San Juan. Dentro de poco comenzaremos con nuestro ciclo de información regular vía Radio NOAA.**

## Appendix F: Product Examples

### **Example of a segmented format Tsunami Warning/Advisory/Watch (TSUAT1 product) issued by NTWC:**

WEXX20 PAAQ 262327  
TSUAT1

BULLETIN  
TSUNAMI MESSAGE NUMBER 1  
NWS NATIONAL TSUNAMI WARNING CENTER PALMER AK  
727 PM EDT THU JUL 26 2012

AMZ250-252-254-256-130-135-150-152-154-156-158-SCZ054-056-  
NCZ106-108-110-045>047-080-081-094-095-098-103-104-270027-  
/T.NEW.PAAQ.TS.W.0059.120726T2327Z-000000T0000Z/  
COASTAL AREAS BETWEEN AND INCLUDING SOUTH SANTEE RIVER  
SOUTH CAROLINA TO DUCK NORTH CAROLINA  
727 PM EDT THU JUL 26 2012

...A TSUNAMI WARNING IS NOW IN EFFECT WHICH INCLUDES THE  
COASTAL AREAS OF SOUTH CAROLINA AND NORTH CAROLINA FROM  
SOUTH SANTEE RIVER SOUTH CAROLINA TO DUCK NORTH CAROLINA...

IF YOU ARE LOCATED IN THIS COASTAL AREA... MOVE INLAND  
TO HIGHER GROUND.

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD  
INUNDATION IS EXPECTED OR IS ALREADY OCCURRING. TSUNAMIS ARE  
A SERIES OF WAVES DANGEROUS MANY HOURS AFTER INITIAL ARRIVAL  
TIME. THE FIRST WAVE MAY NOT BE THE LARGEST.

AT 724 PM EASTERN DAYLIGHT TIME ON JULY 26 AN EARTHQUAKE WITH  
PRELIMINARY MAGNITUDE 6.9 OCCURRED 120 MILES SOUTHEAST OF  
WILMINGTON NORTH CAROLINA.

ESTIMATED TSUNAMI START TIMES FOR SELECTED SITES ARE...

CAPE HATTERAS	NORTH CAROLINA	826 PM	EDT	JULY 26
MYRTLE BEACH	SOUTH CAROLINA	1018 PM	EDT	JULY 26

THE TSUNAMI WARNING WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE.  
REFER TO THE INTERNET SITE [NTWC.ARH.NOAA.GOV](http://NTWC.ARH.NOAA.GOV) FOR MORE INFORMATION.

\$\$

## Appendix F - Continued: Product Examples

### **Example of a public format Tsunami Warning/Advisory/Watch (TSUATE product) issued by NTWC:**

WEXX30 PAAQ 262327  
TSUATE

BULLETIN  
PUBLIC TSUNAMI MESSAGE NUMBER 1  
NWS NATIONAL TSUNAMI WARNING CENTER PALMER AK  
727 PM EDT THU JUL 26 2012

...A TSUNAMI WARNING IS NOW IN EFFECT...

#### WARNINGS/ADVISORIES/WATCHES - UPDATED

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TSUNAMI WARNING IN EFFECT FOR...

- \* THE COASTAL AREAS OF SOUTH CAROLINA AND NORTH CAROLINA FROM SOUTH SANTEE RIVER SOUTH CAROLINA TO DUCK NORTH CAROLINA

#### PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE	6.9
* ORIGIN TIME	1924 EDT JUL 26 2012
	1824 CDT JUL 26 2012
	1924 AST JUL 26 2012
	2324 UTC JUL 26 2012
* COORDINATES	33.2 NORTH 76.2 WEST
* DEPTH	3 MILES / 5 KM
* LOCATION	145 MILES SW OF CAPE HATTERAS NORTH CAROLINA
	120 MILES SE OF WILMINGTON NORTH CAROLINA

#### IMPACTS FOR TSUNAMI WARNING AREAS

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

#### RECOMMENDED ACTIONS - UPDATED

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- \* IF YOU ARE IN A WARNING AREA - MOVE INLAND TO HIGHER GROUND.
- \* BE ALERT TO INSTRUCTIONS FROM YOUR LOCAL EMERGENCY OFFICIALS.

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

FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	FORECAST START OF OF TSUNAMI
* NORTH CAROLINA	
CAPE HATTERAS	2026 EDT JUL 26
* SOUTH CAROLINA	
MYRTLE BEACH	2218 EDT JUL 26

NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THIS MESSAGE WILL BE UPDATED IN 30 MINUTES.
- \* REFER TO THE INTERNET SITE [NTWC.ARH.NOAA.GOV](http://NTWC.ARH.NOAA.GOV) FOR MORE INFORMATION.
- \* CARIBBEAN COASTAL RESIDENTS OUTSIDE PUERTO RICO AND THE VIRGIN ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES FOR INFORMATION ON THIS EVENT AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV).

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**Appendix F - Continued: Product Examples**

**Example of a standard format Tsunami Information Statement (TIBATE product) issued  
by NTWC for an earthquake outside PR/VI area:**

WEXX32 PAAQ 262301  
TIBATE

PUBLIC TSUNAMI INFORMATION STATEMENT NUMBER 1  
NWS NATIONAL TSUNAMI WARNING CENTER PALMER AK  
701 PM AST THU JUL 26 2012

...THIS IS A TSUNAMI INFORMATION STATEMENT FOR THE U.S. AND CANADA  
EAST COASTS/ GULF OF MEXICO STATES/PUERTO RICO AND THE VIRGIN  
ISLANDS...

EVALUATION

- 
- \* THERE IS NO TSUNAMI DANGER FOR THE AREAS LISTED ABOVE.
  - \* AN EARTHQUAKE HAS OCCURRED WITH PARAMETERS LISTED BELOW.
  - \* EARTHQUAKES OF THIS SIZE ARE KNOWN TO GENERATE TSUNAMIS DANGEROUS TO SHORELINES NEAR THE SOURCE.

PRELIMINARY EARTHQUAKE PARAMETERS

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* MAGNITUDE	6.9
* ORIGIN TIME	1854 EDT JUL 26 2012
	1854 AST JUL 26 2012
	1754 CDT JUL 26 2012
	2254 UTC JUL 26 2012
* COORDINATES	12.1 NORTH 73.2 WEST
* DEPTH	21 MILES / 33 KM
* LOCATION	CARIBBEAN SEA

NEXT UPDATE AND ADDITIONAL INFORMATION

- 
- \* THIS WILL BE THE ONLY U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGE FOR THIS EVENT UNLESS ADDITIONAL INFORMATION BECOMES AVAILABLE.
  - \* REFER TO THE INTERNET SITE [NTWC.ARH.NOAA.GOV](http://NTWC.ARH.NOAA.GOV) FOR ADDITIONAL INFORMATION.
  - \* CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV).

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**Appendix F - Continued: Product Examples**

**Example of a standard format Tsunami Information Statement (TIBATE product) issued  
by NTWC for an earthquake within PR/VI area:**

WEXX32 PAAQ 151653  
TIBATE

PUBLIC TSUNAMI INFORMATION STATEMENT NUMBER 1  
NWS NATIONAL TSUNAMI WARNING CENTER PALMER AK  
1253 PM AST SUN SEP 15 2013

...THIS IS A TSUNAMI INFORMATION STATEMENT FOR THE U.S. AND CANADA  
EAST COASTS/ GULF OF MEXICO STATES/PUERTO RICO AND THE VIRGIN  
ISLANDS...

EVALUATION

- 
- \* THERE IS NO TSUNAMI DANGER FOR THE AREAS LISTED ABOVE.
  - \* BASED ON EARTHQUAKE INFORMATION AND HISTORIC TSUNAMI RECORDS  
THE EARTHQUAKE WAS NOT SUFFICIENT TO GENERATE A TSUNAMI.
  - \* AN EARTHQUAKE HAS OCCURRED WITH PARAMETERS LISTED BELOW.

PRELIMINARY EARTHQUAKE PARAMETERS

-----

* MAGNITUDE	6.2
* ORIGIN TIME	1245 EDT SEP 15 2013
	1245 AST SEP 15 2013
	1145 CDT SEP 15 2013
	1645 UTC SEP 15 2013
* COORDINATES	18.5 NORTH 66.2 WEST
* DEPTH	3 MILES
* LOCATION	40 MILES NW OF FAJARDO PUERTO RICO
	5 MILES NW OF SAN JUAN PUERTO RICO

NEXT UPDATE AND ADDITIONAL INFORMATION

- 
- \* THIS WILL BE THE ONLY U.S. NATIONAL TSUNAMI WARNING CENTER  
MESSAGE FOR THIS EVENT UNLESS ADDITIONAL INFORMATION  
BECOMES AVAILABLE.
  - \* REFER TO THE INTERNET SITE [NTWC.ARH.NOAA.GOV](http://NTWC.ARH.NOAA.GOV) FOR  
ADDITIONAL INFORMATION.
  - \* CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN  
ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER  
MESSAGES AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV).

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**Appendix F - Continued: Product Examples**

**Example of a Tsunami Seismic Information Statement (EQIAT1 product) issued by  
NTWC:**

SEXX60 PAAQ 262236  
EQIAT1

TSUNAMI SEISMIC INFORMATION STATEMENT  
NWS NATIONAL TSUNAMI WARNING CENTER PALMER AK  
636 PM AST THU JUL 26 2012

...THIS IS A TSUNAMI INFORMATION STATEMENT...

EVALUATION

-----  
\* AN EARTHQUAKE HAS OCCURRED - THERE IS NO TSUNAMI DANGER.

PRELIMINARY EARTHQUAKE PARAMETERS

-----  
\* MAGNITUDE 4.5  
\* ORIGIN TIME 1834 EDT JUL 26 2012  
1834 AST JUL 26 2012  
1734 CDT JUL 26 2012  
2234 UTC JUL 26 2012  
\* COORDINATES 18.1 NORTH 67.2 WEST  
\* DEPTH 20 MILES / 32 KM  
\* LOCATION 10 MILES SW OF MAYAGUEZ PUERTO RICO  
80 MILES SW OF SAN JUAN PUERTO RICO

NEXT UPDATE AND ADDITIONAL INFORMATION

-----  
\* THIS WILL BE THE ONLY NTWC MESSAGE ISSUED FOR THIS EVENT.  
  
\* THE EARTHQUAKE PARAMETERS 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.

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**Appendix F - Continued: Product Examples SPS**

**Example of Special Weather Statements**

THERE IS A TSUNAMI ADVISORY IN EFFECT FOR AAA...BBB...AND CCC COUNTIES. NO SIGNIFICANT COASTAL FLOODING IS EXPECTED TO BE PRODUCED BY THESE WAVES. HOWEVER...SOME AREAS OF THE COAST COULD EXPERIENCE DANGEROUS CURRENTS AND SURGES IN HARBORS AND BAYS DUE TO THIS TSUNAMI. CRESCENT CITY HARBOR IS ESPECIALLY AT RISK. THE THREAT IS EXPECTED TO BEGIN AFTER 9 PM LOCAL TIME AND COULD CONTINUE FOR SEVERAL HOURS. THE INITIAL WAVE MAY NOT BE THE LARGEST. COASTAL RESIDENTS ARE ADVISED TO STAY OUT OF THE WATER...OFF THE BEACH...AND AWAY FROM HARBORS AND MARINAS. WAVE HEIGHTS AND CURRENTS ARE AMPLIFIED BY AN IRREGULAR SHORELINE AND ARE DIFFICULT TO PREDICT. MARINERS IN WATER DEEPER THAN 600 FEET SHOULD NOT BE AFFECTED BY A TSUNAMI.

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

-----

...TSUNAMI ADVISORY IN EFFECT FOR XXX COAST...

THE NATIONAL WEATHER SERVICE HAS ISSUED A TSUNAMI ADVISORY FOR THE XXXX COAST.

THERE IS NO TSUNAMI WATCH OR WARNING IN EFFECT. REPEAT NO WATCH OR WARNING IS IN EFFECT. NO SIGNIFICANT COASTAL FLOODING IS EXPECTED TO BE PRODUCED BY THESE WAVES. HOWEVER...SOME AREAS OF THE COAST COULD EXPERIENCE DANGEROUS CURRENTS AND SURGES IN HARBORS AND BAYS DUE TO THIS TSUNAMI. COASTAL RESIDENTS ARE ADVISED TO STAY OUT OF THE WATER, OFF THE BEACH, AND AWAY FROM HARBORS AND MARINAS. WAVE HEIGHTS AND CURRENTS ARE AMPLIFIED BY IRREGULAR SHORELINE AND ARE DIFFICULT TO PREDICT.

PREDICTED ARRIVAL TIMES OF THE ONSET OF THE SEA LEVEL RISES ARE  
XXXX 928 PM  
YYYYY 1001 PM

THE SEA LEVEL RISES COULD CONTINUE FOR SEVERAL HOURS. THE INITIAL WAVE MAY NOT BE THE LARGEST. THE GREATEST SEA LEVEL RISE MAY NOT BE UNTIL AN HOUR AND A HALF AFTER THE INITIAL ONSET. THE LARGEST RISES ARE EXPECTED TO BE APPROXIMATELY XXX TO XX CENTIMETERS (OR X TO X INCHES) .

MARINERS IN WATER DEEPER THAN 600 FEET SHOULD NOT BE AFFECTED BY A TSUNAMI.

## **Appendix F - Continued: Product Examples SPS**

### **Example of Special Weather Statements**

...TSUNAMI ADVISORY IS IN EFFECT FOR THE IMMEDIATE COASTAL AREAS OF AAA AND YYY...

THIS IS NOT A TSUNAMI WARNING OR TSUNAMI WATCH. REPEAT...THIS IS NOT A TSUNAMI WARNING OR TSUNAMI WATCH.

HOWEVER...A MINOR TSUNAMI MAY BE RECORDED IN SOME AREAS OF THE COAST WHICH COULD PRODUCE DANGEROUS CURRENTS AND SURGES IN HARBORS AND BAYS. COASTAL RESIDENTS ARE ADVISED TO STAY OUT OF THE WATERS...OFF THE BEACH AND AWAY FROM HARBORS AND MARINAS. WAVE HEIGHT AND CURRENTS ARE AMPLIFIED BY IRREGULAR SHORELINE AND ARE DIFFICULT TO PREDICT. MINOR WAVE FLUCTUATIONS AROUND ONE FOOT ARE EXPECTED TO BEGIN AT:

XXXX.... AT 8:59 PM LOCAL TIME

YYYY.... AT 9:03 PM LOCAL TIME

ZZZZ..... AT 9:06 PM LOCAL TIME

UUUU..... AT 9:11 PM LOCAL TIME

THESE MINOR WAVE FLUCTUATIONS COULD CONTINUE FOR SEVERAL HOURS. THE INITIAL WAVE MAY NOT BE THE LARGEST. MARINERS IN WATER DEEPER THAN 600 FEET SHOULD NOT BE AFFECTED BY A TSUNAMI.

THE TSUNAMI ADVISORY IS A RESULT OF THE X.0 EARTHQUAKE THAT OCCURRED AT 10:48 AM ADT NEAR XXXX.

STAY TUNED TO YOUR LOCAL NEWS SOURCE AN NOAA WEATHER RADIO FOR FURTHER DEVELOPMENTS.

THIS PRODUCT WILL BE UPDATED IF ANY NEW DETAILS ARE AVAILABLE.

-----  
A STRONG EARTHQUAKE OCCURRED EARLIER TODAY NEAR XXX IN THE YYY OCEAN AND A TSUNAMI WAS GENERATED AND OBSERVED IN THAT AREA.

FOR THE XXX COAST...ONLY TSUNAMI WAVES OF A FEW INCHES ARE EXPECTED TO REACH THE COAST BETWEEN 10 AND 11 PM ATLANTIC TIME TONIGHT.

THERE IS NO...REPEAT...NO...TSUNAMI WATCH...WARNING OR ADVISORY IN EFFECT FOR THE XXX COAST. NO COASTAL FLOODING IS EXPECTED. THE MINIMUM WAVE HEIGHT FOR A TSUNAMI ADVISORY ON THE XXXX COAST IS X INCHES OR XX CENTIMETERS.

THE SMALL TSUNAMI WILL NOT BE VISIBLE AMONG THE COMMON OCEAN SURF..YET TIDE GAGES WILL LIKELY REPORT SMALL FLUCTUATIONS.

TO REPEAT...NO TSUNAMI WATCH...WARNING OR ADVISORY IS IN EFFECT FOR THE XXX COAST.

## Appendix G: Graphical Representation of Criteria

Area	NTWC-Pacific					Indian Ocean Basin	NTWC-Atlantic						Mag	
	AK, BC, WA, OR, CA <sup>A</sup>	Bering Sea Deep <sup>A</sup>	Arctic O., and Bering Shallow	Not in Pacific AOR <sup>A</sup>			East Coast US & Canada <sup>A</sup>	East Coast Inland <400 Mile	Gulf Mex Gulf St. L <sup>A</sup>	Puerto Rico/VI <sup>A</sup>	Not AOR Western Caribbean <sup>A</sup>	Not AOR Eastern Caribbean <sup>A</sup>		Not AOR Atlantic
Mag 4													Mag 4	
5	TIS*** SEAK71 or SEUS71	TIS*** SEAK71	TIS*** SEAK71				TIS*** SEX60/70		TIS SEX60/70					
6														
6.4														
6.5	TIS WEAK53	TIS WEAK53	TIS WEAK53	TIS WEAK53	Process Routinely					TIS WEXX32/42	TIS WEXX32/42	TIS WEXX32/42		
7														
7.1	Warning * 250km WEPA41 and WEAK51	Warning * Pribilof/ Aleutian Is. WEPA41 and WEAK51	Advisory** WEPA41 and WEAK51				Warning * 250km WEXX20/30/40	TIS WEXX32/42		Advisory* Puerto Rico/ VI WEXX20/30/40			TIS WEXX32/42	
7.5														
7.6	Warn/Adv* 500/500km WEPA41/51			TIS WEAK53 or Watch/Adv/ Warning WEPA41 and WEAK51										
7.8														
7.9	Warning 3W/W WEPA41/ WEAK51													
10														
Mag 4														Mag 4
5														
6														
6.4														
6.5														
7														
7.1														
7.5														
7.6														
7.8														
7.9														
10														

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

<sup>A</sup> if deeper than 100km and <7.9, use TIS

\* No Watch

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

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

3W/W => warning for area impacted within 3 hours and watch for rest of AOR

TIS = Tsunami Information Statement

WMO product IDs listed under message type

\*\* For Arctic; Advisory if south of 75N and west of 138W; else TIS

## NTWC Regional Boundaries in the Western Atlantic Basin

