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SOUTHERN REGION TSUNAMI WARNING OPERATIONS FOR SR CONUS COASTAL WFOS AND RFCS

NOTICE: This publication is available at: http://www.nws.noaa.gov/directives/.

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SUMMARY OF REVISIONS: This supplement supersedes Southern Region Supplement 03-07 dated August 20, 2013, filed with NWSI 10-701.

1. Removed references to the EQI and EQR products.
2. Changed all occurrences of West Coast / Alaska Tsunami Warning Center to National Tsunami Warning Center (NTWC).
3. Replaced detailed definition, break points, dissemination avenues, and criteria sections with links to overarching Directive (10-701) and/or websites.
4. Removed notification procedures to RFCs from certain WFOs.

<signed> March 12, 2019

Steven G. Cooper, Date
Regional Director

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1 Introduction

This Regional Supplement describes responsibilities and provides guidance to National Oceanic and Atmospheric Administration (NOAA) National Weather Service (NWS) 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 as it relates to tsunami services. Detailed procedures regarding the WFO San Juan tsunami warning operations program are contained in a separate supplement.

2 Tsunami Program Overview

2.1 Weather Forecast Offices (WFO)

The WFOs are 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. The offices 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). State Emergency Management Agencies (in Texas, Louisiana, Mississippi, Alabama, Georgia, and Florida) have the responsibility for developing warning procedures and emergency plans, and for making evacuation decisions for local communities, using information from the WFOs and RFCs. The Station Duty Manual (SDM) will document specific (localized) procedures.

2.2 River Forecast Centers (RFC)

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

2.3 National Tsunami Warning Center (NTWC)

In SR, the NTWC provides tsunami warning services for potential tsunami events that may affect the U.S. coastline areas of the western Atlantic basin, including the Caribbean and Gulf of Mexico.

2.4 Pacific Tsunami Warning Center (PTWC)

The PTWC is the backup for NTWC. Additionally, PTWC provides tsunami warning services to Puerto Rico (PR) and the US Virgin Islands (USVI).

2.5 Caribbean Tsunami Warning Program (CTWP)

The CTWP supports both US Territories in the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Intergovernmental Oceanographic Commission **(**IOC) Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE-EWS) Member States. CTWP supports (1) establishing and strengthening their national and regional systems, (2) training and capacity building to ensure timely delivery and understanding of products to countries and communities, (3) supporting TsunamiReady® and TsunamiReady® implementation and (4) supporting the delivery of earthquake and tsunami data to the Tsunami Warning Centers (TWC)s. CTWP is administratively overseen by the NWS Pacific Region.

3 Tsunami Program Procedures

The NTWC monitors the Atlantic basin, Caribbean, and Gulf of Mexico for seismic events. If a seismic event occurs in the Atlantic and meets the seismic magnitude and location criteria listed in Section 3.2 of NWSI 10-701 (also found on the tsunami.gov website), the NTWC will issue Tsunami Warnings, Advisories, Watches, or Informational products for the Southern and Eastern United States.

The WFOs relay the tsunami information on NWR broadcasts. Updates are provided by WFOs and RFCs via localized products to customers and partners during and after events. WFOs conduct outreach and education, including collaboration with Emergency Managers and partners, for a successful tsunami program and awareness.

4 NTWC Products

4.1 Definitions

Tsunami product definitions are located in Section 2.1 of NWSI 10-701.

4.2 Tsunami Text Products

All products issued by both the PTWC and NTWC can be found here: http://tsunami.gov/?page=product_list.

The following are the products (with examples) specific to SR CONUS coastal offices:

U.S. Atlantic, Gulf of Mexico, Canada	Example: WEXX20 PAAQ Example: WEXX20 PAAQ Example: WEXX20 PAAQ	TSUAT1	Segmented Tsunami Warnings, Watches, and Advisories
	Example: WEXX30 PAAQ Example: WEXX30 PAAQ Example: WEXX30 PAAQ	TSUATE	Tsunami Warnings, Watches, and Advisories
	Example: WEXX40 PAAQ Example: WEXX40 PAAQ Example: WEXX40 PAAQ	TSUSPA	Spanish Tsunami Warnings, Watches, and Advisories
	Example: WEXX32 PAAQ	TIBATE	Tsunami Information Statements
	Example: WEXX42 PAAQ	TIBSPA	Spanish Tsunami Information Statements

5 NTWC Dissemination

NTWC disseminates tsunami products over numerous dissemination routes. Details and specifics are located in Section 2.7 of NWSI 10-701.

6 Criteria for Tsunami Products

The criteria used to determine product issuance from both the PTWC and NTWC can be found at these two links:

http://ntwc.arh.noaa.gov/images/procChartLargeAtlantic.gif and
http://ntwc.arh.noaa.gov/images/procChartLargePacific.gif

7 Break Points

The break points used by NTWC are located in Section 2.4.1 of NWSI 10-701.

8 WFO Communication and Dissemination

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

8.1 WFO Communication

1. Advanced Weather Interactive Processing System
   All SR coastal WFOs and coastal RFCs *must* ensure all of the products listed in

Sections 4.2 are *alarmed* in AWIPS. In addition, offices must ensure after each AWIPS build (or crash) that the products are reconfigured to be alarmed.

2. Contact logs
Your office will likely receive numerous calls from the media, public, emergency managers, etc. during earthquake and tsunami events. The office will log all calls initiated or received, as well as any subsequent actions.

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 these phones are located and how to use them.

4. Decision Support Services
Provide Impact-based Decision Support Services (IDSS) to core partners. Provide information and interpretative services to directly support tsunami event information that may have a direct impact on the protection of lives/livelihoods.

5. Social Media
Use social media, when appropriate, to pass on warnings and information to the public related to tsunami events.

6. Configure NWRWaves for proper Emergency Alert System (EAS) Notification
It is *imperative* that the appropriate WFO staff (usually the Warning Coordination Meteorologist (WCM)) coordinate with the NWR Focal Point, Observing Program Leader (OPL), or Electronic Technician (ET) staff to configure NWRWaves for the proper Emergency Alert System (EAS) code for Tsunami Warnings, Advisories, and Watches for the County Warning Area (CWA).

Each WFO will need to do an initial set-up to ingest the TSUAT1. At that point, the Broadcast Message Handler (BMH) will handle the process of EAS codes and tone alerting.

The office will use the NWRWaves Product Configuration GUI to either set up or verify the correct configuration for tone alerts. When properly configured, the tone alert would then set off the EAS activation.

7. EAS Codes for Tsunami Watches and Warnings
Use TSW for Tsunami Warning messages
Use TSA for Tsunami Watch messages

8. EAS Codes for Tsunami Advisories
A Tsunami Advisory EAS code is not available. When a Tsunami Advisory is issued, use the TSW EAS code on NWR and then broadcast the Tsunami Advisory text.

NOTE: While SR would like to be consistent at all SR CONUS Coastal WFOs using the same EAS code for Tsunami Advisories, if local customers and partners prefer a different EAS code (or none), WCMs will coordinate this with them.

Options include
(a) Civil Emergency Message (CEM), or
(b) Coastal Hazards Message (CFW), or
(c) Tsunami Warning message (TSW) / Tsunami Watch message (TSA).

If the decision is different than using a TSW EAS code, the WCM will coordinate this information with the NWR Focal Point, OPL, or ET so they can configure BMH for the proper EAS code in your CWA for Tsunami Advisories.

Also note this in your SDM and on your Google Site.

8.2 NOAA Weather Radio All Hazards (NWR) and Emergency Alert System (EAS) Activation

8.2.1 When a Tsunami Warning, Advisory, or Watch is Issued for Your Area

1. Broadcast on NWR

a. Tsunami Watches and Warnings

Tsunami Watches and Warnings (TSUAT1) are configured to go to the pending side of NWRWaves. Forecasters should Quality Check (QC) the product to ensure it's not a test message and/or if the wording is what you want broadcast over NWR for your area. When ready to be sent to NWR, select "send to CRS."

As a reminder: 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 on NWR).

b. Tsunami Advisories

Tsunami Advisories (TSUAT1) are configured to go to the pending side of NWRWaves. As a reminder, the EAS code will be TSW, but the text will be of the Tsunami Advisory product. Forecasters should QC the product to ensure it's not a test message and/or if the wording is what you want broadcast over NWR for your area. When ready to be sent to NWR, select "send to CRS."

NOTE: Please see note in Section 8.1.6 above that the EAS code may differ from

TSW.

2. Issue Special Weather Statements for Updates
If a Tsunami Warning, Advisory, and/or Watch is issued by NTWC for any part of the CWA, WFOs should issue Special Weather Statements (SPS) at intervals between the NTWC tsunami 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. 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, if available.

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 request EAS activation for the appropriate product above (Tsunami Warning, Advisory, or Watch).

The SDM will note where all the PEP information is located in your office.

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 your area, then the earthquake would likely not be felt and therefore the TIB should not be disseminated on NWR.

However, if a TIB is issued for an earthquake that IS felt by the public in your CWA, then you should be disseminated the TIB on NWR. 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, an SPS or Public Information Statement (PNS) product may be issued from AWIPS and/or disseminated on NWR to help minimize media/public concerns. See this link for TIB product example.

8.2.3 When the Tsunami Warning, Advisory, or Watch is Cancelled

If the NTWC cancels the Tsunami Warning, Advisory, or Watch, the TSUAT1 product will go to pending side of NWRWaves. QC the product and then when ready to be sent to NWR, select "send to CRS."

Issue a final SPS to relay the information that a Tsunami Warning, Advisory, or Watch was cancelled.

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.

9 Local Earthquakes

An SPS may be issued for earthquakes that occur across the CWA to inform the public about the potential of a tsunami.

Create SPS templates in AWIPS for quick editing.

There are three types of scenarios:

Earthquake Strength	Information Received yet from NTWC?	Procedure to Follow
Any felt earthquakes	Yes	Section 8.2.1.2
Strong* earthquakes	No ***	Section 9.1
Light to moderate** earthquakes	No ***	Section 9.2

* 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.

*** If information about the earthquake has not been disseminated by NTWC yet, the office will try to contact them before issuing any local products.

9.1 Special Weather Statement (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 your office is waiting to receive Tsunami messages from NTWC. When a strong earthquake occurs and no information is available from NTWC and they also cannot be reached, the office should issue an SPS as described below.

SPSs can be issued for strong, felt earthquakes for several reasons:

a. Your office may not hear from NTWC because the earthquake is so strong that

communication lines are down.

b. SPS can alert the public that a tsunami is possible if your office has not yet heard from NTWC, but the earthquake is strong enough that a tsunami may be imminent.
c. Issuing an SPS before tsunami products are received from NTWC may be prudent because strong earthquakes can create numerous media and public inquiries.

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 (without damage reports)

A strong earthquake was felt near _____ 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 noticeable rise or fall of sea level along the coast. A tsunami is a series of waves that could be dangerous for several hours after the initial wave arrives.

Continue to monitor NOAA Weather Radio or your local news source for more information. Updated information will be issued later by emergency management officials, the National Tsunami Warning Center, and (your office).

2. Example 2: SPS Wording for Strong Earthquake (with damage reports)

A strong earthquake was felt near _____at about _____ (AM / PM). The exact 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 that could be dangerous for several hours after the initial wave arrives.

Continue to monitor NOAA Weather Radio or your local news source for more information. Updated information will be issued later by emergency management officials, the National Tsunami Warning Center, and (your office).

9.2 SPS for Light/Moderate Earthquakes

An SPS can be utilized after a light/moderate earthquake that is felt widely by the population and has generated numerous media and public inquiries, but information neither has been received from 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:

Example: SPS Wording for Light/Moderate Earthquakes

A {light/moderate} earthquake occurred at _____ (AM / PM) in _____ (location).

Given the reported intensity of the earthquake, at this time it is believed there is NO tsunami threat for (your area).

Continue to monitor your local news source for more information. Updated information will be issued by emergency management officials.

9.3 Earthquake Reporting

When an earthquake is felt but not strong enough for an SPS, the WFO may want to report the felt earthquake for public awareness. If so, please confirm with the USGS Earthquake Hazards Official website first and then issue a local PNS, if desired.

10 Dissemination Tests for WFOs and RFCs

Dissemination tests will be conducted for tsunami products by NTWC to ensure products are received by the NWS and its partners. The NTWC strives to disseminate a test TSTMSG product quarterly (sometimes more) to WFOs, RFCs, the FAA, and Federal and State emergency managers.

After receipt of the NTWC tsunami test product, WFOs and RFCs will respond immediately by disseminating a local Tsunami Acknowledgement Message (TMA) from AWIPS, as specified below. The TMA product is received at NTWC to validate operation of the communication system.

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

Example of a TMA message sent to NTWC

SEUS42 KJAX 231410
TMAJAX

This is only a test. (add)

TSTMSG RCVD AT **231305** (this is the time you received the product, not the time this test message is transmitted)

$$

Important Note: The TMA product is NOT to be sent during actual events; it's only disseminated during monthly tests.

11 Procedures Used to Notify Southern Region Headquarters

To Southern Region Headquarters (SRH) from WFO Jacksonville
Anytime NTWC issues a Tsunami Warning, Advisory, or Watch for Southern Region's area or the Atlantic Basin, WFO Jacksonville will notify SRH by calling the Southern Region Regional Operations Center (ROC) at 682-703-3747.

If communications at WFO Jacksonville are inoperative, WFO Tampa will call SR ROC.

For all WFOs
If a tsunami event occurs that has a significant impact on the population within your area of responsibility and is quickly gaining national media attention, please call the SR ROC at 682-703-3747.

12 Drills

Because earthquakes do not occur regularly, completion of drills is critical to maintaining operational proficiency. SR CONUS coastal WFOs will conduct at least one annual drill related to tsunami program procedures and will notify the SRH Tsunami Program Manager when the drill is completed by staff members. SRH will keep a record of the annual drills each office conducts.

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: □ Tsunami Advisories, Warnings, and Watches (TSUAT1) are configured to go to the pending side of NWRWaves. Forecasters should QC the product to ensure it's not a test message and/or if the wording is what you want broadcast over NWR for that transmitter. When ready to be sent to NWR, select "send to CRS." □ Log in your office shift log 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 Broadcast Message Handler (BMH) programming at an absolute minimum. This should all be programmed to happen automatically on BMH.
_____/_____	Issue an SPS product at intervals between the NTWC product and broadcast on NWR. The SPS product should provide updates and/or local information (see Section 8.2.1.2 for details).
_____/_____	Consider any additional actions that may enhance community response to this watch/warning. These may include additional phone calls and/or IDSS briefing package(s) and/or conference calls to local emergency managers, law enforcement, fire departments, etc., where impact may be particularly damaging. Additional actions include using social media where appropriate. Record all of these actions.
_____/_____	Continue to record updates from NTWC to BMH as well as SPS products issued from your local office.
_____/_____	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.

_____/_____ 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.

Time Completed	CANCELLATION CHECKLIST
_____/_____	**Put the cancellation on NWR as follows:** □ Cancellation messages are configured to go to the pending side of NWRWaves. Forecasters should QC the product to ensure it's not a test message and/or if the wording is what you want broadcast over NWR for that transmitter. When ready to be sent to NWR, select "send to CRS." □ Log in your office shift log the time your message was initially broadcast on NWR. □ Set expiration to one hour.
_____/_____	Update the MIC and WCM.
_____/_____	Retain <u>all</u> records of this event and provide to the WCM.