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

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<Signed by>

March 7, 2007

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Date

Acting Regional Director, Southern Region

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1. **Introduction.**

This Regional Supplement describes responsibilities and provides guidance to 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 (detailed procedures regarding the WFO San Juan tsunami warning operations program are contained in a separate Supplement).

The WFOs are responsible for planning for and taking appropriate action when there is a threat of a tsunami, including dissemination of tsunami watches and warnings. They are also responsible for ensuring the readiness of office staff and systems through routine operational drills, for coordinating community outreach activities to increase tsunami hazard awareness, and to assist 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 to develop warning procedures, plans and evacuations for local communities, along with the WFOs and RFCs. Specific (localized) procedures will be included in the WFO Station Duty Manual (SDM). The SR RFCs are responsible for preparing mainstream river and flood forecasts guidance for appropriate locations near the coastal areas that may be affected by tsunamis.

2. **Tsunami Program Procedures for the SR CONUS Coastal Weather Forecast Offices and River Forecast Centers.**

The WC/ATWC monitors the Atlantic for seismic events. If a seismic event occurs in the Atlantic and meets the seismic magnitude and location criteria listed in Sections 2.4.1 and 2.4.2, WC/ATWC will issue Tsunami Warnings, Watches or Informational products for the Southern and Eastern United States. The WFOs broadcast this information on NOAA Weather Radio All Hazards (NWR). Updates are provided to local customers and partners throughout and after events by WFOs and RFCs.

2.1. **Communications.**

a. **Advanced Weather Interactive Processing System (AWIPS).**

Both RFCs and WFOs *must* ensure all of the products listed in Sections 2.2.a, 2.2.b and 2.2.c are *alarmed* in AWIPS. In addition, ensure after each AWIPS build (or crash) that the products are reconfigured to be alarmed.

b. **Contact logs.**

SR offices 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.

c. **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.

2.2 WC/ATWC Products.

The products that WC/ATWC issue are detailed below.

a. Warnings, Watches and Cancellation Messages.

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

WEXX20 PAAQ ANCTSUAT1 – Standard format product

WEXX30 PAAQ ANCTSUATE – Public friendly product

Where, TSU = Tsunami Watch, Warning or Cancellation product

(See Table 1 and Table 2 in Section 2.4 for the criteria of Tsunami Warnings and Watches).

The TSUATE product is narrative and referred to as “public friendly”, whereas the TSUAT1 product is tabular in format and referred to as the “standard format.” Both the “public friendly” and “standard format” TSU products are issued during watch/warning events. See Appendix E for examples.

WC/ATWC will collect, review, and diagnose data and issue follow-up statements every 30 minutes under TSUAT1 and TSUATE. If a tsunami is no longer expected, the WC/ATWC will issue a cancellation message under the same product IDs (TSUAT1 and TSUATE). The TSU products are also used for the issuance and cancellation of tsunami watches and warnings, as well as the issuance of follow-up statements.

b. Tsunami Information Statements.

A Tsunami Information Statement (TIB) usually is issued when the magnitude of a seismic event is above 6.0 but below watch/warning criteria. The TIB is also based on location of a seismic event – see Sections 2.4.1 and 2.4.2 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 identifiers for the Tsunami Information Statements are:

WEXX22 PAAQ ANCTIBAT1 – Standard format product

WEXX32 PAAQ ANCTIBATE – Public friendly product

Where, M = Magnitude and TIB = Tsunami Information Statement

The TIBATE product is narrative and referred to as “public friendly”, whereas the TIBAT1 product is tabular in format and referred to as the “standard format.” Both TIB products are issued during seismic events of $M \geq 6.0$ but below watch/warning criteria.

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

c. 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 2.4.1 and 2.4.2). The WMO heading and AWIPS identifier for the Tsunami Seismic Information Statement is:

SEX60 PAAQ ANCEQIAT1 – Issued when $M < 6.0$ and > 4.0

Where, EQI = Tsunami Seismic Information Statement

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

2.3 Dissemination.

WC/ATWC will relay the TSU, TIB and EQI tsunami products for the Atlantic via all of the following avenues:

- broadcast over National Warning System (NAWAS),
- dissemination via National Airspace Data Interchange Network (NADIN2), NOAA Weather Wire Service (NWWS), Line225 (NWS Circuit and AWIPS feed), email, digital pagers, Quake Data Distribution System (QDDS), and post on WC/ATWC web site, and
- telephone contact with the Naval Meteorological and Oceanographic Center (NMOC),
- telephone contact with the Pacific Tsunami Warning Center (PTWC),
- telephone contact with the National Earthquake Information Center (NEIC), and
- telephone contact with the U. S. State Department Operations Center.

2.4 Procedural Thresholds.

If an earthquake is detected in the Atlantic area or the Gulf of Mexico, the WC/ATWC will issue a Tsunami Warning, Tsunami Watch or Information product using the thresholds in Sections 2.4.1 and 2.4.2. Table 1 and Table 2 depict the criteria for the issuance of tsunami-related products.

2.4.1 Events Near the Atlantic Coast or Gulf of Mexico.

See Appendix F for a graphical representation of this criteria and the WC/ATWC 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	Within 150km of coast	Tsunami <u>Seismic</u> Information Statement	ANCEQIAT1
5.0 - 5.9	Gulf of Mexico or within approximately 500km of the Atlantic coast	Tsunami <u>Seismic</u> Information Statement	ANCEQIAT1
6.0 - 6.75	Gulf of Mexico or within approximately 500km of the Atlantic coast	Tsunami Information Statement	ANCTIBAT1 and ANCTIBATE
6.0+	Inland	Tsunami Information Statement	ANCTIBAT1 and ANCTIBATE
6.8 - 7.5	Atlantic coast	Fixed warning (350km)*	ANCTSUAT1 and ANCTSUATE
7.6 - 7.8	Atlantic coast	Fixed warning (1000km)*	ANCTSUAT1 and ANCTSUATE
>7.8	Atlantic coast	3 hour watch/3 hour warning**	ANCTSUAT1 and ANCTSUATE
>= 6.8	Gulf of Mexico	Fixed warning for Gulf Coast	ANCTSUAT1 and ANCTSUATE

Note: "Atlantic coast" includes the coasts of eastern Canada.

* "fixed warning (350 km/1000 km)" indicates that after an Atlantic coast earthquake in the magnitude range of 6.8-7.8, a Tsunami Warning will be issued to the next breakpoint (see section 2.5) beyond 350km/1000km in both directions along the coast. No watch will be issued, and the warning area will not be expanded unless conditions warrant.

** Since earthquakes over magnitude 7.8 can trigger dangerous tsunamis outside the immediate source zone, an expanding warning is issued. "3 hour watch/3 hour warning" indicates that all regions within 3 hours travel time of the tsunami would be placed in the warned area. A Tsunami Watch is issued for the areas that may potentially be impacted by the wave in 3 to 6 hours. The Tsunami Warning and Watch areas will expand correspondingly in supplemental messages until the wave has been characterized well enough to cancel the warning, restrict it to certain areas, or expand it to the entire coast.

2.4.2 Other Atlantic Basin Regions.

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

Magnitude	Area	Threat Level	Product
6.0-7.5 7.0-7.5	Caribbean Sea Other Atlantic regions	No Danger	ANCTIBAT1 and ANCTIBATE
> 7.5	Atlantic basin (No potential danger to Area of Responsibility)	No Danger	ANCTIBAT1 and ANCTIBATE
> 7.5	Atlantic basin (Potential danger to Area of Responsibility)	Estimated time of arrival dependent: Potential danger	ANCTIBAT1 and ANCTIBATE or ANCTSUA1 and ANCTSUA2

‘Atlantic basin’ in Table 2 above refers to the area within the Atlantic basin that is not within WC/ATWC’s prescribed AOR. WC/ATWC blocks off the AOR geographically, then the other areas outside that are considered ‘Atlantic basin.’ It is generally about 500km off the coast. See Appendix F for a graphical representation of this criteria and the WC/ATWC AOR.

2.5 Break Points.

In the tsunami watch/warning product, breakpoints along the coast are used to define the areal extent of the watch and/or warning. Below are the designated breakpoints used by the WC/ATWC for the Southern and Eastern U.S.:

- | | |
|--------------------|-------------------------------|
| Brownsville, TX | Flagler Beach, FL |
| Baffin Bay, TX | Altamaha Sound, GA |
| Port O’Connor, TX | South Santee River, SC |
| High Island, TX | Surf City, NC |
| Morgan City, LA | Duck, NC |
| MS/AL Border | Chesapeake Bay, Smith Pt., VA |
| Destin, FL | Cape Henlopen, DE |
| Suwannee River, FL | Sandy Hook, NJ |
| Bonita Beach, FL | Watch Hill, RI |
| Flamingo, FL | Merrimack River, MA |
| Ocean Reef, FL | Stonington, ME |
| Jupiter Inlet, FL | US/Canada Border |

Whenever the boundary of a watch or warning lies between two breakpoints, the watch or warning will be extended to, and include, the next breakpoint.

3. **WFO Procedures.**

Coastal WFOs in the affected area of a tsunami watch or warning 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.

3.1 **NOAA Weather Radio All Hazards (NWR) Activation.**

a. **When a Tsunami Watch or Tsunami Warning is issued for your area:**

1) **NWR Activation.**

When a Tsunami Watch or Tsunami Warning has been issued by WC/ATWC for your area, affected coastal WFOs will *immediately* activate the Emergency Alert System (EAS) and tone alert (both 1050HZ and SAME [Specific Area Message Encoding]) the NWR Console Replacement System (CRS) for all affected NWR coastal transmitters and read the tsunami information on NWR. Sample broadcast templates are provided in Appendix B (for a Tsunami Watch) or Appendix C (for a Tsunami Warning). Use information in the TSUAT1 product to fill in the appropriate template and then use it as a broadcast script.

Note: *Only tone alert* the proper EAS codes on NWR and read from the broadcast template script (located in Appendix B and C). Specifically, ***do not*** issue a TSW, TSA, CEM, CFW product from AWIPS.

2) **EAS Codes.**

One of the following three EAS codes should be used for tsunami EAS dissemination on CRS:

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

Note in your Station Duty Manual (SDM) which EAS code your office should use to activate NWR. The EAS code your office uses for Tsunami Watches and Warnings must be collaborated with your partners to ensure their systems are configured to receive those EAS codes.

Also note in your SDM which transmitters should be activated for tsunami information.

3) **Issue Special Weather Statements for Updates.**

If a Tsunami Warning and/or Tsunami Watch is issued from WC/ATWC for your County Warning Area (CWA), WFOs should issue Special Weather Statements (SPS) every 30 minutes. Similar to Hurricane Local

Statements, these SPSs are intended to provide timely updates to customers and partners while the tsunami warning/watch is in effect and WC/ATWC collects, reviews, and diagnoses data. In most cases, the SPS will reemphasize the information in the WC/ATWC products while adding additional local impact information such as flooding and any messages relayed by Emergency Managers, if available. When a tsunami warning or watch is cancelled, use the SPS to relay this information. Broadcast the SPSs on NWR.

b. When a Tsunami Information Statement (TIB) or Tsunami Seismic Information Statement (EQI) is Issued for Your Area:

If the WC/ATWC issues a TIB or EQI product for your area, a tsunami is unlikely. TIBs or EQIs do not need to be disseminated over NWR. However an earthquake that is felt may increase the number of phone calls or activities at an office. Therefore, at forecaster discretion, either a Public Information Statement (PNS) product or a Special Weather Statement (SPS) product may be issued from AWIPS and/or disseminated on NWR to help minimize media/public concerns. A PNS may be more appropriate for earthquakes that are not felt by many in your CWA, but for widespread felt earthquakes across a CWA, the number of calls in the office will increase to where an SPS may be more appropriate. The PNS or SPS will reemphasize the information in the TIB or EQI product.

c. When the Tsunami Watch or Tsunami Warning is Cancelled:

If the WC/ATWC cancels the Tsunami Watch or Warning for your area, broadcast the information on NWR using the template in Appendix D. Additionally, a Cancellation Checklist is provided on page A-2 that lists tasks to be completed when a tsunami watch or warning has been cancelled.

A WFO's local policy to tone alert NWR cancellation messages must be collaborated with your partners. Note in your Station Duty Manual (SDM) if your office will tone alert NWR for cancelled tsunami watches or warnings.

3.2 Felt Earthquakes.

Anytime an earthquake is felt, WFOs may issue an Earthquake Report (EQR) product to inform surrounding offices and the public (see Directive 10-518, Section 4 for details on the EQR).

WFOs (and the public) may inform the National Earthquake Information Center (NEIC) and the United State Geological Survey (USGS) of a felt earthquake by filling out an Earthquake Report online at the USGS website:

http://pasadena.wr.usgs.gov/shake/cus/STORE/Xvral_06/ciim_form.html

4. Dissemination Tests for WFOs and RFCs.

Monthly dissemination tests will be conducted for tsunami products by WC/ATWC to ensure products are received by the NWS and its partners. WC/ATWC will disseminate a test TIB and/or test TSU product roughly once a month to WFOs, RFCs, the FAA and Federal and State Emergency Managers.

4.1 Tsunami Acknowledgement Message.

After receipt of the WC/ATWC tsunami test product(s) [normally the TSUAT1 product], WFOs and RFCs will respond immediately by disseminating a Tsunami Acknowledgement Message (TMA) from AWIPS, as specified below. The TMA product is received back at WC/ATWC to validate operation of the communication system.

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

Example of a TMA message sent to WC/ATWC:

SEUS42 KJAX 231410
TMAJAX

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)

\$\$

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

5. Procedures Used to Notify Southern Region Headquarters and the RFCs.

a. To Southern Region Headquarters (SRH) from WFO Melbourne. Anytime WC/ATWC issues a TSU or TIB product for Southern Region's area or the Atlantic Basin, WFO Melbourne 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 communications at WFO Melbourne are inoperative, WFO Tampa will call SRH.

b. To Southeast River Forecast Center (SERFC) from WFO Melbourne. WFO Melbourne will notify the SERFC when a Tsunami Warning or Tsunami Watch has been issued for the Alabama or Florida coasts. If an event occurs after normal

business hours, the Hydrologist-In-Charge (HIC) or Development and Operations Hydrologist (DOH) 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 Melbourne are inoperative, WFO Tampa will call SERFC.

- c. To Lower Mississippi River Forecast Center from WFO New Orleans.
In the event a tsunami warning or tsunami watch has been issued for the Louisiana or Mississippi areas, WFO New Orleans will notify the Lower Mississippi River Forecast Center (LMRFC). If an event occurs after normal business hours, WFO New Orleans will contact the LMRFC by using the same procedures utilized in the after-hours contacts of the LMRFC associated with Flash Flood Guidance. The LMRFC call list provided by the RFC for Flash Flood Guidance (FFG) will provide the appropriate numbers and order of priority to ensure that an RFC forecaster is contacted. Upon receipt of a call, LMRFC forecasters will use established office procedures to notify management of a tsunami.

If communications at WFO New Orleans are inoperative, WFO Mobile will call LMRFC.

- d. To West Gulf River Forecast Center (WGRFC) from WFO Houston.
WFO Houston will call the WGRFC HIC/DOH to notify them when a tsunami warning or tsunami watch has been issued for the Texas coast. If an event occurs after normal business hours, the HIC or DOH 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 Houston are inoperative, WFO Lake Charles will call WGRFC.

6. Drills.

Because earthquakes do not occur regularly, completion of drills are critical to maintaining operational proficiency. SR CONUS coastal WFOs should conduct at least one drill a year for the procedures of the tsunami program and will notify the SRH Tsunami Program Leader when the drill is completed by the staff members.

Appendix A:

Sample WFO Checklist to use when a Tsunami Watch or Warning is issued by WC/ATWC for Your Area.

TSUNAMI WARNING / WATCH

(circle one)

Criteria: By direction of the West Coast / Alaska Tsunami Warning Center.

Issued: Date _____ Time _____

Valid until: Date _____ Time _____

Initials of Warning Coordinator _____

Area Affected _____

**Time
Completed/Initial
s**

WATCH / WARNING CHECKLIST

_____/_____

Put the watch or warning 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.
- Fill in the blanks. This 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 3.1.a.3 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 WC/ATWC to CRS and also SPSs 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. Also contact the RFC.

**Time
Completed**

CANCELLATION CHECKLIST

- _____/_____
Put the cancellation on NWR as follows:
- Get a Cancellation Broadcast Template from Appendix D.
 - 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 place on the WCM's desk.
- _____/_____
Notify the MIC or the WCM if they are not on station.
- _____/_____
Gather pertinent documents and review evacuation/safety procedures if the office is threatened by the tsunami.

Appendix B:

CRS/NWR Broadcast Template for Tsunami Watch

Upon receipt of a **tsunami watch** product (TSUAT1) from the WC/ATWC 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 _____ (specify area), from _____ to _____, at _____ AM / PM _____ (time zone). 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 _____ (time zone).
- _____ (LOCATION) _____ AM / PM _____ (time zone).
- _____ (LOCATION) _____ AM / PM _____ (time zone).
- _____ (LOCATION) _____ AM / PM _____ (time zone).

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 _____ (time zone).

Once again, a TSUNAMI WATCH is in effect from _____ (location) to _____ in _____ (specify area) at _____ AM / PM _____ (time zone).

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 (your location) will continue to monitor the situation, and will provide updates on NOAA Weather Radio every hour or sooner as conditions warrant."

Appendix C: CRS/NWR Broadcast Template for Tsunami Warning

Upon receipt of a **tsunami warning** product (TSUAT1) from the WC/ATWC 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 _____ (specify area), from _____ to _____, at _____ AM / PM _____ (time zone). 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 _____ (time zone).
 _____ (LOCATION) _____ AM / PM _____ (time zone).
 _____ (LOCATION) _____ AM / PM _____ (time zone).
 _____ (LOCATION) _____ AM / PM _____ (time zone).

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 _____ (time zone).

Once again, a TSUNAMI WARNING is in effect from _____ (location) to _____ in _____ (specify area) at _____ AM / PM _____ (time zone).

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

Tsunamis are a series of waves generated by an undersea earthquake. This series of waves 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 on or near the beach in the TSUNAMI WARNING area should move to higher ground. Your National Weather Service Office in (your location) will continue to monitor the situation and will provide updates on NOAA Weather Radio every 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 WC/ATWC's tsunami warning product if he/she deems it appropriate.

Appendix D:

CRS/NWR Broadcast Template for Tsunami Cancellation

Upon receipt of a tsunami watch/warning **cancellation** product (TSUAT1) from the WC/ATWC 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 watch/warning checklist. Here is the message to fill out and read:

"The National Weather Service has canceled the TSUNAMI (WATCH / WARNING) for coastal areas in _____ (specify area), from _____ (location) to _____, at _____ AM / PM _____ time zone. The Tsunami Warning Center has determined that the tsunami danger for _____ (specify area) 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 (WATCH / WARNING) has been canceled for coastal areas in _____ (specify area), from _____ (location) to _____, at _____ AM / PM _____ time zone. The Tsunami Warning Center has determined that no tsunami danger exists for _____ (specify area). 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 _____ (specify location). Our normal NOAA Weather Radio broadcast cycle will resume shortly."

Appendix E: Product Examples from WC/ATWC

Example of a standard format Tsunami Warning/Watch (TSUAT1 product) issued by WC/ATWC:

WEXX20 PAAQ 172109
TSUAT1

BULLETIN

TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
409 PM EST FRI FEB 17 2006

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

...A TEST TSUNAMI WARNING IS IN EFFECT WHICH INCLUDES THE FLORIDA - GEORGIA - SOUTH CAROLINA AND NORTH CAROLINA COASTAL AREAS FROM FLAGLER BEACH FLORIDA TO CURRITUCK BEACH LIGHTHOUSE NORTH CAROLINA...

...AT THIS TIME THIS MESSAGE IS ADVISORY ONLY FOR U.S. AND CANADIAN ATLANTIC AND GULF OF MEXICO COASTAL REGIONS NOT INCLUDED IN THE WARNED AREA...

EVALUATION

IT IS NOT KNOWN - REPEAT NOT KNOWN - IF A TSUNAMI EXISTS BUT A TSUNAMI MAY HAVE BEEN GENERATED. THEREFORE PERSONS IN LOW LYING COASTAL AREAS SHOULD BE ALERT TO INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. PERSONS ON THE BEACH SHOULD MOVE TO HIGHER GROUND IF IN A WARNED AREA. TSUNAMIS MAY BE A SERIES OF WAVES WHICH COULD BE DANGEROUS FOR SEVERAL HOURS AFTER THE INITIAL WAVE ARRIVAL.

EARTHQUAKE DATA

PRELIMINARY MAGNITUDE - 7.2
LOCATION - 32.2N 78.9W
100 MILES S OF MYRTLE BEACH SOUTH CAROLINA
80 MILES SE OF CHARLESTON SOUTH CAROLINA
TIME - 1550 EST FEB 17 2006
1450 CST FEB 17 2006
2050 UTC FEB 17 2006

AMZ450-452-454-330-350-352-354-250-252-254-256-130-135-150-152-154-156-158-FLZ024-025-033-038-GAZ154-166-141-139-117-119-SCZ051-048>050-046-034-NCZ100-101-097-098-095-104-103-094-080-081-045>047-172209-

COASTAL AREAS BETWEEN AND INCLUDING FLAGLER BEACH FLORIDA TO CURRITUCK BEACH LIGHTHOUSE NORTH CAROLINA.

...A TEST TSUNAMI WARNING IS IN EFFECT WHICH INCLUDES THE FLORIDA - GEORGIA - SOUTH CAROLINA AND NORTH CAROLINA COASTAL AREAS FROM FLAGLER BEACH FLORIDA TO CURRITUCK BEACH LIGHTHOUSE NORTH CAROLINA...

ESTIMATED TIMES OF INITIAL WAVE ARRIVAL

CHARLESTON-SC	1746 EST FEB 17	JACKSONVILLE B-FL	1835 EST FEB 17
CAPE HATTERAS-NC	1749 EST FEB 17	SAVANNAH-GA	1930 EST FEB 17
MYRTLE BCH-SC	1826 EST FEB 17		

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GMZ130-150-155-235-230-250-255-330-335-350-355-455-450-555-550-630-655-650-750-755-830-856-853-850-657-656-032-075-052>054-AMZ630-650-651-550-555-ANZ630>633-650-652-654-656-658-530>534-537-430-431-450>455-330-335-338-350-353-355-230>237-250-254-255-150-050-081-TXZ251-256-257-242>247-236>238-213-214-215-216-LAZ051>054-066>070-040-062-064-MIZ080>082-ALZ061>064-FLZ002-004-006-008-012-014-015-027-018-028-034-039-042-048>051-055-060-062-065-069-070-075-073-074-072-068-076-064-059-054-047-147-141-NCZ030>032-015>017-102-VAZ082-089>091-093>096-098>100-084>086-074>078-MDZ021>025-014-018-017-011-007-012-015-019-008-DEZALL-NJZ016-020>026-012-013-NYZ006-071>081-CTZ009>012-RIZ002-005>007-MAZ019>024-016-007-NHZ014-MEZ022>028-029-030-172209-COASTAL AREAS FROM BROWNSVILLE TEXAS TO FLAGLER BEACH FLORIDA AND FROM CURRITUCK BEACH LIGHTHOUSE NORTH CAROLINA TO CAPE CHIDLEY LABRADOR.

...TSUNAMI ADVISORY STATEMENT...

NO - REPEAT NO - TSUNAMI WATCH OR WARNING IS IN EFFECT FOR THE COASTAL AREAS FROM BROWNSVILLE TEXAS TO FLAGLER BEACH FLORIDA AND FROM CURRITUCK BEACH LIGHTHOUSE NORTH CAROLINA TO CAPE CHIDLEY LABRADOR.

FOR INFORMATION ONLY - ESTIMATED TIMES OF INITIAL WAVE ARRIVAL

MELBOURNE-FL	1818 EST FEB 17	GRAND MANAN-NB	2124 EST FEB 17
MIAMI-FL	1820 EST FEB 17	PORTLAND-ME	2131 EST FEB 17
KEY WEST-FL	1920 EST FEB 17	BOSTON-MA	2204 EST FEB 17
MONTAUK-NY	1938 EST FEB 17	PANAMA CITY-FL	2113 CST FEB 17
VIRGINIA BCH-VA	1939 EST FEB 17	CORPUS CHRISTI-TX	2202 CST FEB 17
ATLANTIC CITY-NJ	1943 EST FEB 17	BONAVISTA-NF	2315 EST FEB 17
LOCKPORT-NS	2001 EST FEB 17	ST PETERSBURG-FL	2328 EST FEB 17
NANTUCKET ISLE-MA	2002 EST FEB 17	BILOXI-MS	2236 CST FEB 17
NEW YORK CITY-NY	2040 EST FEB 17	BATTLE HARBOUR-NL	2354 EST FEB 17
SCATARIE IS-NS	2112 EST FEB 17	GALVESTON-TX	2318 CST FEB 17
ST LAWRENCE-NF	2121 EST FEB 17		

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TSUNAMI WARNINGS ARE ISSUED DUE TO THE IMMINENT THREAT OF TSUNAMI. WARNINGS CAN BE BASED SOLELY ON SEISMIC INFORMATION... OR BASED ON CONFIRMATION THAT A POTENTIALLY DESTRUCTIVE WAVE HAS OCCURRED. COASTAL RESIDENTS IN THE WARNING AREA WHO ARE NEAR THE BEACH OR IN LOW-LYING REGIONS SHOULD MOVE IMMEDIATELY INLAND TO HIGHER GROUND.

MESSAGES WILL BE ISSUED HALF-HOURLY OR SOONER IF CONDITIONS WARRANT. THE TSUNAMI WARNING WILL REMAIN IN EFFECT UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION AND EXPECTED ARRIVAL TIMES.

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

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Appendix E - Continued: Product Examples from WC/ATWC

Example of a "Public Friendly" Tsunami Warning/Watch (TSUATE product) issued by WC/ATWC:

WEXX30 PAAQ 172109
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
409 PM EST FRI FEB 17 2006

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

...A TEST TSUNAMI WARNING IS IN EFFECT WHICH INCLUDES THE
FLORIDA - GEORGIA - SOUTH CAROLINA AND NORTH CAROLINA
COASTAL AREAS FROM FLAGLER BEACH FLORIDA TO CURRITUCK BEACH
LIGHTHOUSE NORTH CAROLINA...

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 EVACUATE IMMEDIATELY. HOMES AND SMALL BUILDINGS ARE NOT DESIGNED TO WITHSTAND TSUNAMI IMPACTS. DO NOT STAY IN THESE STRUCTURES.

ALL RESIDENTS WITHIN THE WARNED AREA SHOULD BE ALERT FOR INSTRUCTIONS BROADCAST FROM THEIR LOCAL CIVIL AUTHORITIES. THIS TSUNAMI WARNING IS BASED SOLELY ON EARTHQUAKE INFORMATION - THE TSUNAMI HAS NOT YET BEEN CONFIRMED.

AT 350 PM EASTERN STANDARD TIME ON FEBRUARY 17 AN EARTHQUAKE WITH PRELIMINARY MAGNITUDE 7.2 OCCURRED 100 MILES SOUTH OF MYRTLE BEACH SOUTH CAROLINA. THIS EARTHQUAKE MAY HAVE GENERATED A TSUNAMI. IF A TSUNAMI HAS BEEN GENERATED THE WAVES WILL FIRST REACH SOUTH SANTEE RIVER SOUTH CAROLINA AT 537 PM EST ON FEBRUARY 17. 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 PREDICT. 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.

ADDITIONAL MESSAGES WILL BE ISSUED HALF-HOURLY OR SOONER IF CONDITIONS WARRANT. THE TSUNAMI WARNING 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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Appendix E - Continued: Product Examples from WC/ATWC

**Example of a standard format Tsunami Information Statement (TIBAT1 product) issued
by WC/ATWC:**

WEXX22 PAAQ 172113
TIBAT1

TSUNAMI INFORMATION STATEMENT NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
413 PM EST FRI FEB 17 2006

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

...THIS TSUNAMI INFORMATION STATEMENT IS FOR THE U.S. ATLANTIC
AND GULF OF MEXICO COASTS AND EASTERN CANADA...

NO - REPEAT NO - WATCH OR WARNING IS IN EFFECT FOR U.S. ATLANTIC
AND GULF OF MEXICO STATES AND THE EASTERN CANADIAN PROVINCES.

EVALUATION

BASED ON EARTHQUAKE AND HISTORICAL TSUNAMI INFORMATION THE
EARTHQUAKE WAS NOT SUFFICIENT TO GENERATE A TSUNAMI DAMAGING TO
THE U.S. ATLANTIC... EASTERN CANADIAN OR GULF OF MEXICO COASTS.
SOME OF THESE AREAS MAY EXPERIENCE SMALL SEA LEVEL CHANGES.

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.

EARTHQUAKE DATA

PRELIMINARY MAGNITUDE - 6.8
LOCATION - 36.1N 13.2W
 - NORTH ATLANTIC OCEAN
TIME - 1550 EST FEB 17 2006
 1450 CST FEB 17 2006
 2050 UTC FEB 17 2006

THIS WILL BE THE ONLY STATEMENT ISSUED FOR THIS EVENT BY THE
WEST COAST AND ALASKA TSUNAMI WARNING CENTER UNLESS ADDITIONAL
INFORMATION BECOMES AVAILABLE. 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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Appendix E - Continued: Product Examples from WC/ATWC

Example of a Tsunami Seismic Information Statement (EQIAT1 product) issued by WC/ATWC:

SEXX60 PAAQ 172116
EQIAT1

TSUNAMI SEISMIC INFORMATION STATEMENT
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
416 PM EST FRI FEB 17 2006

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

...THIS IS AN INFORMATION STATEMENT...

EVALUATION

AN EARTHQUAKE HAS OCCURRED WITH A MAGNITUDE SUCH THAT A TSUNAMI
WILL NOT BE GENERATED. THIS WILL BE THE ONLY WC/ATWC MESSAGE
ISSUED FOR THIS EVENT.

EARTHQUAKE DATA

PRELIMINARY MAGNITUDE - 4.9
LOCATION - 39.5N 74.3W
 15 MILES NE OF ATLANTIC CITY NEW JERSEY
 55 MILES SE OF PHILADELPHIA PENNSYLVANIA
TIME - 1550 EST FEB 17 2006
 1450 CST FEB 17 2006
 2050 UTC FEB 17 2006

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

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

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Appendix F: Graphical Representation of Criteria

WC/ATWC Atlantic					
Area	East Coast US & Canada	East Coast Inland <500 km	Gulf Mex	Not AOR Caribbean	Not AOR Atlantic
Mag					
4	EQI	4	EQI		
5	SEXX60		SEXX60		
6	TIB WEXX22 and WEXX32	TIB WEXX22 and WEXX32	TIB WEXX22 and WEXX32	TIB WEXX22 and WEXX32	
6.7					TIB WEXX22 and WEXX32
6.8	Warning * 350km WEXX20 and WEXX30		Warning * Gulf only WEXX20 and WEXX30		
7.5					
7.6	Warning* 1000km WEXX20/30			TIB/ Warning Spec. area	TIB/ Warning Spec. area
7.8					WEXX22 / WEXX20 and WEXX32/ WEXX22
7.9	Warning 3W/3W WEXX20/ WEXX30				WEXX22 / WEXX20 and WEXX32/ WEXX22
10					

* No Watch