Exercise CARIBE WAVE/ LANTEX13

Participant Handbook

A Caribbean Tsunami Warning Exercise
March 20, 2013

UNESCO IOC Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean Sea and Adjacent Regions

US National Tsunami Hazard Mitigation Program
Warning Coordination Subcommittee

NOTE: The contents of this handbook are patterned after the Exercise PACIFIC WAVE 08 and CARIBE WAVE/LANTEX 11 handbooks published by the Intergovernmental Oceanographic Commission. Citations: *Exercise Pacific Wave 08. A Pacific-wide Tsunami Warning and Communication Exercise, 28-30 October 2008.* IOC Technical Series No. 82. Paris, UNESCO, 2008 and Exercise CARIBE WAVE 11. A Caribbean Tsunami Warning Exercise, 23 March 2011. IOC Technical Series No. 93. Paris, UNESCO, 2010.

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Summary

The Intergovernmental Coordination Group for Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS) of the United National Educational, Scientific, and Cultural Organization's (UNESCO) Intergovernmental Oceanographic Commission (IOC) and the US National Weather Service and National Tsunami Hazard Mitigation Program will be conducting a tsunami exercise on March 20, 2013. The purpose of this exercise is to assist tsunami preparedness efforts in the Caribbean and Adjacent regions, including U.S. and Canadian east coasts, the Gulf of Mexico and Bermuda. The CARIBE WAVE/LANTEX13 tsunami scenario simulates a tsunami generated by a M 8.5 earthquake originating 57 miles north of Oranjestad, Aruba in the Caribbean Sea. The initial dummy message will be issued by the Pacific and West Coast/Alaska Tsunami Warning Centers (PTWC/WCATWC) on March 20, 2013 at 1302 UTC and disseminated over all its standard broadcast channels. The dummy message is issued to test communications with Tsunami Warning Focal Points and Emergency Management Organizations, and to start the exercise. It will be the only exercise message broadcast from the PTWC/WCATWC, excluding special email messages. The manual includes the tsunami and earthquake scenario information, time lines, the PTWC/WCATWC exercise messages, a model press release and instructions for post exercise evaluation. The handbook also includes the scenario outputs of ShakeMap and the Prompt Assessment of Global Earthquakes for Response (PAGER) products provided by the United States Geological Survey (USGS). High levels of vulnerability and risk to life and livelihoods from tsunamis along the Caribbean and Adjacent regions, U.S. and Canadian east coasts, the Gulf of Mexico and Bermuda should provide a strong incentive for countries and local jurisdictions to prepare for a tsunami and participate in this exercise.

1. Background

This tsunami exercise is being conducted to assist tsunami preparedness efforts throughout the Caribbean region and northern Western Atlantic. Recent events, such as the 2004 Indian Ocean, 2009 Samoa, 2010 Haiti and Chile, and 2011 Japan earthquakes and tsunamis, attest to the importance of proper planning for tsunami response.

Historical tsunami records from sources such as the National Oceanic and Atmospheric Administration's (NOAA) National Geophysical Data Center (NGDC) show that over 75 tsunamis with validity greater than 1 have been observed in the Caribbean over the past 500 years (Figure 1). These represent approximately 7-10 % of the world's oceanic tsunamis. Earthquake, landslide, and volcanic tsunami sources have all impacted the region. Since 1842 at least 3,510 people have lost their lives to tsunamis in the Caribbean. In recent years, there has been an explosive population growth and influx of tourists along the Caribbean and Western Atlantic coasts increasing the tsunami vulnerability of the region. In addition to the tsunamis, the region also has a long history of destructive earthquakes. Historical records show that major earthquakes have struck the Caribbean region many times during the past 500 years. Within the region there are multiple fault segments and submarine

features that could be the source of earthquake and landslide generated tsunamis (Figure 2). The perimeter of the Caribbean plate is bordered by no fewer than four major plates (North America, South America, Nazca, and Cocos). Subduction occurs along the eastern and northeastern Atlantic margins of the Caribbean plate. Normal, transform and strike slip faulting characterize northern South America, eastern Central America, the Cayman Ridge and Trench and the northern plate boundary (Benz et al, 2011). With nearly 160 million people (Caribbean, Central America and Northern South America) now living in this tourist region and a major earthquake occurring about every 50 years, the question is not *if* another major tsunami will happen but *when* it happens will the region be prepared for the tsunami impact. The risks of major earthquakes in the Caribbean, and the possibility of a resulting tsunami, are real and should be taken seriously.

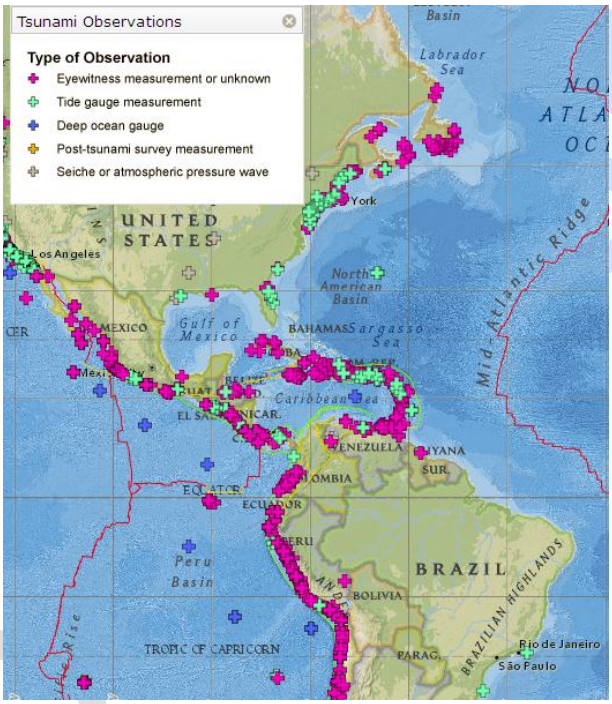

Figure 1. Map of tsunami runups in the Caribbean 1493-2010 (National Geophysical Data Center, http://www.ngdc.noaa.gov/hazards/tsu.shtml)

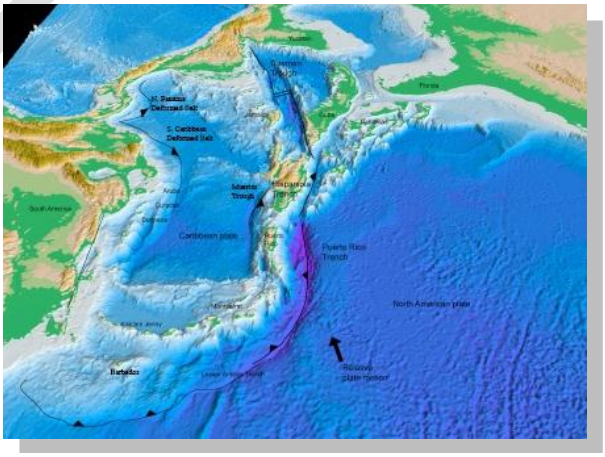

Figure 2. Tectonic features in the Caribbean (ten Brink et al., 2008).

Tsunami warning services for the Caribbean are currently provided by the West Coast/Alaska Tsunami Warning Center (WCATWC) in Palmer, Alaska for Puerto Rico and the US and British Virgin Islands (referred to as Virgin Islands), the US mainland and Canada while the Pacific Tsunami Warning Center (PTWC) in Ewa Beach, Hawaii is providing services for the other member states of the CARIBE EWS. These Centers issue tsunami products to the region approximately two to ten minutes after an earthquake's occurrence. The WCATWC products include warnings, advisories, watches, and information statements, while the PTWC products include tsunami information and watch messages. Primary recipients of Tsunami Warning Center (TWC) messages include national tsunami warning focal points, Weather Forecast Offices (WFO), national/state/territory warning points/emergency operation centers, national Coast Guards, and military contacts. These agencies disseminate the messages to people potentially impacted by a tsunami. The Puerto Rico Seismic Network (PRSN) of the University of Puerto Rico at Mayagüez, Instituto Nicaraguense de Estudios Territoriales (*INETER*) in Nicaragua, Fundación Venezolana de Investigaciones Sismológicas (FUNVISIS) in Venezuela, and other national and regional institutions also provide earthquake and tsunami alerts for their areas of responsibilities. Per recommendation of CARIBE EWS, as part of this exercise PTWC experimental products will also be distributed to the Tsunami National Contacts.

The United National Educational, Scientific, and Cultural Organization's (UNESCO) Intergovernmental Coordination Group for Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS), the Caribbean Emergency Management Agency (CDEMA), the Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (CEPREDENAC), NOAA, and the U.S. National Tsunami Hazard Mitigation Program (NTHMP) are providing the framework for this exercise as a means for emergency responders throughout the Caribbean to test and update tsunami response plans. High levels of vulnerability and threat in many Caribbean nations should provide a strong incentive for local jurisdictions to prepare for a tsunami.

This exercise will provide simulated tsunami warning and watch messages from the TWCs based on a hypothetical magnitude 8.5 earthquake located north of Venezuela, Aruba, Bonaire and Curacao (Figure 3). An evaluation of tsunami sources conducted by the USGS (ten Brink et al, 2008) considered the potential along the Evaluation of tsunami sources with the potential to impact the U.S. Atlantic and Gulf coasts, *USGS Administrative report to the U.S. Nuclear Regulatory Commission*, 300 pp.

Tsunami Exercises like this help ensure that Caribbean coasts are ready to respond in the event of a dangerous tsunami. Similar recent exercises in the Pacific, Indian, Mediterranean and Atlantic basins have proven effective in strengthening preparedness levels of emergency management organizations.

1.1 Earthquake Impact Scenario

For many countries, in addition to knowing the potential impact from the tsunami, it is also important to consider the potential earthquake impact. This is especially important for those in the near earthquake source. In consideration of this, the USGS provided for CARIBE WAVE/LANTEX 2013 the scenario outputs of their ShakeMap and the Prompt Assessment of Global Earthquakes for Response (PAGER) products. These results provide emergency responders, government, aid agencies and the media the scope of the potential earthquake related disaster. ShakeMap illustrates the ground shaking levels close to the earthquake source depending on a set of parameters like distance to the source, rock and soil behaviour and seismic wave propagation through the crust (http://earthquake.usgs.gov/research/shakemap/). PAGER is based on the earthquake shaking (via ShakeMap) and analyses of the population exposed to each level of shaking intensity with models of economic and fatality losses based on past earthquakes in each country or region of the world (http://earthquake.usgs.gov/research/pager/). For the CARIBE WAVE/LANTEX 2013 scenario the U. S. Geological Survey estimated that significant casualties and damage are likely from the earthquake itself which in themselves would require regional or national level response. The countries that would be most significantly affected by the earthquake are Aruba, Curacao and Venezuela. Complete information about the PAGER output for the exercise scenario is available in the Appendix C of the manual.

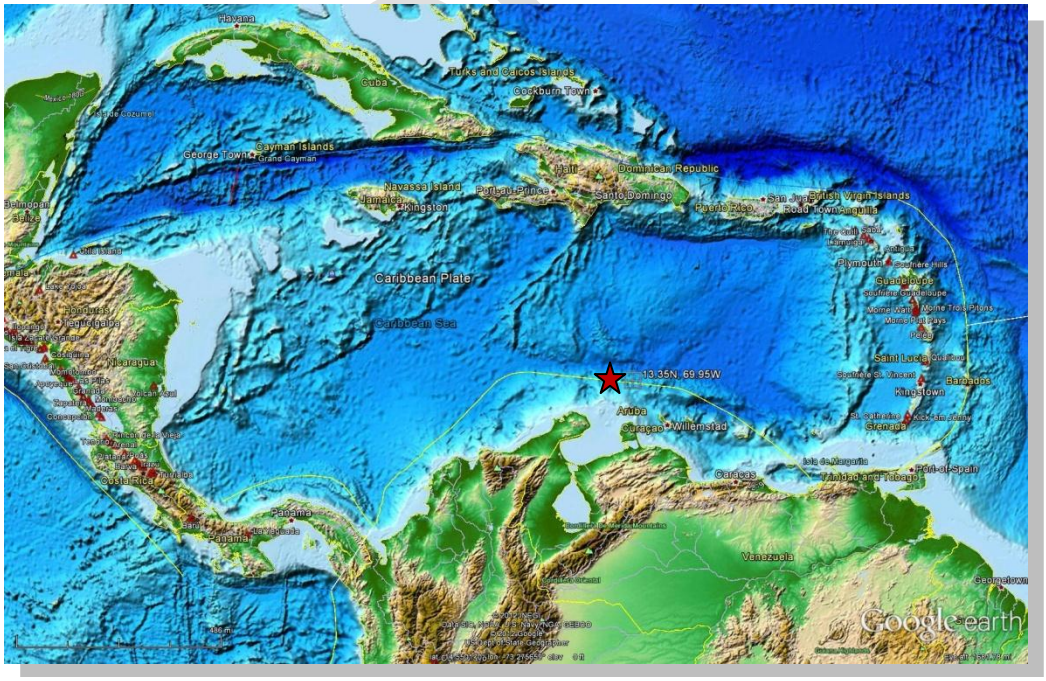

Figure 3. Caribe Wave 13/Lantex 13 earthquake epicenter location .

2. Exercise Concept

2.1 Purpose

The purpose of the exercise is to improve Tsunami Warning System effectiveness along the Caribbean coasts. The exercise provides an opportunity for emergency management organizations throughout the Caribbean to exercise their operational lines of communications, review their tsunami response procedures, and promote tsunami preparedness. Regular exercising of response plans is critical to maintain readiness for an emergency. This is particularly true for tsunamis, which are infrequent but high impact events. Every Caribbean emergency management organization (EMO) is encouraged to participate.

2.2 Objectives

Each organization can develop their objectives for the exercise depending on their level of involvement in the scenario. The following are the exercise's overarching objectives.

1. **To exercise and evaluate operations of the current Tsunami Warning System and in particular, the CARIBE EWS.**
    A. Validate the **issuance** of tsunami products from the PTWC and WCATWC.
    B. Validate the **receipt and dissemination** of tsunami products by CARIBE EWS Tsunami Warning Focal Points (TWFP).
2. **To begin a process of exposure to an initial test version of PTWC experimental products.**
    A. Review and evaluate PTWC experimental products that will be available in parallel with existing PTWC products.
    B. Provide feedback on the staging, format and content of the experimental products
3. **To validate the readiness to respond to a local/regional source tsunami.**
    A. Validate the operational readiness of the Tsunami Warning Focal Point (TWFP, or like function) and/or the National Disaster Management Office (NDMO).
    B. To improve operational readiness. Before the exercise, ensure appropriate tools and response plan(s) have been developed, including public education materials
    C. Validate dissemination of warnings and information/advice by Tsunami Warning Focal Points to relevant in-country agencies and the public is accurate and timely.
    D. Validate the organisational decision-making process (tsunami response plans) about public warnings and evacuations.
    E. Validate the methods used to notify and instruct the public are accurate and timely.

2.3 Type of Exercise

The exercise should be carried out such that communications and decision making at various organizational levels are exercised and conducted without disrupting or alarming the general public. Individual localities, however, may at their discretion elect to extend the exercise down to the level of testing local notification systems such as the Emergency Alert System (EAS), sirens, or loudspeakers.

The IOC has prepared a Manual *How To Plan, Conduct And Evaluate Tsunami Exercises.* This manual is the product of a Collaborative effort of the New Zealand Ministry of Civil Defense and Emergency Management, and the UNESCO/IOC-NOAA International Tsunami Information Centre, and is based on Exercise Guidelines developed by New Zealand (MCDEM, 2009). The draft versions in English and Spanish have been posted as support material for this exercise at http://www.srh.noaa.gov/srh/ctwp/.

Exercises stimulate the development, training, testing, and evaluation of Disaster Plans and Standard Operating Procedures. Exercise participants may use their own past multi-hazard drills (e.g. flood, hurricane, tsunami, earthquake, etc.) as a framework to conduct CARIBE WAVE/LANTEX 13.

Exercises can be conducted at various scales of magnitude and sophistication. The following are examples of types of exercises conducted by EMOs:

1. **Orientation Exercise (Seminar):** An Orientation Exercise lays the groundwork for a comprehensive exercise program. It is a planned event, developed to bring together individuals and officials with a role or interest in multi-hazard response planning, problem solving, development of standard operational procedures (SOPs), and resource integration and coordination. An Orientation Exercise will have a specific goal and written objectives and result in an agreed upon Plan of Action.

2. **Drill:** The Drill is a planned activity that tests, develops, and/or maintains skills in a single or limited emergency response procedure. Drills generally involve operational response of single departments or agencies. Drills can involve internal notifications and/or field activities.

3. **Tabletop Exercise:** The Tabletop Exercise is a planned activity in which local officials, key staff, and organizations with disaster management responsibilities are presented with simulated emergency situations. It is usually informal, in a conference room environment, and is designed to elicit constructive discussion from the participants. Participants will examine and attempt to resolve problems, based on plans and procedures, if they exist. Individuals are encouraged to discuss decisions in depth with emphasis on slow-paced problem solving, rather than rapid, real time decision-making. A Tabletop Exercise should have specific goals, objectives, and a scenario narrative (see Appendix A for a Sample Tabletop Exercise Outline).

4. **Functional Exercise:** A Functional Exercise is a planned activity designed to test and evaluate organizational capacities. It is also utilized to evaluate the capability of a community's emergency management system by testing the Emergency Operations Plan (EOP). It is based on a simulation of a realistic emergency situation that includes a description of the situation (narrative) with communications between players and simulators. The Functional Exercise gives the players (decision-makers) a fully simulated experience of being in a major disaster event. It should take place at the appropriate coordination location (i.e. emergency operations center, emergency command center, command post, master control center, etc.) and activate all the appropriate members designated by the plan. Both internal and external agencies (government, private sector, and volunteer agencies) should be involved. It requires players, controllers, simulators, and evaluators. Message traffic will be simulated and inserted by the control team for player response/actions, under real time constraints. It may or may not include public evacuations. A Functional Exercise should have specific goals, objectives, and a scenario narrative.

5. **Full-scale Exercise:** A Full-scale Exercise is the culmination of a progressive exercise program that has grown with the capacity of the community to conduct exercises. A Full-Scale exercise is a planned activity in a "challenging" environment that encompasses a majority of the emergency management functions. This type of exercise involves the actual mobilization and deployment of the appropriate personnel and resources needed to demonstrate operational capabilities. EOCs and other command centers are required to be activated. A Full-scale Exercise is the largest, costliest, and most complex exercise type. It may or may not include public evacuations.

Example Time Frames for Different Exercise Types

Style	Planning Period	Duration	Comments
Orientation Exercise	2 wks	1 day	Individual or mixed groups
Drill	2 days	1 day	Individual technical groups generally
Tabletop Exercise	2 weeks	1-3 days	Single or multiple agency
Functional Exercise	1-2 months	1-5 days	Multiple Agency participation
Full-scale Exercise	2-6 months	1 day/ week	Multiple Agency participation

3. Exercise Outline

3.1 General

Tsunami Warning and Watch messages for this exercise are issued by the WCATWC and PTWC based on a hypothetical earthquake with the following hypocenter parameters:

- Origin Time 13:00:00 UTC March 20, 2013
- Latitude 13.35°N
- Longitude 69.95°W
- Magnitude 8.5 – Mw
- Depth 10km

Expected tsunami impact for this event is determined from tsunami forecast models. The models indicate a significant tsunami in the eastern Caribbean with little impact outside the Caribbean. Based on the models, the exercise alert areas are limited to the Caribbean region, and do not include other TWC areas-of-responsibility in the Atlantic or Gulf of Mexico. Appendix B provides model results.

Initially, a tsunami warning is issued by WCATWC which includes Puerto Rico and the Virgin Islands, while PTWC issues a Regional Tsunami Watch. Definitions of the products that will be issued by the TWCs during this exercise are provided below (Note that PTWC products differ from WCATWC products due to different requirements for the international products of the ICG/CARIBE-EWS):

West Coast Alaska Tsunami Warning Center:

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.

Pacific Tsunami Warning Center:

Tsunami Watch – Watches are the highest level of alert issued by PTWC for the CARIBE-EWS. They are either based only on seismic information indicating a potential tsunami, or following confirmation that a tsunami with destructive potential is underway. The tsunami may be imminent, expected, or occurring. Watches alert the Tsunami Warning Focal Points of the CARIBE-EWS that dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after initial arrival. Watches alert authoritative officials to take action for threatened

coastal areas. Appropriate actions 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. Watches may be updated, adjusted geographically, downgraded, or cancelled. They are updated at least hourly to continue them, expand their coverage, upgrade them to a Warning, or end the alert.

Pacific Tsunami Warning Center New Products:

A suite of new products and procedures for the CARIBE-EWS is under development by PTWC and the ICG/CARIBE-EWS based upon PTWC real-time and database-driven forecast modelling capabilities. The new products will provide a number of advantages over the existing ones including greatly reducing the area of coast that is over-warned and providing the possibility of distinguishing between tsunami waves that present only a marine threat versus ones that present a coastal flooding threat versus ones that present an extreme flooding threat. The new products will include a text message similar to what is now issued with a slightly different content and format. It will still include information about areas under threat, expected tsunami arrival times, and selected measurements of tsunami waves. In addition to the text product, several graphical products will also be issued. These will include maps that show the pattern of tsunami energy crossing the ocean (similar to what is shown in figure B1 below, maps that show a comprehensive forecast of maximum tsunami amplitudes along threatened coasts, and a kmz file of the forecast that can be used in conjunction with GoogleEarth.

This exercise will give CARIBE-EWS Member States an opportunity to view and exercise with the new products if they choose to do so. They will be made available along with a more detailed description of their content and how they should be used at least a month before the exercise on the following website: http://www.caribewave.info

Staging of Messages

The TWCs will not issue live messages over broadcast dissemination channels other than to issue an initial dummy message to start the exercise at 1302 UTC on March 20, 2013. However, messages from the TWCs will be emailed to specific recipients who have registered to receive live dissemination throughout the event (http://www.prsn.uprm.edu/caribewave-lantex2013/registro). The content of the dummy message is given in Appendix D. The dummy message will indicate that exercise participants should refer to the first message provided in this handbook. From then on, participants should follow the schedule in Table 1 to look at new messages if they are not receiving them via email or another means. Table 1 is the timeline for when messages would be issued by the TWCs if this were a real event, and can be used by EMOs to drive the exercise timing. The warning messages (as shown in Appendix E and F) cover a 5-hour period, though in an actual event they would likely continue longer. World Meteorological Organization (WMO) and Advanced Weather Interactive Processing System (AWIPS) headers used in the dummy message are also listed in Table 2.

The WCATWC issues two official products each time a message is issued. The ones provided in Appendix E are known as the public message which does not

contain codes or text intended for automated systems. The public message format has been recently updated to a bulleted format. The other message not shown in Appendix E is the segmented message. This message includes encoded NWS zones, Valid Time Event Codes (VTEC), and their level of threat. The segmentation is used for automated processing systems which parse NWS products. WCATWC also issues additional graphical and web-based products to its web site. Examples of these are shown in Appendix E and G.

Participants may elect to exercise using their own timelines in order to achieve their particular objectives. For example, a particular EMO's Exercise Controller may choose to feed the TWC bulletins into the exercise at times of their own choosing, or alternatively put them in envelopes with the time they must be opened written on each, with each key participant agency having their own set of envelopes. The messages, provided in Appendix E and F, will facilitate this approach. For this exercise, in addition to the first dummy message, the WCATWC and the PTWC will email the messages to the participants who have registered for this service (http://www.prsn.uprm.edu/caribewave-lantex2013/registro).

EMOs are welcome to modify estimated arrival times and/or wave amplitudes to suit their exercise – for example, to have the tsunami arrive sooner and with larger amplitude. Other exercise injects, such as tsunami damage reports, are also encouraged.

3.2 Master Schedule (Exercise Script)

Tables 1 and 2 contain the scenario timeline for the exercise, as well as the product types that will be disseminated for this exercise by the Tsunami Warning Centers.

Table 1: Scenario Timeline. Time, product and dissemination Method for messages to be issued by the Tsunami Warning Centers.

Date (UTC)	Time (UTC)	WCATWC Message				PTWC Message			
		#	Type	Dummy	Email	#	Type	Dummy	Email
03/20/2013	1300		------Earthquake Occurs------						
03/20/2013	1302	01	Warn	Yes	Yes	01	Watch	Yes	Yes
	1330					02	Watch	No	Yes
03/20/2013	1337	02	Warn	No	Yes				
03/20/2013	1402	03	Warn	No	Yes				
	1420					03	Watch	No	Yes
03/20/2013	1432	04	Warn	No	Yes				
03/20/2013	1502	05	Warn	No	Yes				
	1515					04	Watch	No	Yes
03/20/2013	1604	06	Warn	No	Yes				
	1610					05	Watch	No	Yes
03/20/2013	1704	07	Warn	No	Yes				
	1710					06	Watch	No	Yes
03/20/2013	1803	08	Warn	No	Yes				
	1810					07	Watch	No	Yes
03/20/2013	1902	09	Can	No	Yes				
	1910					08	Can	No	Yes

The initial dummy message will be disseminated over all standard TWC broadcast channels as listed in Table 2. This is being issued to test communications with EMOs and Tsunami Warning Focal Points, and to start the exercise. All messages will be disseminated over a special email list to provide the messages in real time to organizations requesting this service. To receive the emails from the TWC's during the exercise, please register organization name and email address at http://www.prsn.uprm.edu/caribewave-lantex2013/registro by Monday, March 18, 2013. ***Please note that the WCATWC Dummy message is being issued with the WMO ID WEXX30 PAAQ and AWIPS ID TSUATE which is different than in previous exercises.***

TWC Message Types:

Warn	Tsunami Warning
Watch	Tsunami Watch
Can	Cancellation

Dummy:

Yes	Dummy Issued
No	Dummy Not Issued

Email:

Yes	Message disseminated via special email list
No	Message not disseminated via special email list

Table 2: Product Types. Product headers for Dummy Message with Transmission Methods for each Tsunami Warning Center.

Center	WMO ID	AWIPS ID	NWWS	AFTN	GTS	EMWIN	Fax	Email
WCATWC	WEXX30 PAAQ	TSUATE	Yes	Yes	Yes	Yes	Yes	Yes
PTWC	WECA41 PHEB	TSUCAX	Yes	Yes	Yes	Yes	Yes	Yes

NWWS	NOAA Weather Wire Service
GTS	Global Telecommunications System
EMWIN	Emergency Manager's Weather Information Network

3.3 Actions in Case of a Real Event

In the case of a real event occurring during the exercise, the TWCs will issue their normal messages for the event. Such messages will be given full priority and a decision will be made by the TWCs whether to issue the dummy message and to send email messages to registered recipients (http://www.prsn.uprm.edu/caribewave-lantex2013/registro). Smaller earthquakes that only trigger a Tsunami Information Statement will not disrupt the exercise. All documentation and correspondence relating to this exercise is to be clearly identified as "**CARIBE WAVE 13/LANTEX 13"** and "**Exercise**."

3.4 Procedure for False Alarm

Any time disaster response exercises are conducted, the potential exists for the public or media to interpret the event as real. Procedures should be set up by all participating entities to address public or media concerns involving this exercise in case of mis-interpretation by media or the public.

3.5 Resources

Although EMOs will have advance notice of the exercise and may elect to stand up a special dedicated shift to allow normal core business to continue uninterrupted, it is requested that realistic resource levels be deployed in order to reflect some of the issues that are likely to be faced in a real event.

Questions on the exercise can be addressed to:

Person	Telephone #	Email
Christa von Hillebrandt-Andrade, CARIBE EWS Chair and CTWP Manager	787-249-8307	christa.vonh@noaa.gov
Victor Cano, CARIBE EWS Vice Chair	58-212-2575153	vcano@funvisis.gob.ve
Philippe Sarron CARIBE EWS Vice Chair		philippe.sarron@martinique.pref.gouv.fr
Dawn French, CARIBE EWS Vice Chair		director@nemo.gov.lc
Emilio Talavera, Chair CARIBE EWS WG1	505-22492761	emilio.talavera@gf.ineter.gob.ni
Narcisse Zahibo, Chair CARIBE EWS WG2		narcisse.zahibo@univ-ag.fr
Elizabeth Klute, Chair CARIBE EWS WG3		elizabeth.klute@gmail.com
Kerry Hinds, Chair CARIBE EWS WG4	504-2290606 x401	kerry.hinds@gmail.com
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CTIC Director		
Laura Kong, ITIC Director		laura.kong@noaa.gov
Jeremy Collymore, Executive Director CDEMA	246-425-0386	Jeremy.Collymore@cdema.org
Ivan Morales, CEPREDENAC	502-2362-1981-83	imorales@sica.int
Melinda Bailey, NWS Southern Region	817-978-1100x107	melinda.bailey@noaa.gov
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Paul Whitmore WCATWC Director	907-745-4212	paul.whitmore@noaa.gov
James Waddell WCATWC Rep.	907-745-4212	james.waddell@noaa.gov
Charles McCreery PTWC Director	808-689-8207	charles.mccreery@noaa.gov
Gerard Fryer PTWC Rep.	808-689-8207	gerard.fryer@noaa.gov
Victor Huerfano PRSN Interim Director	787-833-8433	victor@prsn.uprm.edu

3.6 Media Arrangements

One advantage in conducting exercises is that it provides a venue to promote awareness of the exercise topic. Many residents along the Caribbean coasts may not realize that a tsunami warning system exists for their region, let alone the proper response. Communities may wish to invite their local media to the exercise to promote local awareness of the tsunami hazard. For all levels of exercising but especially for those countries executing full-scale and functional exercises, the media can also provide support in building awareness leading up to the Exercise. The media should be provided with available informational brochures prepared by the local, regional and international agencies. It is also a good opportunity to distribute the PRSN Tsunami Media Guide (http://www.prsn.uprm.edu/mediakit/), as well as the Seismic Research Unit Tsunami and other Coastal Hazards WS Media Information Kit (http://www.uwiseismic.com) as additional guidance. Appendix G contains a sample press release which can be adapted as necessary.

4 Post-Exercise Evaluation

All participating agencies are requested to provide brief feedback on the exercise. This feedback will assist the ICG/CARIBE-EWS, NTHMP, and NOAA in the evaluation of CARIBE WAVE 13/LANTEX 13 and the development of subsequent exercises, and help response agencies document lessons learned. The questions of for the evaluation are contained in Appendix I.

The CaribeWave/Lantex 2013 Evaluation Form to be filled out and submitted by **April 1, 2013** by the officially designated national/state and territorial authorities can be found at: https://www.surveymonkey.com/s/caribewave13_eval

5 References

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Appendix A. Example Table Top Exercise

Tabletop Exercise Development Steps

Source: California Office of Emergency Services

A Tabletop Exercise is a planned activity in which local officials, key staff, and organizations with disaster management responsibilities are presented with simulated emergency situations. It is usually informal and slow paced, in a conference room environment, and is designed to elicit constructive discussion from the participants to assess plans, policies, and procedures. Participants will examine and attempt to resolve problems, based on plans and procedures, if they exist. Individuals are encouraged to discuss decisions in depth based on their organization's Standard Operating Procedures (SOPs), with emphasis on slow-paced problem solving, rather than rapid, real time decision-making. An Exercise Controller (moderator) introduces a simulated tsunami scenario to participants via written message, simulated telephone or radio call, or by other means. Exercise problems and activities (injects) are further introduced. Participants conduct group discussions where resolution is generally agreed upon and then summarized by a group leader. A Tabletop Exercise should have specific goals, objectives, and a scenario narrative.

The following provides a Tabletop Exercise structure with sample text and example.

1. Vulnerability Analysis: Problem Statement

An example for a hurricane might be:
Due to the recent Hurricane incidents that the Southeast region of the United States, an awareness of the threat risk involved in these disasters has become more apparent, therefore the need for evacuation system is vital. The state of Louisiana continues its ongoing tasks of planning, preparing, and training for Hurricane preparedness.

2. Purpose (Mission): Intent, what you plan to accomplish (Policy Statement)

An example for a hurricane might be:
The State of Louisiana has realized and recognizes the need for a more efficient and effective evacuation system, and is responding with this Comprehensive Exercise Plan. These events will include seminars, workshops, a tabletop exercise, functional and full-scale exercises within an 18-month time frame, under the State Homeland Security grant program.

3. Scope: Exercise Activities
Agencies Involved
Hazard Type
Geographic Impact Area

An example might be:
Emergency Services coordinators at local levels of government will identify representative jurisdictions from each of the six mutual aid regions located throughout the State to participate as host jurisdictions in a series of disaster preparedness exercises. These host jurisdictions will develop a progressive series of exercises each type building upon the previous type of exercise. The process will begin with a vulnerability analysis for each jurisdiction and continue through a progression of exercise activities including: orientation seminars, workshops, and tabletop and functional exercises. The eventual objective of these activities will be to reduce disaster impacts to their populations and city infrastructure. All events will be evaluated utilizing US

Homeland Security Exercise Evaluation Program (HSEEP) after action reporting (AAR) standards. Steps for corrective actions will be made a part of the after action process and report. Surrounding jurisdictions in the mutual aid area will act as exercise design team members, exercise evaluators, or exercise observers for the purpose of information transfer to increase their operational readiness. Jurisdictions will participate on a rotational basis every two years to provide the opportunity for multiple jurisdiction participation.

4. Goals and Objectives:

Criteria for good objectives: Think SMART

- Simple (concise)
- Measurable
- Achievable (can this be done during the exercise?)
- Realistic (and challenging)
- Task Oriented (oriented to functions)

An example might be:

Comprehensive Exercise Program (CEP) Objectives

- *To improve operational readiness*
- *To improve multi-agency coordination and response capabilities for effective disaster response*
- *To identify communication pathways and problem areas pre-event between local jurisdictions and operational area, regional and state emergency operations centers*
- *To establish uniform methods for resource ordering, tracking, and supply for agencies involved at all levels of government.*

5. Narrative:

The Narrative should describe the following:

- Triggering emergency/disaster event
- Describe the environment at the time the exercise begins
- Provide necessary background information
- Prepare participants for the exercise
- Discovery, report: how do you find out?
- Advance notice?
- Time, location, extent or level of damage

6. Evaluation:

The Evaluation should describe the following:

- Objectives Based
- Train Evaluation Teams
- Develop Evaluation Forms

7. After Action Report (AAR): The AAR should be compiled using the evaluation reports

8. Improvement Plan (IP): The IP should reduce vulnerabilities.

Appendix B. Scenario Description

The objective of this exercise is to simulate an event which impacts a large portion of the Caribbean region and reflects a possible scenario.

The earthquake hypocenter parameters are:

- Origin Time 13:00:00 UTC March 20, 2013
- Latitude 13.35^{o}N
- Longitude 69.95^{o}W
- Magnitude 8.5 – Mw
- Depth 10km

The fault parameters used for determining the tsunami inundation and earthquake impact are:

- Fault rupture length 300 km
- Fault rupture width 100 km
- Dip 17^{o}

This scenario is based on tsunami sources included in the NOAA Pacific Marine Environmental Laboratory SIFT data base for the Caribbean. In 2008, ten Brink and others, as part of their evaluation of tsunami sources with the potential to impact the US Atlantic and Gulf Coasts considered this Southern Caribbean convergence zone. For this scenario the easternmost portion of this convergence zone was chosen and can be considered a worst case scenario for this area.

Tsunami models were computed using the Short-term Inundation Forecasting of Tsunamis (SIFT), Alaska Tsunami Forecast Model (ATFM), and Rapid Inundation Forecasting of Tsunamis (RIFT) model to generate expected impacts throughout the region. The models indicated a significant tsunami in the eastern Caribbean with little impact outside the Caribbean.

Sea floor displacement formulae were used to generate the uplift, and the models computed tsunami propagation from the source to produce forecast tsunami heights throughout the Caribbean as well as along the U.S. Atlantic and Gulf of Mexico coasts. Sample model outputs are shown in the Figures B1 through B6 with forecast maximum heights above sea level provided in the Table B1. Note that the highest tsunami elevation reached on the shore could be double that of the model outputs since model outputs are determined at the coast.

Figures B7 – B11 illustrate the tsunami coverage at 1, 2, 3, 4 and 6 hours using the coarse grids.

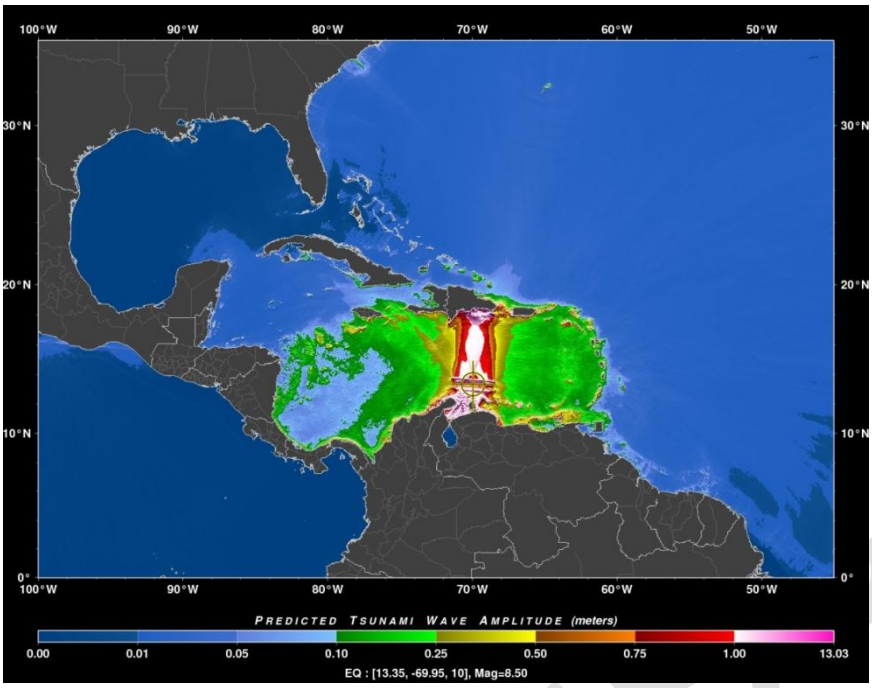


Figure B1. Maximum tsunami heights produced by RIFT (PTWC). Model results show a strong directivity towards the Dominican Republic.

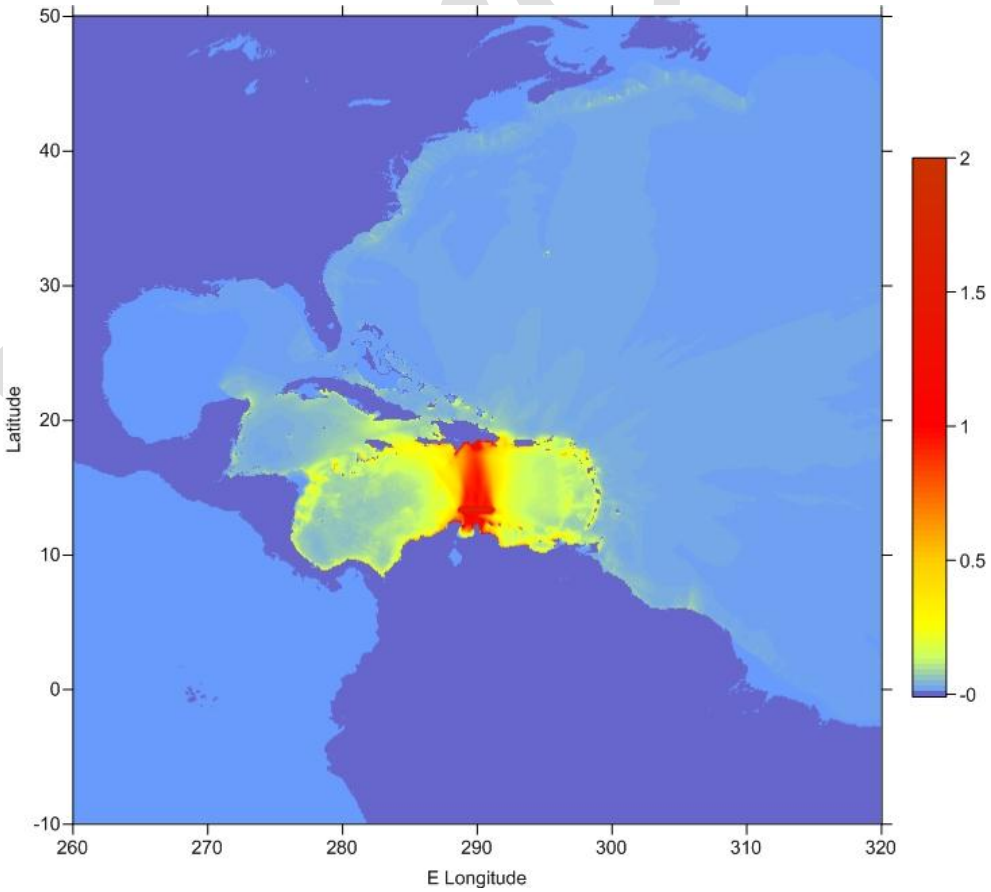


Figure B2. Maximum modeled tsunami heights throughout the Caribbean (scale in meters – ATFM-WCATWC). Model results again show a strong directivity towards the Dominican Republic.

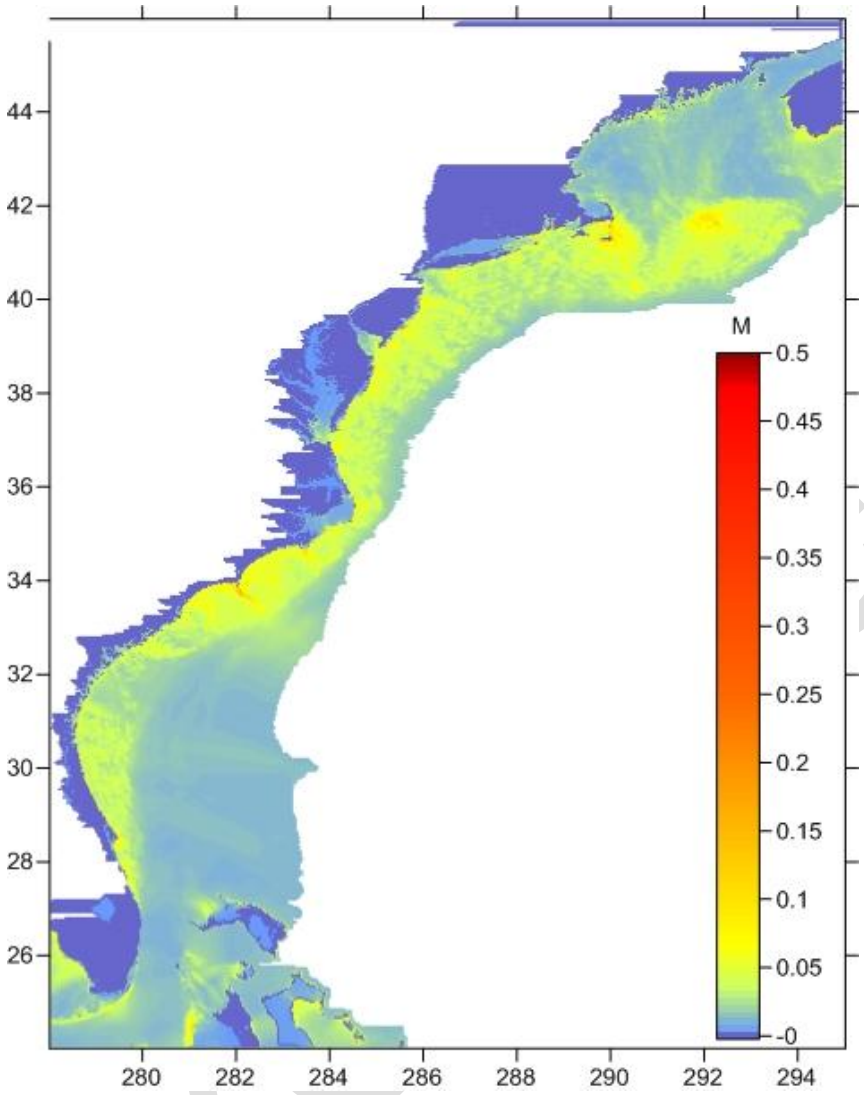


Figure B3. Maximum modeled tsunami amplitude in the fine grids near the U.S. Atlantic coast (scale in meters - ATFM). Model results show no significant tsunami recorded along the U.S. east coast.

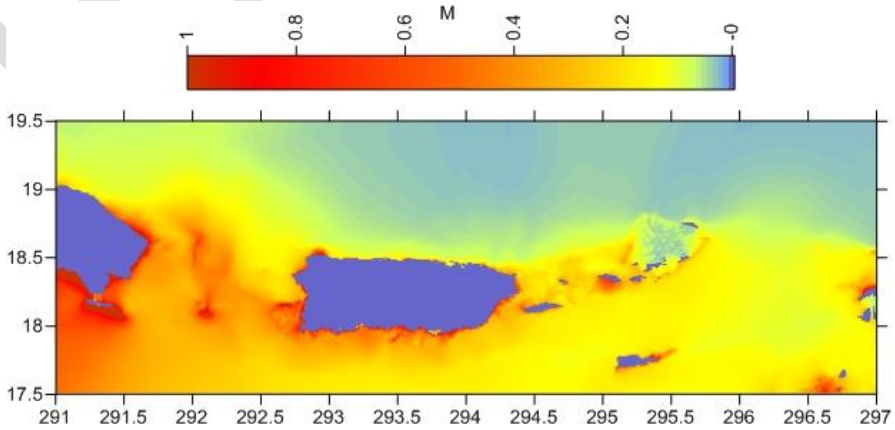


Figure B4. Maximum modeled tsunami heights in the fine grids near Puerto Rico and the US and British Virgin Islands (scale in meters - ATFM). Model results show a significant tsunami impacts in this area.

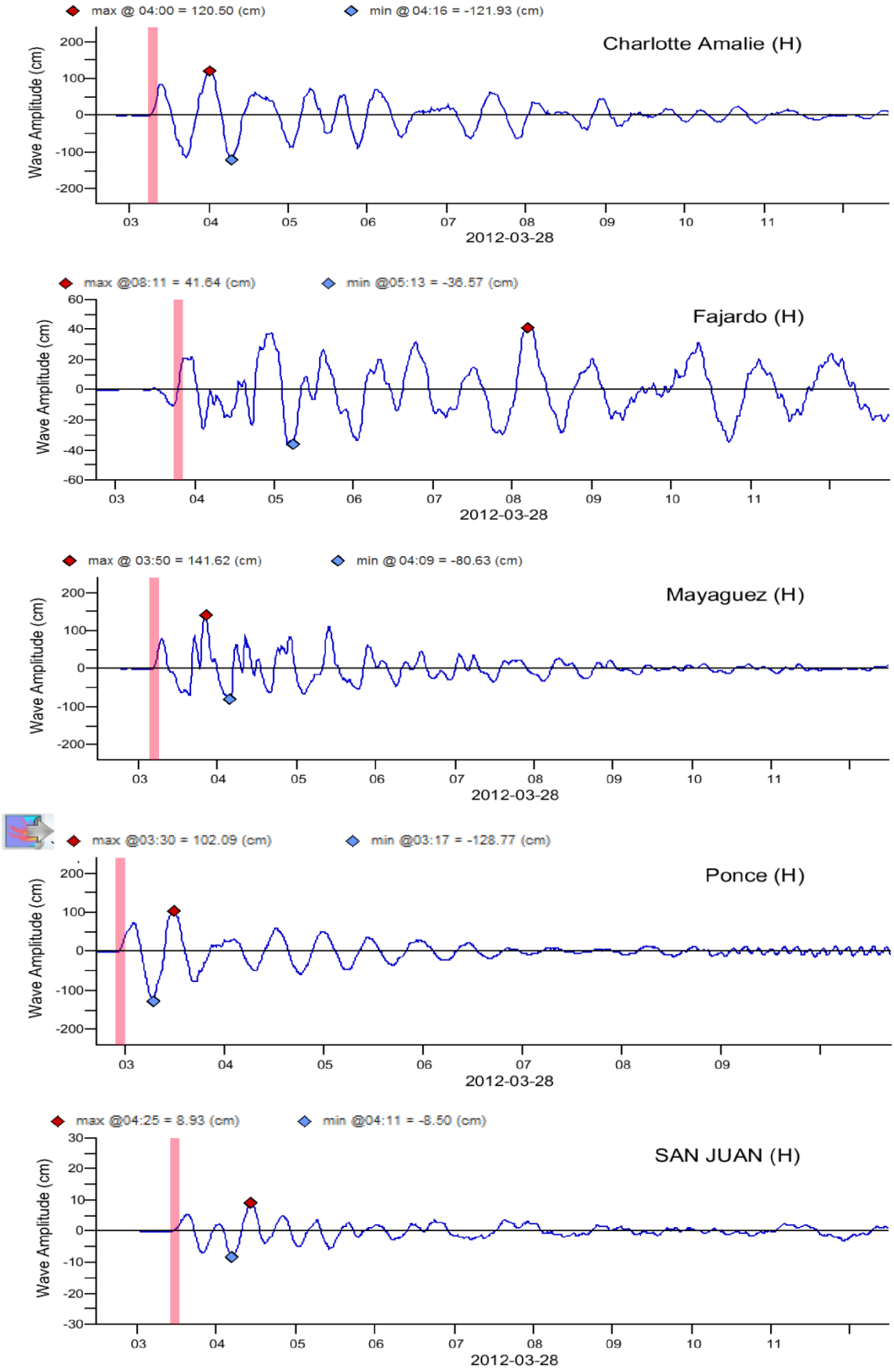
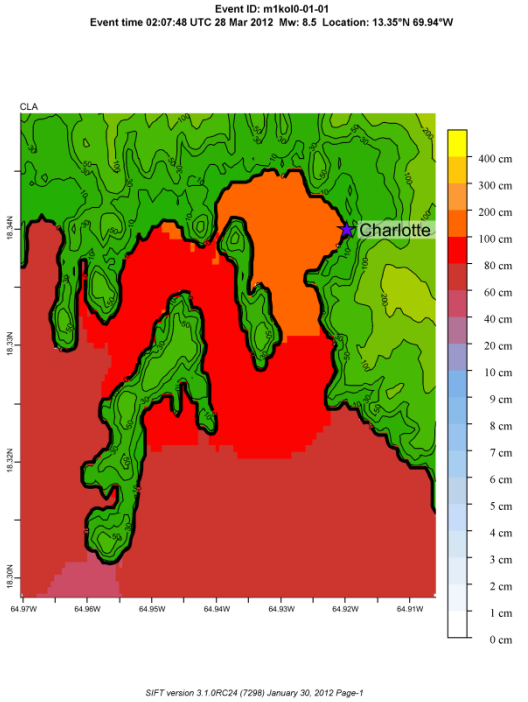
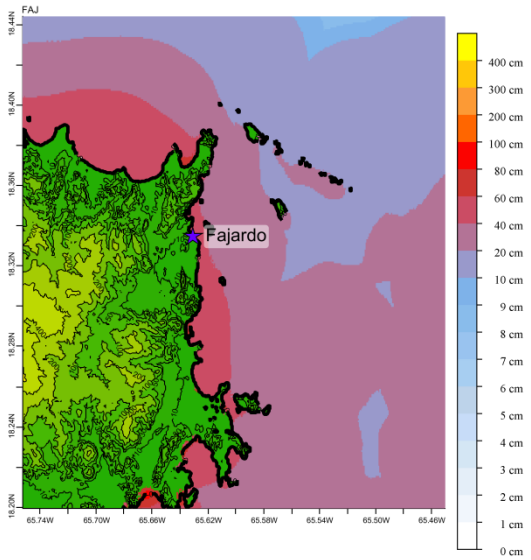


Figure B5. Tsunami variations over time at selected sites in Puerto Rico and the US Virgin Islands from the SIFT model.



SIFT version 3.1.0RC24 (7298) January 30, 2012 Page-1



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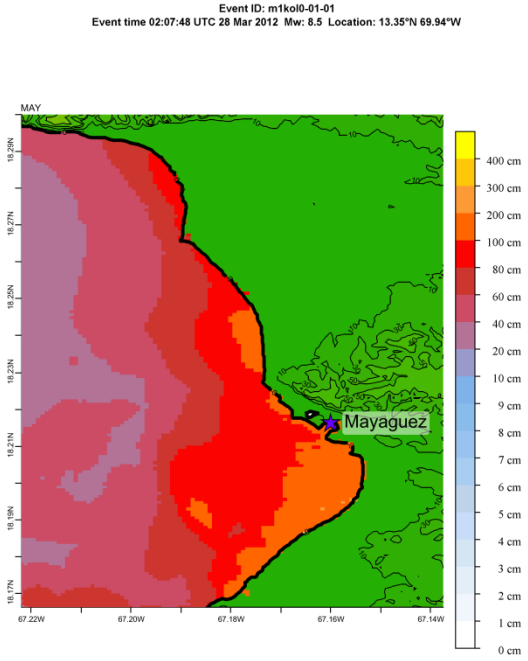

SIFT version 3.1.0RC24 (7298) January 30, 2012 Page-1

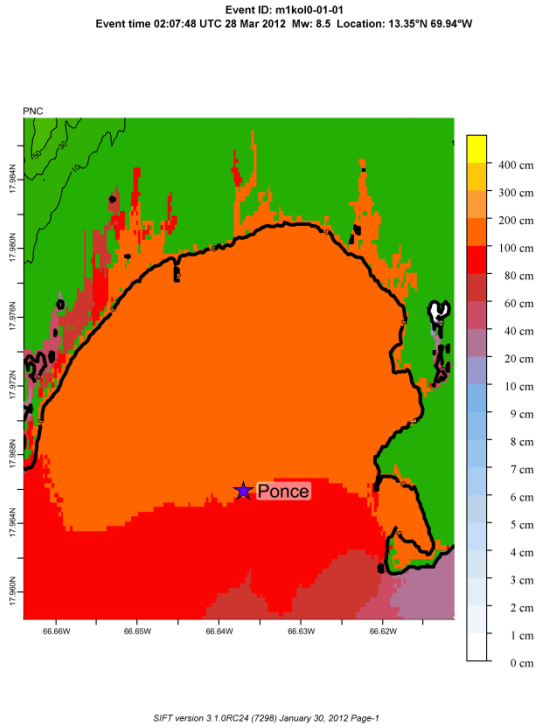

Figure B6. Tsunami inundation computed at selected sites in Puerto Rico and the US Virgin Islands by the SIFT model. Note that the Ponce region shows significant flooding.

Location	Travel Time (hr:min)	Max Tsunami Height (Water Level Above Predicted Tide)	Leading Edge
DART 42407	0:18	0.92 FT/0.28 M	elevation
D41421	1:48	0.07 FT/0.02 M	elevation
LAMESHUR BAY VI	1:59	1.91 FT/0.58 M	recession
PENUELAS PR	2:02	3.63 FT/1.11 M	elevation
YABUCOA PR	2:41	3.07 FT/0.94 M	elevation
D41420	2:48	0.08 FT/0.02 M	elevation
ESPERANZA VIEQUES ISLAND PR	2:55	1.76 FT/0.54 M	elevation
SAN JUAN PR	2:57	0.82 FT/0.25 M	recession
D41424	3:03	0.04 FT/0.01 M	elevation
SAN JUAN PR	3:19	0.97 FT/0.29 M	elevation
CHARLOTTE AMALIE VI	3:37	3.00 FT/0.91 M	elevation
D42402	3:58	0.04 FT/0.01 M	elevation
D44401	4:15	0.03 FT/0.01 M	elevation
KEY WEST FL	5:39	0.34 FT/0.10 M	elevation
MAYAGUEZ PR	6:12	2.07 FT/0.63 M	elevation
SANDY HOOK NJ	7:07	0.03 FT/0.01 M	elevation
ATLANTIC CITY NJ	7:52	0.35 FT/0.11 M	elevation
SANDY HOOK NJ	8:32	0.09 FT/0.03 M	elevation
BAR HARBOR ME	8:56	0.11 FT/0.03 M	elevation
WELLS ME	9:01	0.07 FT/0.02 M	recession
OCEAN CITY NJ	9:13	0.23 FT/0.07 M	elevation
SOUTH SANTEE SC	9:41	0.19 FT/0.06 M	elevation
NANTUCKET MA	9:59	0.20 FT/0.06 M	elevation
WELLS ME	10:27	0.16 FT/0.05 M	elevation
DUCK NC	10:57	0.21 FT/0.06 M	elevation
PORTLAND ME	11:16	0.13 FT/0.04 M	elevation
BOSTON MA	11:35	0.09 FT/0.03 M	elevation
SURF CITY NC	11:44	0.16 FT/0.05 M	elevation

Table B1: Coastal tsunami height forecast in Puerto Rico, USVI, and the United States mainland (WCATWC ATFM model). The height is the elevation of the tsunami above sea level. The height does not take into account uplift or subsidence of the location due to the earthquake. The height is forecasted for the point as close as possible to the original shoreline; the onshore heights (runup) may be 2 times as large. Only coastal forecast points for which the WCATWC has high resolution digital elevation models available are included in this list.

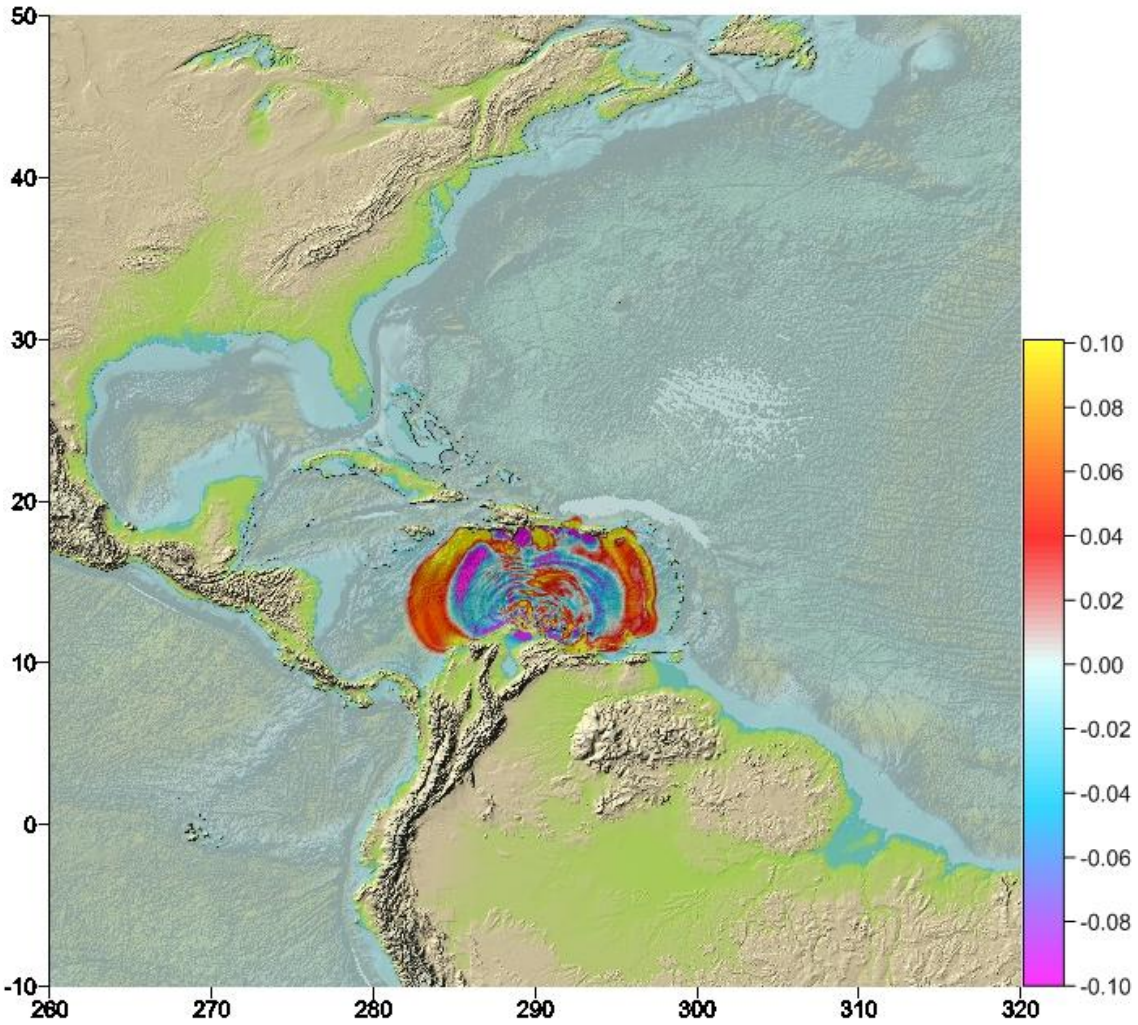

Figure B7. Tsunami at one hour according to ATFM Model (scale in meters).

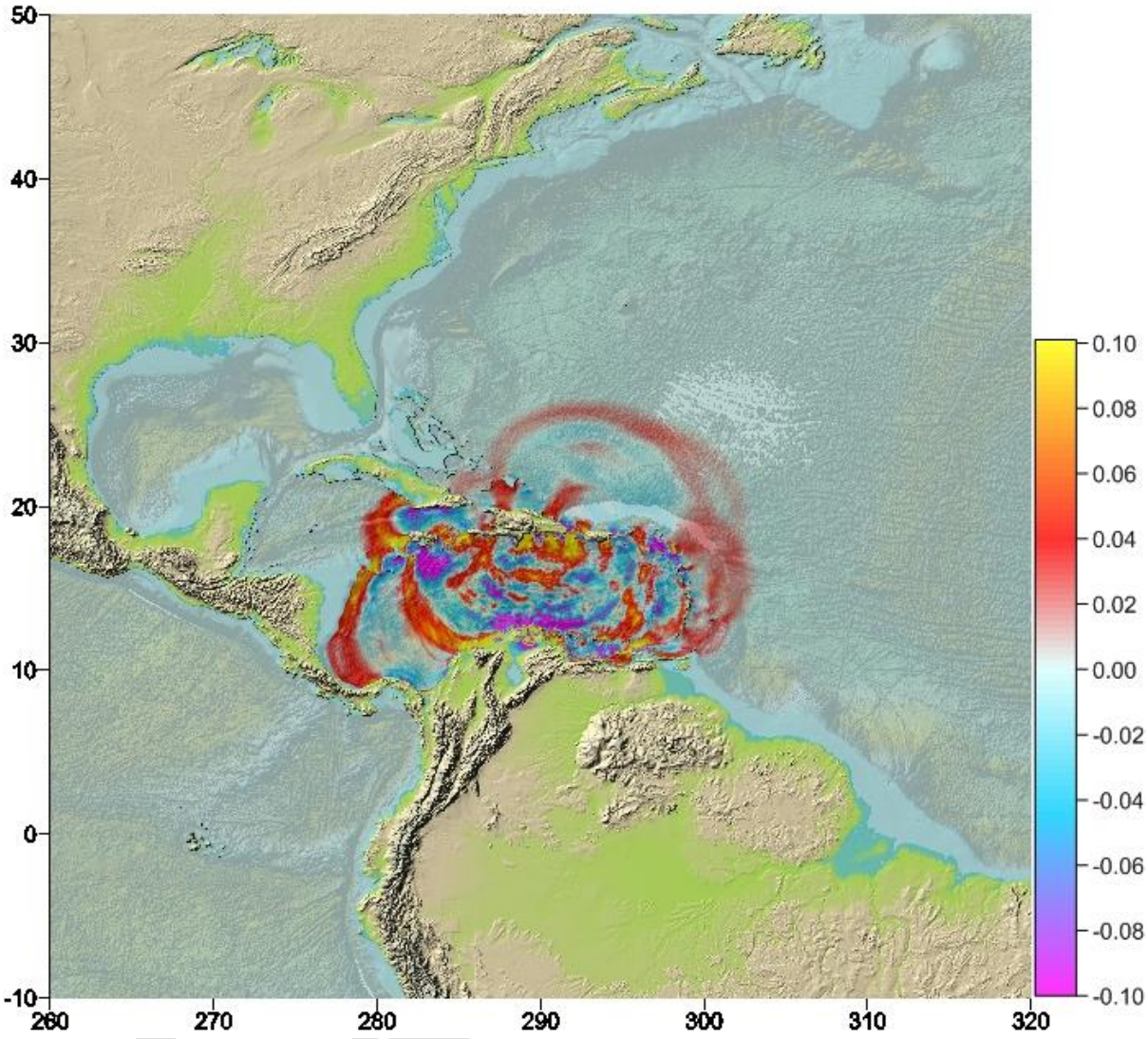

Figure B8. Tsunami at two hours according to ATFM Model (scale in meters).

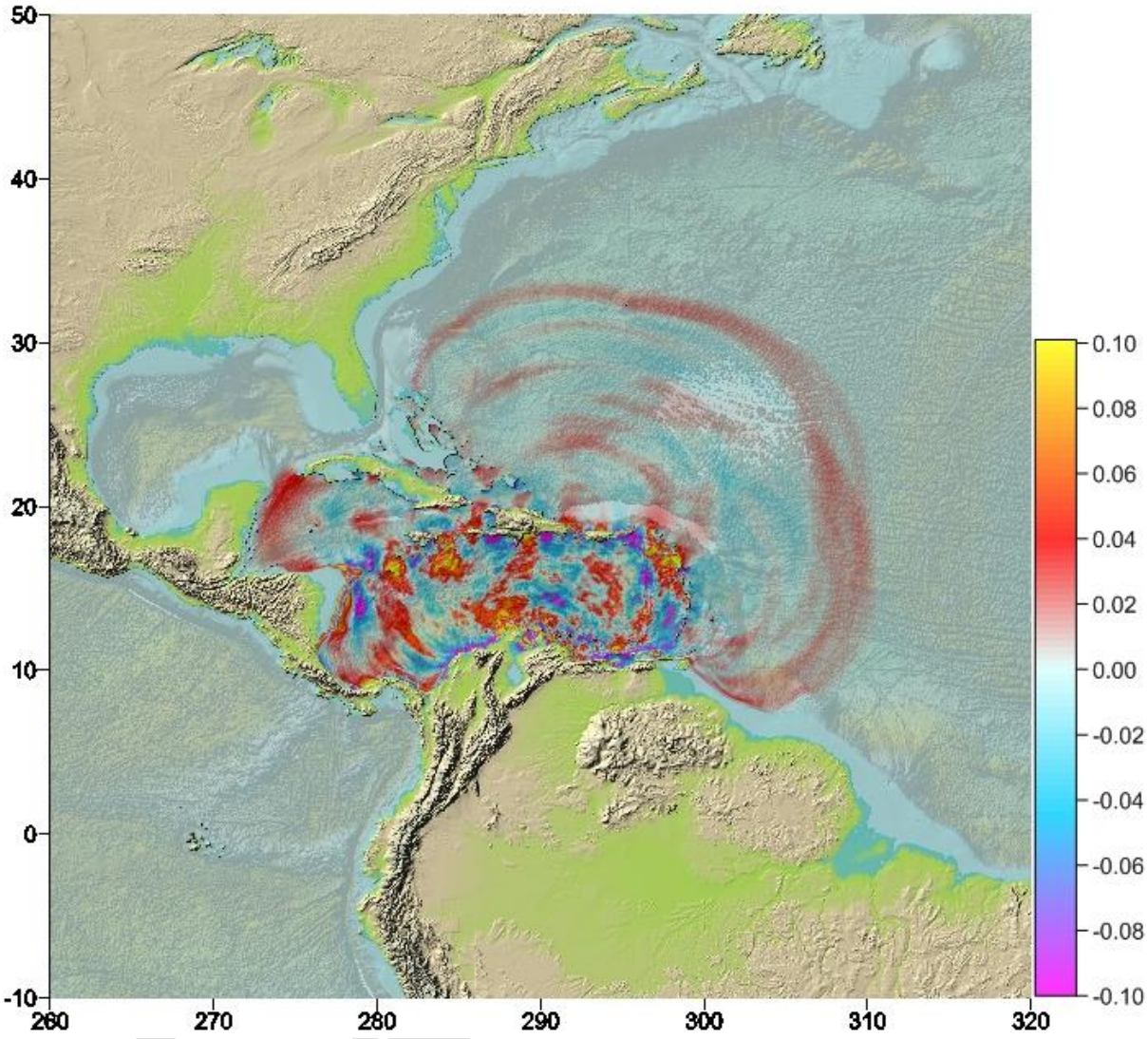

Figure B9. Tsunami at three hours according to ATFM Model (scale in meters).

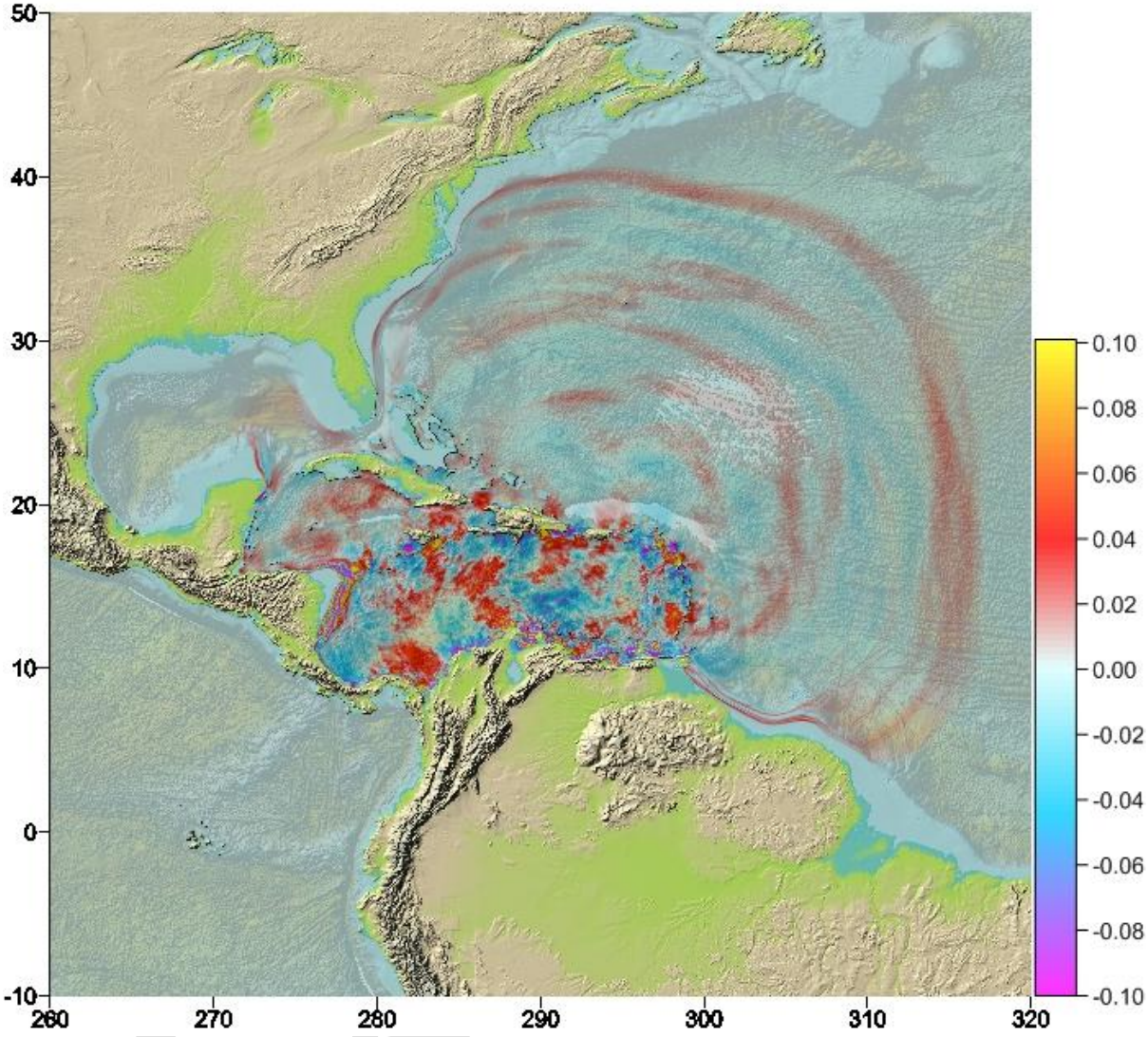

Figure B10. Tsunami at four hours according to ATFM Model (scale in meters).

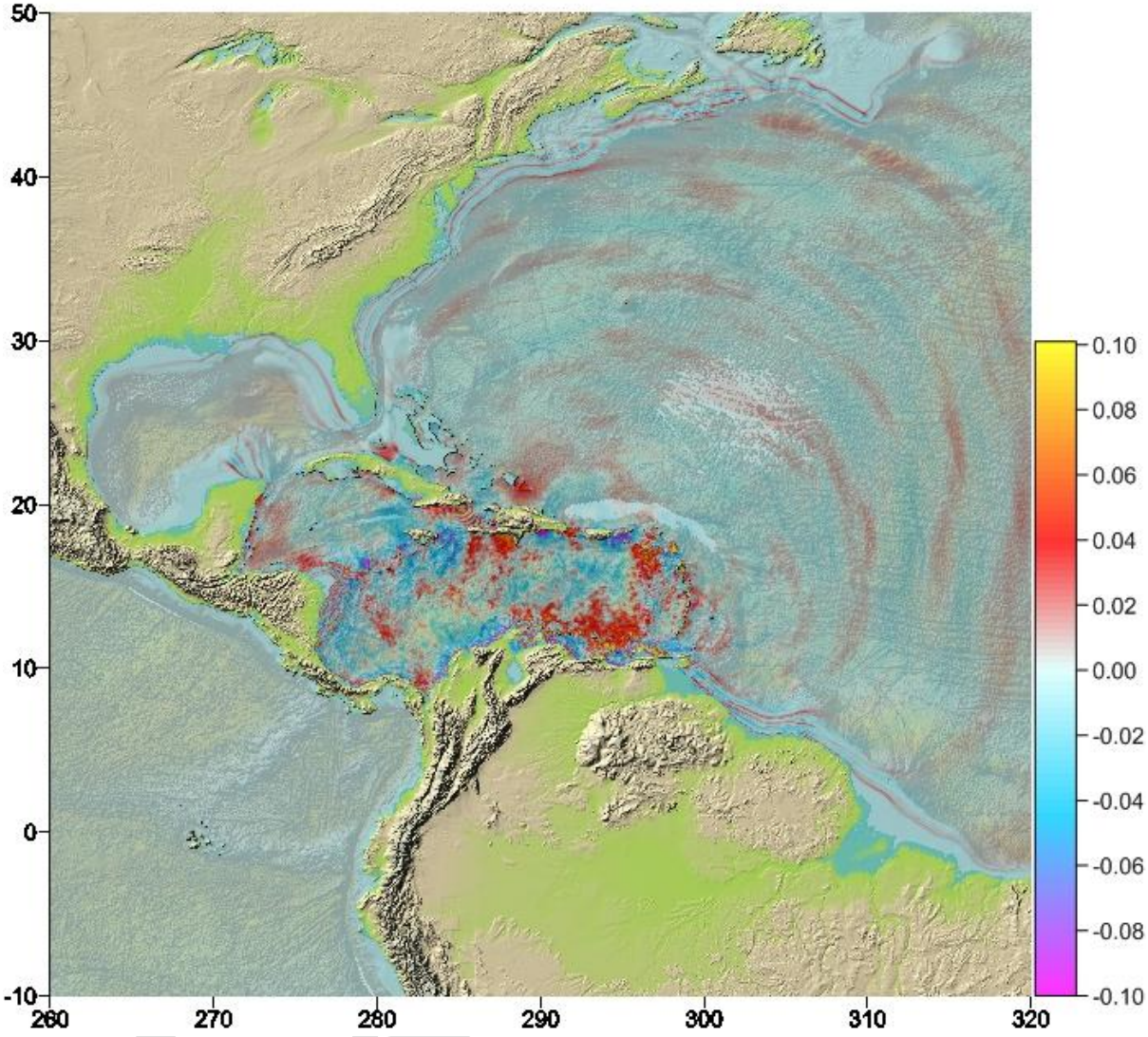

Figure B11. Tsunami at six hours according to ATFM Model (scale in meters).

Appendix C. Earthquake Impact Scenario

When planning for a tsunami it is important to also take into consideration the potential earthquake impact in areas close to the source, as these impacts can affect tsunami response and increase the tsunami impact, by hindering evacuation and contribute debris to be carried by the waves. For earthquake impact, the United States Geological Survey has developed ShakeMap and the Prompt Assessment of Global Earthquakes for Response (PAGER). The main purpose of ShakeMap is to display the levels of ground shaking produced by the earthquake. The ground shaking events levels in the region are studied depending on the magnitude of the earthquake, distance from the earthquake source, rock and soil behaviour in the region and propagation of the seismic waves through the Earth's crust. Based on the output of ShakeMap, PAGER estimates the population exposed to earthquake shaking, fatalities and economic losses.

Earthquake Event

The input information for ShakeMap and PAGER are the four corners of the fault plane and the depths at each of these four corners. For the case of CARIBE WAVE/LANTEX 2013, the fault plane is 200 km long and the depths vary from 10 km in the North and 39.2 km in the South (Figure C1).

According to ShakeMap (Figure C1), intensities of up to VIII on the Mercalli Modified Scale could be observed. The strongest ground shaking is predicted form Aruba and Curacao, while to the South in Colombia and Venezuela, the ground shaking is moderate.

According to PAGER, (Figure C2) an earthquake such as that used for CARIBE WAVE/LANTEX 2013, would produce an orange alert for Aruba and Curacao. This means that significant casualties and damage from the earthquake alone are likely. According to the PAGER results, the countries that are going to receive the greatest impact from the earthquake are Aruba, Curacao, and Venezuela. In terms of population exposed to earthquake shaking, it is estimated that almost 230,000 people will be exposed to Modified Mercalli intensities up to VII in Aruba, Curacao and VI – V in Venezuela and Colombia. Figures C1 and C2 shows ShakeMap and PAGER outputs for the CARIBE WAVE/LANTEX 13 earthquake scenario.

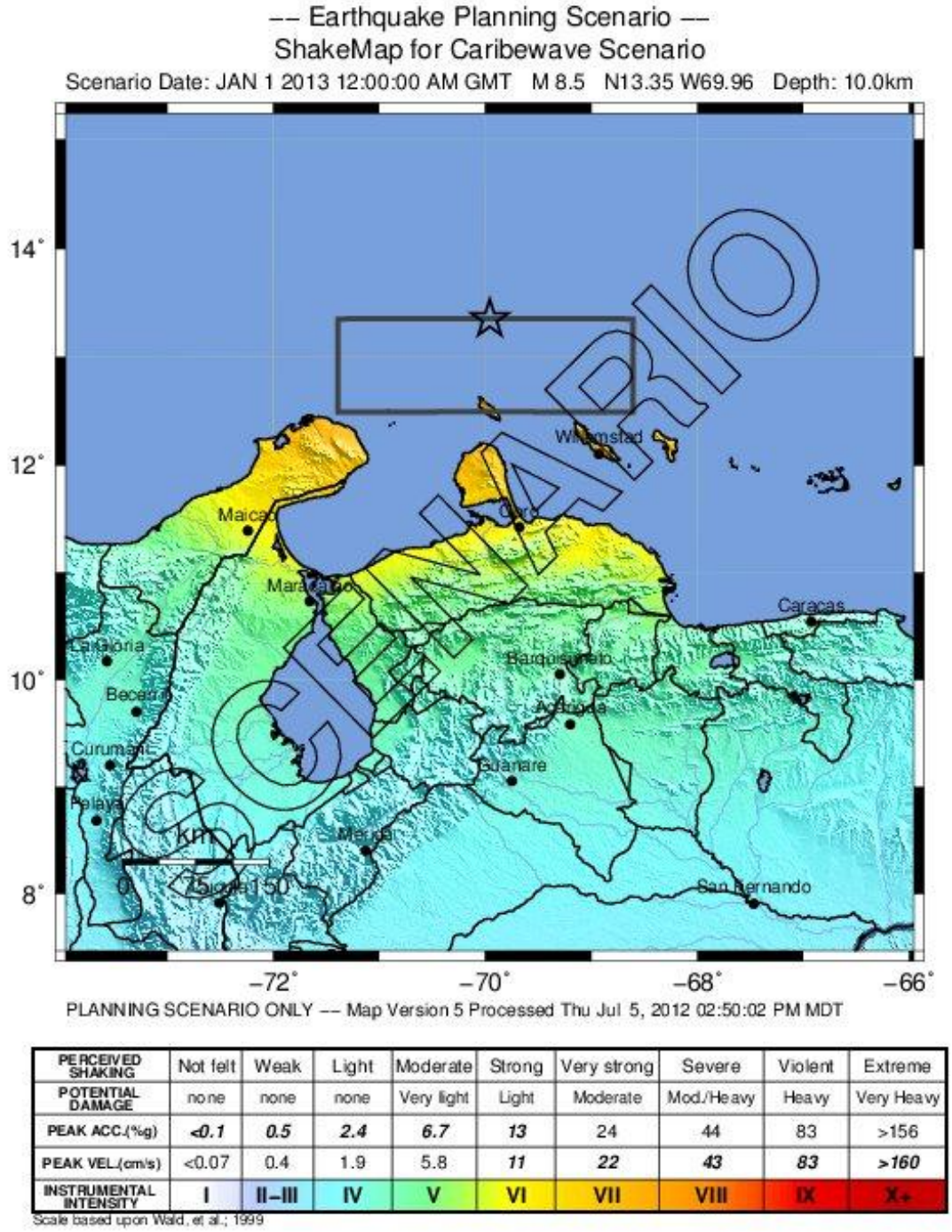

Figure C1. Shake Map output for CARIBE WAVE/LANTEX 13 earthquake scenario (USGS).

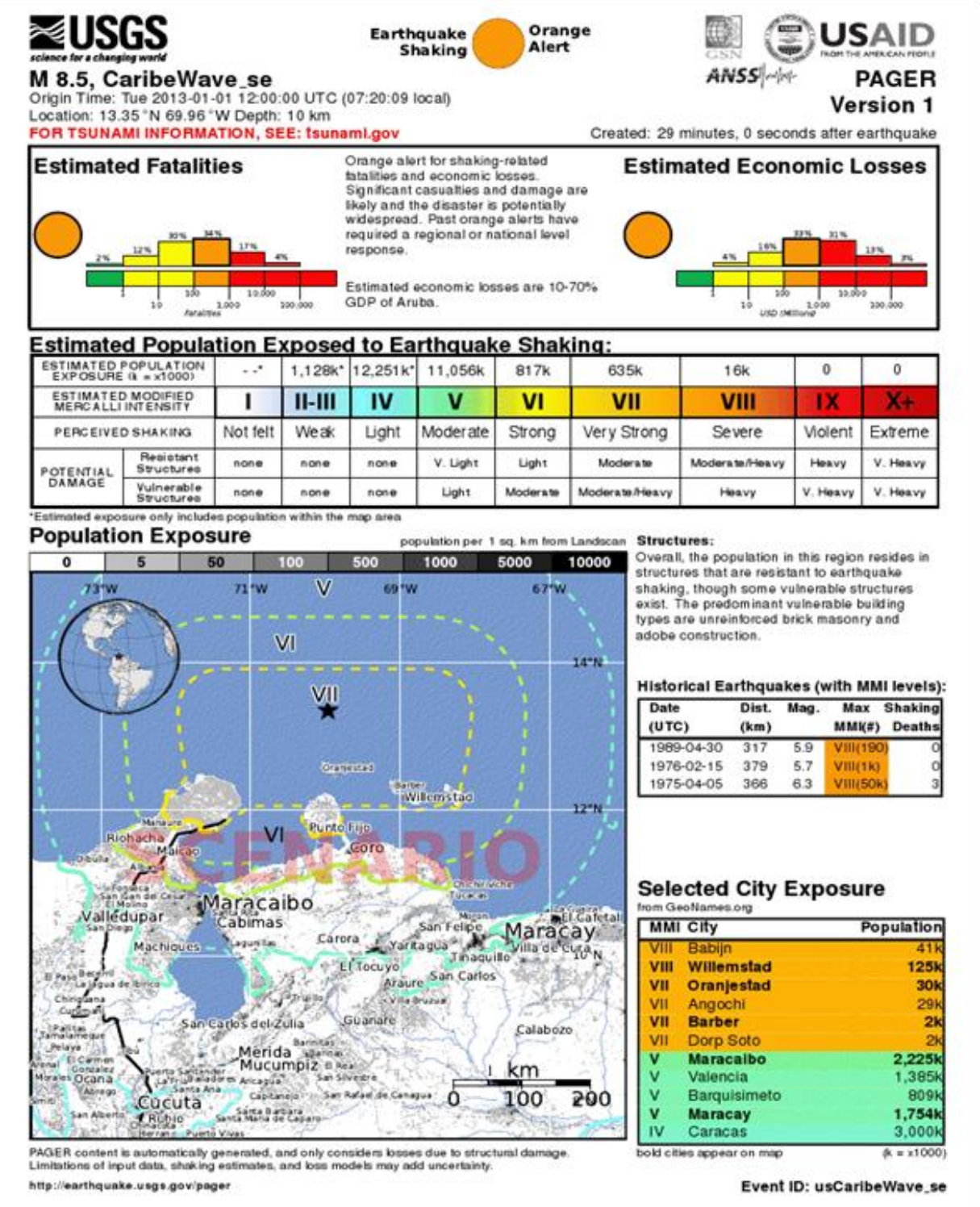

Figure C2. PAGER output for CARIBE WAVE/LANTEX 13 earthquake scenario (USGS).

Appendix D. TWC Dummy Messages

WCATWC

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WEXX30 PAAQ 201302
TSUATE

TEST...TSUNAMI EXERCISE MESSAGE NUMBER 1...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
902 AM AST WED MAR 20 2013

...CARIBE WAVE 13/LANTEX 13 TSUNAMI EXERCISE MESSAGE. REFER TO WCATWC MESSAGE 1
IN THE EXERCISE HANDBOOK. THIS IS AN EXERCISE ONLY...

THIS MESSAGE IS BEING USED TO START THE CARIBE WAVE 13/LANTEX 13 CARIBBEAN
TSUNAMI EXERCISE.  THIS WILL BE THE ONLY EXERCISE MESSAGE BROADCAST FROM THE
WEST COAST/ALASKA TSUNAMI WARNING CENTER EXCLUDING SPECIAL EMAIL MESSAGES
DISCUSSED IN THE HANDBOOK.  THE HANDBOOK IS AVAILABLE AT THE WEB SITE
WCATWC.ARH.NOAA.GOV. THE EXERCISE PURPOSE IS TO PROVIDE EMERGENCY MANAGEMENT A
REALISTIC SCENARIO TO TEST TSUNAMI RESPONSE PLANS.

THIS IS ONLY AN EXERCISE.

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PTWC

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WECA41 PHEB 201302
TSUCAX

TEST...TSUNAMI EXERCISE MESSAGE NUMBER 1...TEST
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1302Z 20 MAR 2013

...CARIBE WAVE 13/LANTEX 13 TSUNAMI EXERCISE MESSAGE. REFER TO PTWC MESSAGE 1 IN
THE EXERCISE HANDBOOK. THIS IS AN EXERCISE ONLY...

THIS MESSAGE IS BEING USED TO START THE CARIBE WAVE 13/LANTEX 13 CARIBBEAN
TSUNAMI EXERCISE.  THIS WILL BE THE ONLY EXERCISE MESSAGE BROADCAST FROM THE
PACIFIC TSUNAMI WARNING CENTER EXCLUDING SPECIAL EMAIL MESSAGES DISCUSSED IN THE
HANDBOOK.  THE HANDBOOK IS AVAILABLE AT THE WEB SITE WCATWC.ARH.NOAA.GOV. THE
EXERCISE PURPOSE IS TO PROVIDE EMERGENCY MANAGEMENT A REALISTIC SCENARIO TO TEST
TSUNAMI RESPONSE PLANS.

THIS IS ONLY AN EXERCISE.

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Appendix E. WCATWC Exercise Messages

The following messages, created for the CARIBE WAVE 13/LANTEX 13 tsunami exercise, are representative of the official standard products issued by the WCATWC during a large magnitude 8.5 earthquake and tsunami originating 57 miles north of Oranjestad, Aruba in the Caribbean Sea at 13.35°N, 69.95°W. During a real event, the TWCs would also issue graphical and html-based products to their web sites and via RSS. Forecasts are only provided for points where the WCATWC has high resolution digital elevation models. Observations are only provided for locations where there is a tide gauge to which the WCATWC has real time access.

WCATWC Message #1

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WEXX30 PAAQ 201302
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
902 AM AST WED MAR 20 2013

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


WARNINGS/ADVISORIES/WATCHES
---------------------------
TSUNAMI WARNING IN EFFECT FOR...

 * COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.


PRELIMINARY EARTHQUAKE PARAMETERS
---------------------------------
 * MAGNITUDE      8.5
 * ORIGIN TIME    0900  EDT MAR 20 2013
                  0900  AST MAR 20 2013
                  0800  CDT MAR 20 2013
                  1300  UTC MAR 20 2013
 * COORDINATES    13.4 NORTH 70.0 WEST
 * DEPTH          6 MILES / 10 KM
 * LOCATION       CARIBBEAN SEA


IMPACTS FOR TSUNAMI WARNING AREAS
---------------------------------
 * A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS
   EXPECTED.

 * WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL
   CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER
   TSUNAMI ARRIVAL.


RECOMMENDED ACTIONS
-------------------
 * 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
-------------------------------------------------
              FORECAST         FORECAST   FORECAST         OBSERVED
              START OF         TSUNAMI    MAX TSUNAMI      MAX TSUNAMI
```

```
SITE          OF TSUNAMI       DURATION   HEIGHT           HEIGHT
------        ----------       ---------  ----------       -----------
 * PUERTO RICO
 PENUELAS      0958 AST 03/20
 YABUCOA       1002 AST 03/20
 MAYAGUEZ      1011 AST 03/20
 SAN JUAN      1021 AST 03/20
 ESPERANZA     1029 AST 03/20

 * VIRGIN ISLANDS
 LAMESHUR BAY  1011 AST 03/20
 CHARLOTTE AM  1015 AST 03/20

FORECAST MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE PREDICTED
TIDE.

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

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


NEXT UPDATE AND ADDITIONAL INFORMATION
--------------------------------------
 * THIS MESSAGE WILL BE UPDATED IN 30 MINUTES.

 * REFER TO THE INTERNET SITE WCATWC.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.

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WCATWC Message #2

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WEXX30 PAAQ 201337
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 2
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
937 AM AST WED MAR 20 2013

NEW OBSERVATIONS AND FORECASTS ARE LISTED BELOW.

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


WARNINGS/ADVISORIES/WATCHES
---------------------------
TSUNAMI WARNING IN EFFECT FOR...

 * COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.


IMPACTS FOR TSUNAMI WARNING AREAS
---------------------------------
 * A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS
   EXPECTED.

 * WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL
   CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER
   TSUNAMI ARRIVAL.


RECOMMENDED ACTIONS
-------------------
 * 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.
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```
 * DO NOT RETURN TO THE COAST UNTIL LOCAL EMERGENCY OFFICIALS
   INDICATE IT IS SAFE TO DO SO.


FORECASTS AND/OR OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED
-----------------------------------------------------------
              FORECAST         FORECAST   FORECAST         OBSERVED
              START OF         TSUNAMI    MAX TSUNAMI      MAX TSUNAMI
SITE          OF TSUNAMI       DURATION   HEIGHT           HEIGHT
------        ----------       ---------  ----------       -----------
 * PUERTO RICO
 PENUELAS      0958 AST 03/20   18 HRS     03.6FT +/- 1.1
 YABUCOA       1002 AST 03/20   12 HRS     03.1FT +/- 0.9
 MAYAGUEZ      1011 AST 03/20   12 HRS     02.1FT +/- 0.6
 SAN JUAN      1021 AST 03/20   12 HRS     01.0FT +/- 0.3
 ESPERANZA     1029 AST 03/20   12 HRS     01.8FT +/- 0.5

 * VIRGIN ISLANDS
 LAMESHUR BAY  1011 AST 03/20   12 HRS     01.9FT +/- 0.6
 CHARLOTTE AM  1015 AST 03/20   12 HRS     03.0FT +/- 0.9

 DEEP OCEAN PRESSURE SENSOR DATA INDICATES A TSUNAMI WAS GENERATED.

FORECAST MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE PREDICTED
TIDE.

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

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

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED
-----------------------------------------------------
                              TIME                OBSERVED MAX
 SITE                      OF MEASUREMENT       TSUNAMI HEIGHT
 --------------------      --------------       ---------------
 WILLEMSTAD CURACAO         0929 AST  03/20      05.8FT


PRELIMINARY EARTHQUAKE PARAMETERS
---------------------------------
 * MAGNITUDE      8.5
 * ORIGIN TIME    0900  EDT MAR 20 2013
                  0900  AST MAR 20 2013
                  0800  CDT MAR 20 2013
                  1300  UTC MAR 20 2013
 * COORDINATES    13.4 NORTH 70.0 WEST
 * DEPTH          6 MILES / 10 KM
 * LOCATION       CARIBBEAN SEA


NEXT UPDATE AND ADDITIONAL INFORMATION
--------------------------------------
 * THIS MESSAGE WILL BE UPDATED IN 30 MINUTES.

 * REFER TO THE INTERNET SITE WCATWC.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.

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WCATWC Message #3

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WEXX30 PAAQ 201402
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 3
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1002 AM AST WED MAR 20 2013
```

NEW OBSERVATIONS ARE LISTED BELOW.

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

WARNINGS/ADVISORIES/WATCHES

TSUNAMI WARNING IN EFFECT FOR...

* COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.

IMPACTS FOR TSUNAMI WARNING AREAS
---
* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.

* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.

RECOMMENDED ACTIONS
---
* 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 - UPDATED

SITE	FORECAST START OF OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED MAX TSUNAMI HEIGHT
* PUERTO RICO				
PENUELAS	0958 AST 03/20	18 HRS	03.6FT +/- 1.1	02.3FT
YABUCOA	1002 AST 03/20	12 HRS	03.1FT +/- 0.9	
MAYAGUEZ	1011 AST 03/20	12 HRS	02.1FT +/- 0.6	
SAN JUAN	1021 AST 03/20	12 HRS	01.0FT +/- 0.3	
ESPERANZA	1029 AST 03/20	12 HRS	01.8FT +/- 0.5	
* VIRGIN ISLANDS				
LAMESHUR BAY	1011 AST 03/20	12 HRS	01.9FT +/- 0.6	
CHARLOTTE AM	1015 AST 03/20	12 HRS	03.0FT +/- 0.9	

DEEP OCEAN PRESSURE SENSOR DATA INDICATES A TSUNAMI WAS GENERATED.

FORECAST MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE PREDICTED TIDE.

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

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

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
WILLEMSTAD CURACAO	0929 AST 03/20	05.8FT
SANTO DOMINGO DR	0953 AST 03/20	11.2FT
BARAHONA DR	0955 AST 03/20	07.2FT

PRELIMINARY EARTHQUAKE PARAMETERS
---
* MAGNITUDE 8.5
* ORIGIN TIME 0900 EDT MAR 20 2013

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                  0900  AST MAR 20 2013
                  0800  CDT MAR 20 2013
                  1300  UTC MAR 20 2013
 * COORDINATES    13.4 NORTH 70.0 WEST
 * DEPTH          6 MILES / 10 KM
 * LOCATION       CARIBBEAN SEA


NEXT UPDATE AND ADDITIONAL INFORMATION
--------------------------------------
 * THIS MESSAGE WILL BE UPDATED IN 30 MINUTES.

 * REFER TO THE INTERNET SITE WCATWC.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.

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WCATWC Message #4

```
WEXX30 PAAQ 201432
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 4
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1032 AM AST WED MAR 20 2013

NEW OBSERVATIONS ARE LISTED BELOW.

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


WARNINGS/ADVISORIES/WATCHES
---------------------------
TSUNAMI WARNING IN EFFECT FOR...

 * COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.


IMPACTS FOR TSUNAMI WARNING AREAS
---------------------------------
 * A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS
   EXPECTED.

 * WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL
   CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER
   TSUNAMI ARRIVAL.


RECOMMENDED ACTIONS
-------------------
 * 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 - UPDATED
-----------------------------------------------------------
              FORECAST         FORECAST   FORECAST         OBSERVED
              START OF         TSUNAMI    MAX TSUNAMI      MAX TSUNAMI
SITE          OF TSUNAMI       DURATION   HEIGHT           HEIGHT
------        ----------       ---------  ----------       -----------
 * PUERTO RICO
 PENUELAS      0958 AST 03/20   18 HRS     03.6FT +/- 1.1   03.0FT
 YABUCOA       1002 AST 03/20   12 HRS     03.1FT +/- 0.9   02.2FT
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 MAYAGUEZ      1011 AST 03/20   12 HRS     02.1FT +/- 0.6   01.7FT
 SAN JUAN      1021 AST 03/20   12 HRS     01.0FT +/- 0.3   00.4FT
 ESPERANZA     1029 AST 03/20   12 HRS     01.8FT +/- 0.5   01.2FT

 * VIRGIN ISLANDS
 LAMESHUR BAY  1011 AST 03/20   12 HRS     01.9FT +/- 0.6   01.9FT
 CHARLOTTE AM  1015 AST 03/20   12 HRS     03.0FT +/- 0.9   02.1FT

SIGNIFICANT FLOODING HAS BEEN REPORTED PUERTO RICO AND IN CHARLOTTEL
AMALIE USVI.

FORECAST MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE PREDICTED
TIDE.

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

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

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED
-----------------------------------------------------
                              TIME              OBSERVED MAX
 SITE                      OF MEASUREMENT       TSUNAMI HEIGHT
 ---------------------     ---------------      ----------------
 WILLEMSTAD CURACAO         0929 AST  03/20      05.8FT
 SANTO DOMINGO DR           0953 AST  03/20      11.2FT
 PUNTA CANA DR              1003 AST  03/20      01.8FT
 ROSEAU DOMINICA            1018 AST  03/20      00.8FT
 BARAHONA DR                1027 AST  03/20      07.7FT


PRELIMINARY EARTHQUAKE PARAMETERS
---------------------------------
 * MAGNITUDE      8.5
 * ORIGIN TIME    0900  EDT MAR 20 2013
                  0900  AST MAR 20 2013
                  0800  CDT MAR 20 2013
                  1300  UTC MAR 20 2013
 * COORDINATES    13.4 NORTH 70.0 WEST
 * DEPTH          6 MILES / 10 KM
 * LOCATION       CARIBBEAN SEA


NEXT UPDATE AND ADDITIONAL INFORMATION
--------------------------------------
 * THIS MESSAGE WILL BE UPDATED IN 30 MINUTES.

 * REFER TO THE INTERNET SITE WCATWC.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.

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WCATWC Message #5

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WEXX30 PAAQ 201502
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 5
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1102 AM AST WED MAR 20 2013

NEW OBSERVATIONS ARE LISTED BELOW.

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


WARNINGS/ADVISORIES/WATCHES
---------------------------
TSUNAMI WARNING IN EFFECT FOR...
```

* COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.

IMPACTS FOR TSUNAMI WARNING AREAS
---

* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS EXPECTED.

* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER TSUNAMI ARRIVAL.

RECOMMENDED ACTIONS
---

* 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 - UPDATED

SITE	FORECAST START OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED MAX TSUNAMI HEIGHT
* PUERTO RICO				
PENUELAS	0958 AST 03/20	18 HRS	03.6FT +/- 1.1	03.0FT
YABUCOA	1002 AST 03/20	12 HRS	03.1FT +/- 0.9	02.8FT
MAYAGUEZ	1011 AST 03/20	12 HRS	02.1FT +/- 0.6	01.7FT
SAN JUAN	1021 AST 03/20	12 HRS	01.0FT +/- 0.3	00.6FT
ESPERANZA	1029 AST 03/20	12 HRS	01.8FT +/- 0.5	01.2FT
* VIRGIN ISLANDS				
LAMESHUR BAY	1011 AST 03/20	12 HRS	01.9FT +/- 0.6	01.9FT
CHARLOTTE AM	1015 AST 03/20	12 HRS	03.0FT +/- 0.9	02.8FT

FORECAST MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE PREDICTED TIDE.

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

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

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
WILLEMSTAD CURACAO	0929 AST 03/20	05.8FT
SANTO DOMINGO DR	0953 AST 03/20	11.2FT
PUNTA CANA DR	1003 AST 03/20	01.8FT
ROSEAU DOMINICA	1018 AST 03/20	00.8FT
BARAHONA DR	1027 AST 03/20	07.7FT
DESIRADE GUADELOUPE	1056 AST 03/20	00.3FT

PRELIMINARY EARTHQUAKE PARAMETERS
---

* MAGNITUDE 8.5
* ORIGIN TIME 0900 EDT MAR 20 2013
  0900 AST MAR 20 2013
  0800 CDT MAR 20 2013
  1300 UTC MAR 20 2013
* COORDINATES 13.4 NORTH 70.0 WEST
* DEPTH 6 MILES / 10 KM
* LOCATION CARIBBEAN SEA

NEXT UPDATE AND ADDITIONAL INFORMATION

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--------------------------------------
 * THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.

 * REFER TO THE INTERNET SITE WCATWC.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.

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WCATWC Message #6

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WEXX30 PAAQ 201604
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 6
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1204 PM AST WED MAR 20 2013

NEW OBSERVATIONS ARE LISTED BELOW.

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


WARNINGS/ADVISORIES/WATCHES
---------------------------
TSUNAMI WARNING IN EFFECT FOR...

 * COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.


IMPACTS FOR TSUNAMI WARNING AREAS
---------------------------------
 * A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS
   EXPECTED.

 * WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL
   CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER
   TSUNAMI ARRIVAL.


RECOMMENDED ACTIONS
-------------------
 * 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 - UPDATED
-----------------------------------------------------------
              FORECAST         FORECAST   FORECAST         OBSERVED
              START OF         TSUNAMI    MAX TSUNAMI      MAX TSUNAMI
SITE          OF TSUNAMI       DURATION   HEIGHT           HEIGHT
------        ----------       ---------  ----------       -----------
 * PUERTO RICO
 PENUELAS      0958 AST 03/20   18 HRS     03.6FT +/- 1.1   03.6FT
 YABUCOA       1002 AST 03/20   12 HRS     03.1FT +/- 0.9   03.0FT
 MAYAGUEZ      1011 AST 03/20   12 HRS     02.1FT +/- 0.6   01.7FT
 SAN JUAN      1021 AST 03/20   12 HRS     01.0FT +/- 0.3   00.8FT
 ESPERANZA     1029 AST 03/20   12 HRS     01.8FT +/- 0.5   01.9FT

 * VIRGIN ISLANDS
 LAMESHUR BAY  1011 AST 03/20   12 HRS     01.9FT +/- 0.6   01.9FT
 CHARLOTTE AM  1015 AST 03/20   12 HRS     03.0FT +/- 0.9   02.8FT

DAMAGE TO BOATS AND STRUCTURES IN PENUELAS AND YABUCOA PUERTO RICO
HAS BEEN REPORTED.
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FORECAST MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE PREDICTED
TIDE.

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

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

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
WILLEMSTAD CURACAO	0929 AST 03/20	05.8FT
SANTO DOMINGO DR	0953 AST 03/20	11.2FT
PUNTA CANA DR	1003 AST 03/20	01.8FT
ROSEAU DOMINICA	1018 AST 03/20	00.8FT
BARAHONA DR	1027 AST 03/20	07.7FT
DESIRADE GUADELOUPE	1056 AST 03/20	00.3FT
CAP HAITIEN HT	1146 AST 03/20	00.4FT

PRELIMINARY EARTHQUAKE PARAMETERS

* MAGNITUDE	8.5
* ORIGIN TIME	0900 EDT MAR 20 2013 0900 AST MAR 20 2013 0800 CDT MAR 20 2013 1300 UTC MAR 20 2013
* COORDINATES	13.4 NORTH 70.0 WEST
* DEPTH	6 MILES / 10 KM
* LOCATION	CARIBBEAN SEA

NEXT UPDATE AND ADDITIONAL INFORMATION

* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.

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

* 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.

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WCATWC Message #7

WEXX30 PAAQ 201704
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 7
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
104 PM AST WED MAR 20 2013

NEW OBSERVATIONS ARE LISTED BELOW.

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

WARNINGS/ADVISORIES/WATCHES
TSUNAMI WARNING IN EFFECT FOR...

* COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.

IMPACTS FOR TSUNAMI WARNING AREAS

* A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS
  EXPECTED.

* WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL
  CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER
  TSUNAMI ARRIVAL.

RECOMMENDED ACTIONS
---
* 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 - UPDATED

SITE	FORECAST START OF TSUNAMI	FORECAST TSUNAMI DURATION	FORECAST MAX TSUNAMI HEIGHT	OBSERVED MAX TSUNAMI HEIGHT
* PUERTO RICO				
PENUELAS	0958 AST 03/20	18 HRS	03.6FT +/- 1.1	03.6FT
YABUCOA	1002 AST 03/20	12 HRS	03.1FT +/- 0.9	02.8FT
MAYAGUEZ	1011 AST 03/20	12 HRS	02.1FT +/- 0.6	01.9FT
SAN JUAN	1021 AST 03/20	12 HRS	01.0FT +/- 0.3	01.1FT
ESPERANZA	1029 AST 03/20	12 HRS	01.8FT +/- 0.5	01.9FT
* VIRGIN ISLANDS				
LAMESHUR BAY	1011 AST 03/20	12 HRS	01.9FT +/- 0.6	01.9FT
CHARLOTTE AM	1015 AST 03/20	12 HRS	03.0FT +/- 0.9	03.1FT

THREE FATALIES HAVE BEEN REPORTED NEAR CHARLOTTE AMALIE USVI.

FORECAST MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE PREDICTED
TIDE.

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

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

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY - UPDATED

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
WILLEMSTAD CURACAO	0929 AST 03/20	05.8FT
SANTO DOMINGO DR	0953 AST 03/20	11.2FT
PUNTA CANA DR	1003 AST 03/20	01.8FT
ROSEAU DOMINICA	1018 AST 03/20	00.8FT
BARAHONA DR	1027 AST 03/20	07.7FT
CAP HAITIEN HT	1146 AST 03/20	00.4FT
DESIRADE GUADELOUPE	1208 AST 03/20	00.6FT

PRELIMINARY EARTHQUAKE PARAMETERS
---
* MAGNITUDE 8.5
* ORIGIN TIME 0900 EDT MAR 20 2013
  0900 AST MAR 20 2013
  0800 CDT MAR 20 2013
  1300 UTC MAR 20 2013
* COORDINATES 13.4 NORTH 70.0 WEST
* DEPTH 6 MILES / 10 KM
* LOCATION CARIBBEAN SEA

NEXT UPDATE AND ADDITIONAL INFORMATION
---
* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.

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

```
 * 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.

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WCATWC Message #8

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WEXX30 PAAQ 201803
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 8
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
203 PM AST WED MAR 20 2013

NO NEW UPDATES SINCE LAST MESSAGE.

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


WARNINGS/ADVISORIES/WATCHES
---------------------------
TSUNAMI WARNING IN EFFECT FOR...

 * COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.


IMPACTS FOR TSUNAMI WARNING AREAS
---------------------------------
 * A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION OF LAND IS
   EXPECTED.

 * WIDESPREAD DANGEROUS COASTAL FLOODING ACCOMPANIED BY POWERFUL
   CURRENTS IS POSSIBLE AND MAY CONTINUE FOR MANY HOURS AFTER
   TSUNAMI ARRIVAL.


RECOMMENDED ACTIONS
-------------------
 * 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
-------------------------------------------------
              FORECAST         FORECAST   FORECAST         OBSERVED
              START OF         TSUNAMI    MAX TSUNAMI      MAX TSUNAMI
SITE          OF TSUNAMI       DURATION   HEIGHT           HEIGHT
------        ----------       ---------  -----------      -----------
 * PUERTO RICO
 PENUELAS      0958 AST 03/20   18 HRS     03.6FT +/- 1.1   03.6FT
 YABUCOA       1002 AST 03/20   12 HRS     03.1FT +/- 0.9   02.8FT
 MAYAGUEZ      1011 AST 03/20   12 HRS     02.1FT +/- 0.6   01.9FT
 SAN JUAN      1021 AST 03/20   12 HRS     01.0FT +/- 0.3   01.1FT
 ESPERANZA     1029 AST 03/20   12 HRS     01.8FT +/- 0.5   01.9FT

 * VIRGIN ISLANDS
 LAMESHUR BAY  1011 AST 03/20   12 HRS     01.9FT +/- 0.6   01.9FT
 CHARLOTTE AM  1015 AST 03/20   12 HRS     03.0FT +/- 0.9   03.1FT

FORECAST MAX TSUNAMI HEIGHT IS THE WATER LEVEL ABOVE PREDICTED
TIDE.

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

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

ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY

SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
WILLEMSTAD CURACAO	0929 AST 03/20	05.8FT
SANTO DOMINGO DR	0953 AST 03/20	11.2FT
PUNTA CANA DR	1003 AST 03/20	01.8FT
ROSEAU DOMINICA	1018 AST 03/20	00.8FT
BARAHONA DR	1027 AST 03/20	07.7FT
CAP HAITIEN HT	1146 AST 03/20	00.4FT
DESIRADE GUADELOUPE	1208 AST 03/20	00.6FT

PRELIMINARY EARTHQUAKE PARAMETERS

* MAGNITUDE	8.5
* ORIGIN TIME	0900 EDT MAR 20 2013 0900 AST MAR 20 2013 0800 CDT MAR 20 2013 1300 UTC MAR 20 2013
* COORDINATES	13.4 NORTH 70.0 WEST
* DEPTH	6 MILES / 10 KM
* LOCATION	CARIBBEAN SEA

NEXT UPDATE AND ADDITIONAL INFORMATION

* THIS MESSAGE WILL BE UPDATED IN 60 MINUTES.

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

* 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.

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WCATWC Message #9

WEXX30 PAAQ 201902
TSUATE

BULLETIN
PUBLIC TSUNAMI MESSAGE NUMBER 9
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
302 PM AST WED MAR 20 2013

...THE TSUNAMI WARNING IS CANCELLED...

CANCELLATIONS

* COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.

IMPACTS - UPDATED

* TSUNAMI ACTIVITY HAS SUBSIDED ALONG THE COASTS OF PUERTO RICO... VIRGIN ISLANDS... AND U.S. AND CANADIAN COASTS IN THE ATLANTIC.

* ONGOING ACTIVITY MAY PERSIST IN SOME AREAS CAUSING STRONG CURRENTS DANGEROUS TO SWIMMERS AND BOATS.

* THE DETERMINATION TO RE-OCCUPY HAZARD ZONES MUST BE MADE BY LOCAL OFFICIALS.

RECOMMENDED ACTIONS - UPDATED

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


ADDITIONAL OBSERVATIONS OF TSUNAMI ACTIVITY
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SITE	TIME OF MEASUREMENT	OBSERVED MAX TSUNAMI HEIGHT
PENUELAS PUERTO RICO	1055 AST 03/20	03.6FT
YABUCOA PUERTO RICO	1045 AST 03/20	02.8FT
MAYAGUEZ PUERTO RICO	1115 AST 03/20	02.1FT
SAN JUAN PUERTO RICO	1105 AST 03/20	01.1FT
ESPERANZA VIEQUES IS. PR	1105 AST 03/20	01.9FT
LAMESHUR BAY USVI	1057 AST 03/20	01.9FT
CHARLOTTE AM USVI	1015 AST 03/20	03.1FT
WILLEMSTAD CURACAO	0929 AST 03/20	05.8FT
SANTO DOMINGO DR	0953 AST 03/20	11.2FT
PUNTA CANA DR	1003 AST 03/20	01.8FT
ROSEAU DOMINICA	1018 AST 03/20	00.8FT
BARAHONA DR	1027 AST 03/20	07.7FT
CAP HAITIEN HT	1146 AST 03/20	00.4FT
DESIRADE GUADELOUPE	1208 AST 03/20	00.6FT

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


NEXT UPDATE AND ADDITIONAL INFORMATION
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 * THIS WILL BE THE LAST WEST COAST/ALASKA TSUNAMI WARNING CENTER
   BULLETIN ISSUED FOR THIS EVENT.

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

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

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Appendix F. PTWC Exercise Messages

The following messages, created for the CARIBE WAVE 13/LANTEX 13 tsunami exercise, are representative of the official standard products issued by the PTWC during a large magnitude 8.5 earthquake and tsunami originating 57 miles north of Oranjestad, Aruba in the Caribbean Sea at 13.35°N, 69.95°W. During a real event, the TWCs would also issue graphical and html-based products. The computed travel times are based upon an estimate of the source size (in a real event the size or precise location of the source in real time would not be known), and also with the travel times computed on a 2-minute grid (during an event usually a 5-minute grid is used). The ETAs (Estimated Times of Arrival) do not refer to the size of the tsunami or if the threat level of the event, just the time that the first wave is expected to arrive, irrespective of height.

PTWC highlights that forecast ETAs in the near field (which is much of the Caribbean for events as large as used in this scenario) may not be very precise due to uncertainties in the way the fault ruptured and what parts generated the largest tsunami waves. Emergency Managers may feel the pressure to cancel the warning (watch) only 5 or 10 minutes after the ETA comes and goes, if there is no tsunami or only a small tsunami. The Tsunami Warning Focal Points and Emergency Managers may need to insist on waiting a good long time after the ETA or have other strong confirming evidence that there is no tsunami threat before cancelling.

Note that the new PTWC products for the CARIBE-EWS will be made available at least a month before the exercise on the following website:

http://www.caribewave.info

PTWC Message #1

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WECA41 PHEB 201302
TSUCAX

TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1302 UTC WED MAR 20 2013

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

... A CARIBBEAN-WIDE TSUNAMI WATCH IS IN EFFECT ...

A TSUNAMI WATCH IS IN EFFECT FOR

 ARUBA / BONAIRE / CURACAO / DOMINICAN REP / VENEZUELA /
 COLOMBIA / SAINT KITTS / MONTSERRAT / HAITI / GUADELOUPE /
 DOMINICA / SAINT LUCIA / ST VINCENT / SAINT MAARTEN / CUBA /
 MARTINIQUE / ANGUILLA / GRENADA / PANAMA / TURKS N CAICOS /
 BAHAMAS / BARBADOS / JAMAICA / CAYMAN BRAC / ANTIGUA / BARBUDA /
 SAINT MARTIN / GRAND CAYMAN / TRINIDAD TOBAGO / COSTA RICA /
 BERMUDA / MEXICO / NICARAGUA / HONDURAS / BELIZE / GUATEMALA /
 FRENCH GUIANA / GUYANA / SURINAME / BRAZIL

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1300Z 20 MAR 2013
COORDINATES - 13.4 NORTH 69.9 WEST
LOCATION - CARIBBEAN SEA
MAGNITUDE - 8.5

EVALUATION

EARTHQUAKES OF THIS SIZE HAVE THE POTENTIAL TO GENERATE A
WIDESPREAD DESTRUCTIVE TSUNAMI THAT CAN AFFECT COASTLINES ACROSS
THE ENTIRE CARIBBEAN REGION.

HOWEVER - IT IS NOT KNOWN THAT A TSUNAMI WAS GENERATED. THIS
WATCH IS BASED ONLY ON THE EARTHQUAKE EVALUATION. AUTHORITIES IN
THE REGION SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THE
POSSIBILITY OF A WIDESPREAD DESTRUCTIVE TSUNAMI.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS
WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL
ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE
LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN
SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
BONAIRE	ONIMA	12.3N 68.3W	1310Z 20 MAR
ARUBA	ORANJESTAD	12.5N 70.0W	1314Z 20 MAR
CURACAO	WILLEMSTAD	12.1N 68.9W	1326Z 20 MAR
COLOMBIA	SANTA_MARTA	11.2N 74.2W	1337Z 20 MAR
	RIOHACHA	11.6N 72.9W	1348Z 20 MAR
	BARRANQUILLA	11.1N 74.9W	1350Z 20 MAR
	CARTAGENA	10.4N 75.6W	1352Z 20 MAR
	PUNTA_CARIBANA	8.6N 76.9W	1426Z 20 MAR
VENEZUELA	MAIQUETIA	10.6N 67.0W	1339Z 20 MAR
	CUMANA	10.5N 64.2W	1423Z 20 MAR
	PUNTO_FIJO	11.7N 70.2W	1522Z 20 MAR
	GOLFO_VENEZUELA	11.4N 71.2W	1635Z 20 MAR
	PORLAMAR	10.9N 63.8W	1736Z 20 MAR
DOMINICAN REP	SANTO_DOMINGO	18.5N 69.9W	1350Z 20 MAR
	CABO_ENGANO	18.6N 68.3W	1356Z 20 MAR
	PUERTO_PLATA	19.8N 70.7W	1433Z 20 MAR
MONTSERRAT	PLYMOUTH	16.7N 62.2W	1404Z 20 MAR
SAINT LUCIA	CASTRIES	14.0N 61.0W	1404Z 20 MAR
GUADELOUPE	BASSE-TERRE	16.0N 61.7W	1405Z 20 MAR
HAITI	JEREMIE	18.6N 74.1W	1409Z 20 MAR
	CAP-HAITEN	19.8N 72.2W	1441Z 20 MAR
	PORT-AU-PRINCE	18.5N 72.4W	1507Z 20 MAR
GRENADA	SAINT_GEORGES	12.0N 61.8W	1410Z 20 MAR
DOMINICA	ROSEAU	15.3N 61.4W	1410Z 20 MAR
SAINT KITTS	BASSETERRE	17.3N 62.7W	1413Z 20 MAR
CUBA	SANTIAGO_D_CUBA	19.9N 75.8W	1413Z 20 MAR
	BARACOA	20.4N 74.5W	1429Z 20 MAR
	GIBARA	21.1N 76.1W	1457Z 20 MAR
	CIENFUEGOS	22.0N 80.5W	1504Z 20 MAR
	LA_HABANA	23.2N 82.4W	1614Z 20 MAR
	SANTA_CRZ_D_SUR	20.7N 78.0W	1731Z 20 MAR
	NUEVA_GERONA	21.9N 82.8W	1834Z 20 MAR
SAINT MAARTEN	SIMPSON_BAAI	18.0N 63.1W	1413Z 20 MAR
MARTINIQUE	FORT-DE-FRANCE	14.6N 61.1W	1414Z 20 MAR

ST VINCENT	KINGSTOWN	13.1N	61.2W	1416Z 20 MAR
JAMAICA	KINGSTON	17.9N	76.9W	1419Z 20 MAR
	MONTEGO_BAY	18.5N	77.9W	1428Z 20 MAR
ANGUILLA	THE_VALLEY	18.3N	63.1W	1419Z 20 MAR
PANAMA	PUERTO_CARRETO	8.8N	77.6W	1424Z 20 MAR
	ALIGANDI	9.2N	78.0W	1426Z 20 MAR
	PUERTO_OBALDIA	8.7N	77.4W	1427Z 20 MAR
	COLON	9.4N	79.9W	1435Z 20 MAR
	BOCAS_DEL_TORO	9.4N	82.2W	1501Z 20 MAR
ANTIGUA	SAINT_JOHNS	17.1N	61.9W	1431Z 20 MAR
BARBADOS	BRIDGETOWN	13.1N	59.6W	1431Z 20 MAR
BARBUDA	PALMETTO_POINT	17.6N	61.9W	1432Z 20 MAR
BAHAMAS	GREAT_INAGUA	20.9N	73.7W	1434Z 20 MAR
	MAYAGUANA	22.3N	73.0W	1447Z 20 MAR
	LONG_IS	23.3N	75.1W	1505Z 20 MAR
	CROOKED_IS	22.7N	74.1W	1509Z 20 MAR
	SAN_SALVADOR	24.1N	74.5W	1513Z 20 MAR
	ELEUTHERA_IS	25.2N	76.1W	1524Z 20 MAR
	EXUMA	23.6N	75.9W	1525Z 20 MAR
	CAT_IS	24.4N	75.5W	1525Z 20 MAR
	NASSAU	25.1N	77.4W	1537Z 20 MAR
	ANDROS_IS	25.0N	77.9W	1540Z 20 MAR
	FREEPORT	26.5N	78.8W	1558Z 20 MAR
	ABACO_IS	26.6N	77.1W	1612Z 20 MAR
	BIMINI	25.8N	79.3W	1618Z 20 MAR
TURKS N CAICOS	GRAND_TURK	21.5N	71.1W	1439Z 20 MAR
	WEST_CAICOS	21.7N	72.5W	1443Z 20 MAR
CAYMAN BRAC	CAYMAN_ISLANDS	19.7N	79.9W	1440Z 20 MAR
TRINIDAD TOBAGO	PIRATES_BAY	11.3N	60.6W	1445Z 20 MAR
	PORT-OF-SPAIN	10.6N	61.5W	1620Z 20 MAR
COSTA RICA	PUERTO_LIMON	10.0N	83.0W	1453Z 20 MAR
GRAND CAYMAN	CAYMAN_ISLANDS	19.3N	81.3W	1457Z 20 MAR
SAINT MARTIN	BAIE_BLANCHE	18.1N	63.0W	1459Z 20 MAR
NICARAGUA	PUNTA_GORDA	11.4N	83.8W	1541Z 20 MAR
	PUERTO_CABEZAS	14.0N	83.4W	1937Z 20 MAR
BERMUDA	RUTHS_BAY	32.4N	64.6W	1551Z 20 MAR
MEXICO	COZUMEL	20.5N	87.0W	1555Z 20 MAR
	VERACRUZ	19.2N	96.1W	1839Z 20 MAR
	MADERO	22.3N	97.8W	1845Z 20 MAR
	TEXAS_BORDER	26.0N	97.1W	1856Z 20 MAR
	CAMPECHE	19.9N	90.5W	2221Z 20 MAR
HONDURAS	PUERTO_CORTES	15.9N	88.0W	1555Z 20 MAR
	TRUJILLO	15.9N	86.0W	1626Z 20 MAR
BELIZE	BELIZE_CITY	17.5N	88.2W	1635Z 20 MAR
GUATEMALA	PUERTO_BARRIOS	15.7N	88.6W	1819Z 20 MAR
FRENCH GUIANA	CAYENNE	4.9N	52.3W	1843Z 20 MAR
SURINAME	PARAMARIBO	5.9N	55.2W	1850Z 20 MAR
GUYANA	GEORGETOWN	6.8N	58.2W	1851Z 20 MAR
BRAZIL	FORTALEZA	3.7S	38.5W	1934Z 20 MAR
	SAO_LUIS	2.5S	44.3W	2121Z 20 MAR
	ILHA_DE_MARACA	2.2N	50.5W	2200Z 20 MAR

ADDITIONAL BULLETINS WILL BE ISSUED BY THE PACIFIC TSUNAMI
WARNING CENTER FOR THIS EVENT AS MORE INFORMATION
BECOMES AVAILABLE.

PTWC Message #2

WECA41 PHEB 201330

TSUCAX

TSUNAMI MESSAGE NUMBER 2
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1330 UTC WED MAR 20 2013

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

... A CARIBBEAN-WIDE TSUNAMI WATCH IS IN EFFECT ...
... LARGE TSUNAMI WAVES HAVE BEEN OBSERVED ...

A TSUNAMI WATCH IS IN EFFECT FOR

ARUBA / BONAIRE / CURACAO / DOMINICAN REP / VENEZUELA /
COLOMBIA / SAINT KITTS / MONTSERRAT / HAITI / GUADELOUPE /
DOMINICA / SAINT LUCIA / ST VINCENT / SAINT MAARTEN / CUBA /
MARTINIQUE / ANGUILLA / GRENADA / PANAMA / TURKS N CAICOS /
BAHAMAS / BARBADOS / JAMAICA / CAYMAN BRAC / ANTIGUA / BARBUDA /
SAINT MARTIN / GRAND CAYMAN / TRINIDAD TOBAGO / COSTA RICA /
BERMUDA / MEXICO / NICARAGUA / HONDURAS / BELIZE / GUATEMALA /
FRENCH GUIANA / GUYANA / SURINAME / BRAZIL

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1300Z 20 MAR 2013
COORDINATES - 13.4 NORTH 69.9 WEST
LOCATION - CARIBBEAN SEA
MAGNITUDE - 8.5

MEASUREMENTS OR REPORTS OF TSUNAMI WAVE ACTIVITY

GAUGE LOCATION	LAT	LON	TIME	AMPL	PER
DART 42407	15.3N	68.2W	1324Z	0.42M / 1.4FT	20MIN

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).
PER - PERIOD OF TIME IN MINUTES(MIN) FROM ONE WAVE TO THE NEXT.

NOTE - DART MEASUREMENTS ARE FROM THE DEEP OCEAN AND THEY
ARE GENERALLY MUCH SMALLER THAN WOULD BE COASTAL
MEASUREMENTS AT SIMILAR LOCATIONS.

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE
ALREADY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE
EPICENTER.

BASED ON THESE DATA THE THREAT CONTINUES FOR ALL COASTAL AREAS OF
THE CARIBBEAN. FOR THOSE AREAS - WHEN NO MAJOR WAVES HAVE
OCCURRED FOR AT LEAST TWO HOURS AFTER THE ESTIMATED ARRIVAL TIME
OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN
LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO
BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE
TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE
VARIATION IN TSUNAMI WAVE ACTION THE ALL CLEAR DETERMINATION MUST

BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS
WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL
ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE
LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN
SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
BONAIRE	ONIMA	12.3N 68.3W	1310Z 20 MAR
ARUBA	ORANJESTAD	12.5N 70.0W	1314Z 20 MAR
CURACAO	WILLEMSTAD	12.1N 68.9W	1326Z 20 MAR
COLOMBIA	SANTA_MARTA	11.2N 74.2W	1337Z 20 MAR
	RIOHACHA	11.6N 72.9W	1348Z 20 MAR
	BARRANQUILLA	11.1N 74.9W	1350Z 20 MAR
	CARTAGENA	10.4N 75.6W	1352Z 20 MAR
	PUNTA_CARIBANA	8.6N 76.9W	1426Z 20 MAR
VENEZUELA	MAIQUETIA	10.6N 67.0W	1339Z 20 MAR
	CUMANA	10.5N 64.2W	1423Z 20 MAR
	PUNTO_FIJO	11.7N 70.2W	1522Z 20 MAR
	GOLFO_VENEZUELA	11.4N 71.2W	1635Z 20 MAR
	PORLAMAR	10.9N 63.8W	1736Z 20 MAR
DOMINICAN REP	SANTO_DOMINGO	18.5N 69.9W	1350Z 20 MAR
	CABO_ENGANO	18.6N 68.3W	1356Z 20 MAR
	PUERTO_PLATA	19.8N 70.7W	1433Z 20 MAR
MONTSERRAT	PLYMOUTH	16.7N 62.2W	1404Z 20 MAR
SAINT LUCIA	CASTRIES	14.0N 61.0W	1404Z 20 MAR
GUADELOUPE	BASSE-TERRE	16.0N 61.7W	1405Z 20 MAR
HAITI	JEREMIE	18.6N 74.1W	1409Z 20 MAR
	CAP-HAITEN	19.8N 72.2W	1441Z 20 MAR
	PORT-AU-PRINCE	18.5N 72.4W	1507Z 20 MAR
GRENADA	SAINT_GEORGES	12.0N 61.8W	1410Z 20 MAR
DOMINICA	ROSEAU	15.3N 61.4W	1410Z 20 MAR
SAINT KITTS	BASSETERRE	17.3N 62.7W	1413Z 20 MAR
CUBA	SANTIAGO_D_CUBA	19.9N 75.8W	1413Z 20 MAR
	BARACOA	20.4N 74.5W	1429Z 20 MAR
	GIBARA	21.1N 76.1W	1457Z 20 MAR
	CIENFUEGOS	22.0N 80.5W	1504Z 20 MAR
	LA_HABANA	23.2N 82.4W	1614Z 20 MAR
	SANTA_CRZ_D_SUR	20.7N 78.0W	1731Z 20 MAR
	NUEVA_GERONA	21.9N 82.8W	1834Z 20 MAR
SAINT MAARTEN	SIMPSON_BAAI	18.0N 63.1W	1413Z 20 MAR
MARTINIQUE	FORT-DE-FRANCE	14.6N 61.1W	1414Z 20 MAR
ST VINCENT	KINGSTOWN	13.1N 61.2W	1416Z 20 MAR
JAMAICA	KINGSTON	17.9N 76.9W	1419Z 20 MAR
	MONTEGO_BAY	18.5N 77.9W	1428Z 20 MAR
ANGUILLA	THE_VALLEY	18.3N 63.1W	1419Z 20 MAR
PANAMA	PUERTO_CARRETO	8.8N 77.6W	1424Z 20 MAR
	ALIGANDI	9.2N 78.0W	1426Z 20 MAR
	PUERTO_OBALDIA	8.7N 77.4W	1427Z 20 MAR
	COLON	9.4N 79.9W	1435Z 20 MAR
	BOCAS_DEL_TORO	9.4N 82.2W	1501Z 20 MAR
ANTIGUA	SAINT_JOHNS	17.1N 61.9W	1431Z 20 MAR
BARBADOS	BRIDGETOWN	13.1N 59.6W	1431Z 20 MAR
BARBUDA	PALMETTO_POINT	17.6N 61.9W	1432Z 20 MAR
BAHAMAS	GREAT_INAGUA	20.9N 73.7W	1434Z 20 MAR
	MAYAGUANA	22.3N 73.0W	1447Z 20 MAR
	LONG_IS	23.3N 75.1W	1505Z 20 MAR
	CROOKED_IS	22.7N 74.1W	1509Z 20 MAR
	SAN_SALVADOR	24.1N 74.5W	1513Z 20 MAR

	ELEUTHERA_IS	25.2N	76.1W	1524Z 20 MAR
	EXUMA	23.6N	75.9W	1525Z 20 MAR
	CAT_IS	24.4N	75.5W	1525Z 20 MAR
	NASSAU	25.1N	77.4W	1537Z 20 MAR
	ANDROS_IS	25.0N	77.9W	1540Z 20 MAR
	FREEPORT	26.5N	78.8W	1558Z 20 MAR
	ABACO_IS	26.6N	77.1W	1612Z 20 MAR
	BIMINI	25.8N	79.3W	1618Z 20 MAR
TURKS N CAICOS	GRAND_TURK	21.5N	71.1W	1439Z 20 MAR
	WEST_CAICOS	21.7N	72.5W	1443Z 20 MAR
CAYMAN BRAC	CAYMAN_ISLANDS	19.7N	79.9W	1440Z 20 MAR
TRINIDAD TOBAGO	PIRATES_BAY	11.3N	60.6W	1445Z 20 MAR
	PORT-OF-SPAIN	10.6N	61.5W	1620Z 20 MAR
COSTA RICA	PUERTO_LIMON	10.0N	83.0W	1453Z 20 MAR
GRAND CAYMAN	CAYMAN_ISLANDS	19.3N	81.3W	1457Z 20 MAR
SAINT MARTIN	BAIE_BLANCHE	18.1N	63.0W	1459Z 20 MAR
NICARAGUA	PUNTA_GORDA	11.4N	83.8W	1541Z 20 MAR
	PUERTO_CABEZAS	14.0N	83.4W	1937Z 20 MAR
BERMUDA	RUTHS_BAY	32.4N	64.6W	1551Z 20 MAR
MEXICO	COZUMEL	20.5N	87.0W	1555Z 20 MAR
	VERACRUZ	19.2N	96.1W	1839Z 20 MAR
	MADERO	22.3N	97.8W	1845Z 20 MAR
	TEXAS_BORDER	26.0N	97.1W	1856Z 20 MAR
	CAMPECHE	19.9N	90.5W	2221Z 20 MAR
HONDURAS	PUERTO_CORTES	15.9N	88.0W	1555Z 20 MAR
	TRUJILLO	15.9N	86.0W	1626Z 20 MAR
BELIZE	BELIZE_CITY	17.5N	88.2W	1635Z 20 MAR
GUATEMALA	PUERTO_BARRIOS	15.7N	88.6W	1819Z 20 MAR
FRENCH GUIANA	CAYENNE	4.9N	52.3W	1843Z 20 MAR
SURINAME	PARAMARIBO	5.9N	55.2W	1850Z 20 MAR
GUYANA	GEORGETOWN	6.8N	58.2W	1851Z 20 MAR
BRAZIL	FORTALEZA	3.7S	38.5W	1934Z 20 MAR
	SAO_LUIS	2.5S	44.3W	2121Z 20 MAR
	ILHA_DE_MARACA	2.2N	50.5W	2200Z 20 MAR

ADDITIONAL BULLETINS WILL BE ISSUED BY THE PACIFIC TSUNAMI
WARNING CENTER FOR THIS EVENT AS MORE INFORMATION
BECOMES AVAILABLE.

PTWC Message #3

WECA41 PHEB 201420
TSUCAX

TSUNAMI MESSAGE NUMBER 3
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1420 UTC WED MAR 20 2013

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

... A CARIBBEAN-WIDE TSUNAMI WATCH IS IN EFFECT ...
... THE TSUNAMI IS NOW IMPACTING COASTS ...

A TSUNAMI WATCH IS IN EFFECT FOR

ARUBA / BONAIRE / CURACAO / DOMINICAN REP / VENEZUELA /
COLOMBIA / SAINT KITTS / MONTSERRAT / HAITI / GUADELOUPE /
DOMINICA / SAINT LUCIA / ST VINCENT / SAINT MAARTEN / CUBA /
MARTINIQUE / ANGUILLA / GRENADA / PANAMA / TURKS N CAICOS /
BAHAMAS / BARBADOS / JAMAICA / CAYMAN BRAC / ANTIGUA / BARBUDA /
SAINT MARTIN / GRAND CAYMAN / TRINIDAD TOBAGO / COSTA RICA /

BERMUDA / MEXICO / NICARAGUA / HONDURAS / BELIZE / GUATEMALA /
FRENCH GUIANA / GUYANA / SURINAME / BRAZIL

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1300Z 20 MAR 2013
COORDINATES - 13.4 NORTH 69.9 WEST
LOCATION - CARIBBEAN SEA
MAGNITUDE - 8.5

MEASUREMENTS OR REPORTS OF TSUNAMI WAVE ACTIVITY

GAUGE LOCATION	LAT	LON	TIME	AMPL	PER
DART 42407	15.3N	68.2W	1324Z	0.42M / 1.4FT	20MIN
MONA ISLAND PR	18.1N	67.9W	1355Z	3.77M / 12.2FT	18MIN
PENUELAS PR	18.0N	66.8W	1359Z	1.11M / 3.6FT	16MIN
WILLEMSTAD CURACAO	12.1N	68.9W	1359Z	3.44M / 11.2FT	20MIN
PUNTA CANA DO	18.5N	68.4W	1405Z	4.50M / 14.6FT	20MIN
BARAHONA DO	18.2N	71.1W	1407Z	6.15M / 20.0FT	18MIN
LIMETREE VI	17.7N	64.8W	1411Z	1.41M / 4.6FT	16MIN
YABUCOA PR	18.1N	65.8W	1411Z	0.86M / 2.8FT	22MIN
MAYAGUEZ PR	18.2N	67.2W	1412Z	0.65M / 2.1FT	12MIN

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).
PER - PERIOD OF TIME IN MINUTES(MIN) FROM ONE WAVE TO THE NEXT.

NOTE - DART MEASUREMENTS ARE FROM THE DEEP OCEAN AND THEY
ARE GENERALLY MUCH SMALLER THAN WOULD BE COASTAL
MEASUREMENTS AT SIMILAR LOCATIONS.

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE
ALREADY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE
EPICENTER.

BASED ON THESE DATA THE THREAT CONTINUES FOR ALL COASTAL AREAS OF
THE CARIBBEAN. FOR THOSE AREAS - WHEN NO MAJOR WAVES HAVE
OCCURRED FOR AT LEAST TWO HOURS AFTER THE ESTIMATED ARRIVAL TIME
OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN
LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO
BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE
TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE
VARIATION IN TSUNAMI WAVE ACTION THE ALL CLEAR DETERMINATION MUST
BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS
WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL
ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE
LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN
SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
BONAIRE	ONIMA	12.3N 68.3W	1310Z 20 MAR
ARUBA	ORANJESTAD	12.5N 70.0W	1314Z 20 MAR

CURACAO	WILLEMSTAD	12.1N	68.9W	1326Z 20 MAR
COLOMBIA	SANTA_MARTA	11.2N	74.2W	1337Z 20 MAR
	RIOHACHA	11.6N	72.9W	1348Z 20 MAR
	BARRANQUILLA	11.1N	74.9W	1350Z 20 MAR
	CARTAGENA	10.4N	75.6W	1352Z 20 MAR
	PUNTA_CARIBANA	8.6N	76.9W	1426Z 20 MAR
VENEZUELA	MAIQUETIA	10.6N	67.0W	1339Z 20 MAR
	CUMANA	10.5N	64.2W	1423Z 20 MAR
	PUNTO_FIJO	11.7N	70.2W	1522Z 20 MAR
	GOLFO_VENEZUELA	11.4N	71.2W	1635Z 20 MAR
	PORLAMAR	10.9N	63.8W	1736Z 20 MAR
DOMINICAN REP	SANTO_DOMINGO	18.5N	69.9W	1350Z 20 MAR
	CABO_ENGANO	18.6N	68.3W	1356Z 20 MAR
	PUERTO_PLATA	19.8N	70.7W	1433Z 20 MAR
MONTSERRAT	PLYMOUTH	16.7N	62.2W	1404Z 20 MAR
SAINT LUCIA	CASTRIES	14.0N	61.0W	1404Z 20 MAR
GUADELOUPE	BASSE-TERRE	16.0N	61.7W	1405Z 20 MAR
HAITI	JEREMIE	18.6N	74.1W	1409Z 20 MAR
	CAP-HAITEN	19.8N	72.2W	1441Z 20 MAR
	PORT-AU-PRINCE	18.5N	72.4W	1507Z 20 MAR
GRENADA	SAINT_GEORGES	12.0N	61.8W	1410Z 20 MAR
DOMINICA	ROSEAU	15.3N	61.4W	1410Z 20 MAR
SAINT KITTS	BASSETERRE	17.3N	62.7W	1413Z 20 MAR
CUBA	SANTIAGO_D_CUBA	19.9N	75.8W	1413Z 20 MAR
	BARACOA	20.4N	74.5W	1429Z 20 MAR
	GIBARA	21.1N	76.1W	1457Z 20 MAR
	CIENFUEGOS	22.0N	80.5W	1504Z 20 MAR
	LA_HABANA	23.2N	82.4W	1614Z 20 MAR
	SANTA_CRZ_D_SUR	20.7N	78.0W	1731Z 20 MAR
	NUEVA_GERONA	21.9N	82.8W	1834Z 20 MAR
SAINT MAARTEN	SIMPSON_BAAI	18.0N	63.1W	1413Z 20 MAR
MARTINIQUE	FORT-DE-FRANCE	14.6N	61.1W	1414Z 20 MAR
ST VINCENT	KINGSTOWN	13.1N	61.2W	1416Z 20 MAR
JAMAICA	KINGSTON	17.9N	76.9W	1419Z 20 MAR
	MONTEGO_BAY	18.5N	77.9W	1428Z 20 MAR
ANGUILLA	THE_VALLEY	18.3N	63.1W	1419Z 20 MAR
PANAMA	PUERTO_CARRETO	8.8N	77.6W	1424Z 20 MAR
	ALIGANDI	9.2N	78.0W	1426Z 20 MAR
	PUERTO_OBALDIA	8.7N	77.4W	1427Z 20 MAR
	COLON	9.4N	79.9W	1435Z 20 MAR
	BOCAS_DEL_TORO	9.4N	82.2W	1501Z 20 MAR
ANTIGUA	SAINT_JOHNS	17.1N	61.9W	1431Z 20 MAR
BARBADOS	BRIDGETOWN	13.1N	59.6W	1431Z 20 MAR
BARBUDA	PALMETTO_POINT	17.6N	61.9W	1432Z 20 MAR
BAHAMAS	GREAT_INAGUA	20.9N	73.7W	1434Z 20 MAR
	MAYAGUANA	22.3N	73.0W	1447Z 20 MAR
	LONG_IS	23.3N	75.1W	1505Z 20 MAR
	CROOKED_IS	22.7N	74.1W	1509Z 20 MAR
	SAN_SALVADOR	24.1N	74.5W	1513Z 20 MAR
	ELEUTHERA_IS	25.2N	76.1W	1524Z 20 MAR
	EXUMA	23.6N	75.9W	1525Z 20 MAR
	CAT_IS	24.4N	75.5W	1525Z 20 MAR
	NASSAU	25.1N	77.4W	1537Z 20 MAR
	ANDROS_IS	25.0N	77.9W	1540Z 20 MAR
	FREEPORT	26.5N	78.8W	1558Z 20 MAR
	ABACO_IS	26.6N	77.1W	1612Z 20 MAR
	BIMINI	25.8N	79.3W	1618Z 20 MAR
TURKS N CAICOS	GRAND_TURK	21.5N	71.1W	1439Z 20 MAR
	WEST_CAICOS	21.7N	72.5W	1443Z 20 MAR
CAYMAN BRAC	CAYMAN_ISLANDS	19.7N	79.9W	1440Z 20 MAR
TRINIDAD TOBAGO	PIRATES_BAY	11.3N	60.6W	1445Z 20 MAR

	PORT-OF-SPAIN	10.6N	61.5W	1620Z 20 MAR
COSTA RICA	PUERTO_LIMON	10.0N	83.0W	1453Z 20 MAR
GRAND CAYMAN	CAYMAN_ISLANDS	19.3N	81.3W	1457Z 20 MAR
SAINT MARTIN	BAIE_BLANCHE	18.1N	63.0W	1459Z 20 MAR
NICARAGUA	PUNTA_GORDA	11.4N	83.8W	1541Z 20 MAR
	PUERTO_CABEZAS	14.0N	83.4W	1937Z 20 MAR
BERMUDA	RUTHS_BAY	32.4N	64.6W	1551Z 20 MAR
MEXICO	COZUMEL	20.5N	87.0W	1555Z 20 MAR
	VERACRUZ	19.2N	96.1W	1839Z 20 MAR
	MADERO	22.3N	97.8W	1845Z 20 MAR
	TEXAS_BORDER	26.0N	97.1W	1856Z 20 MAR
	CAMPECHE	19.9N	90.5W	2221Z 20 MAR
HONDURAS	PUERTO_CORTES	15.9N	88.0W	1555Z 20 MAR
	TRUJILLO	15.9N	86.0W	1626Z 20 MAR
BELIZE	BELIZE_CITY	17.5N	88.2W	1635Z 20 MAR
GUATEMALA	PUERTO_BARRIOS	15.7N	88.6W	1819Z 20 MAR
FRENCH GUIANA	CAYENNE	4.9N	52.3W	1843Z 20 MAR
SURINAME	PARAMARIBO	5.9N	55.2W	1850Z 20 MAR
GUYANA	GEORGETOWN	6.8N	58.2W	1851Z 20 MAR
BRAZIL	FORTALEZA	3.7S	38.5W	1934Z 20 MAR
	SAO_LUIS	2.5S	44.3W	2121Z 20 MAR
	ILHA_DE_MARACA	2.2N	50.5W	2200Z 20 MAR

ADDITIONAL BULLETINS WILL BE ISSUED BY THE PACIFIC TSUNAMI
WARNING CENTER FOR THIS EVENT AS MORE INFORMATION
BECOMES AVAILABLE.

PTWC Message #4

WECA41 PHEB 201515
TSUCAX

TSUNAMI MESSAGE NUMBER 4
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1515 UTC WED MAR 20 2013

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

... A CARIBBEAN-WIDE TSUNAMI WATCH IS IN EFFECT ...
... ADDITIONAL TSUNAMI OBSERVATIONS HAVE BEEN MADE ...

A TSUNAMI WATCH IS IN EFFECT FOR

ARUBA / BONAIRE / CURACAO / DOMINICAN REP / VENEZUELA /
COLOMBIA / SAINT KITTS / MONTSERRAT / HAITI / GUADELOUPE /
DOMINICA / SAINT LUCIA / ST VINCENT / SAINT MAARTEN / CUBA /
MARTINIQUE / ANGUILLA / GRENADA / PANAMA / TURKS N CAICOS /
BAHAMAS / BARBADOS / JAMAICA / CAYMAN BRAC / ANTIGUA / BARBUDA /
SAINT MARTIN / GRAND CAYMAN / TRINIDAD TOBAGO / COSTA RICA /
BERMUDA / MEXICO / NICARAGUA / HONDURAS / BELIZE / GUATEMALA /
FRENCH GUIANA / GUYANA / SURINAME / BRAZIL

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1300Z 20 MAR 2013
COORDINATES - 13.4 NORTH 69.9 WEST
LOCATION - CARIBBEAN SEA
MAGNITUDE - 8.5

MEASUREMENTS OR REPORTS OF TSUNAMI WAVE ACTIVITY

GAUGE LOCATION	LAT	LON	TIME	AMPL	PER
DART 42407	15.3N	68.2W	1324Z	0.42M / 1.4FT	20MIN
MONA ISLAND PR	18.1N	67.9W	1355Z	3.77M / 12.2FT	18MIN
PENUELAS PR	18.0N	66.8W	1359Z	1.11M / 3.6FT	16MIN
WILLEMSTAD CURACAO	12.1N	68.9W	1359Z	3.44M / 11.2FT	20MIN
PUNTA CANA DO	18.5N	68.4W	1405Z	4.50M / 14.6FT	20MIN
BARAHONA DO	18.2N	71.1W	1407Z	6.15M / 20.0FT	18MIN
LIMETREE VI	17.7N	64.8W	1411Z	1.41M / 4.6FT	16MIN
YABUCOA PR	18.1N	65.8W	1411Z	0.86M / 2.8FT	22MIN
MAYAGUEZ PR	18.2N	67.2W	1412Z	0.65M / 2.1FT	12MIN
ST CROIX VI	17.7N	64.7W	1417Z	0.84M / 2.7FT	18MIN
MAGUEYES ISLAND PR	18.0N	67.0W	1419Z	2.56M / 8.3FT	24MIN
ESPERANZA VIEQUES PR	18.1N	65.5W	1420Z	0.06M / 1.9FT	16MIN
AGUADILLA PR	18.5N	67.2W	1420Z	1.92M / 6.3FT	19MIN
ARECIBO PR	18.5N	66.7W	1422Z	1.43M / 4.6FT	22MIN
PORT SAN ANDRES DO	18.4N	69.6W	1427Z	13.54M / 44.0FT	14MIN
ROSEAU DM	15.3N	61.4W	1435Z	1.10M / 3.6FT	18MIN
SAN JUAN PR	18.5N	66.1W	1435Z	0.34M / 1.1FT	14MIN
PRICKLEY BAY GD	12.0N	61.8W	1448Z	1.29M / 4.2FT	20MIN
BARBUDA AG	17.9N	61.8W	1450Z	0.21M / 0.7FT	22MIN
PUERTO PLATA DO	19.8N	70.7W	1450Z	0.49M / 1.6FT	22MIN
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1450Z	0.58M / 1.9FT	17MIN
CHARLOTTE-AMALIE VI	18.3N	64.9W	1455Z	0.95M / 3.1FT	24MIN
DESIRADE GUADALOUPE	16.3N	61.1W	1457Z	0.18M / 0.6FT	24MIN
CULEBRA IS PR	18.3N	65.3W	1459Z	1.38M / 4.5FT	20MIN

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).
PER - PERIOD OF TIME IN MINUTES(MIN) FROM ONE WAVE TO THE NEXT.

NOTE - DART MEASUREMENTS ARE FROM THE DEEP OCEAN AND THEY
ARE GENERALLY MUCH SMALLER THAN WOULD BE COASTAL
MEASUREMENTS AT SIMILAR LOCATIONS.

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE ALREADY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE EPICENTER.

BASED ON THESE DATA THE THREAT CONTINUES FOR ALL COASTAL AREAS OF THE CARIBBEAN. FOR THOSE AREAS - WHEN NO MAJOR WAVES HAVE OCCURRED FOR AT LEAST TWO HOURS AFTER THE ESTIMATED ARRIVAL TIME OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI WAVE ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
BONAIRE	ONIMA	12.3N 68.3W	1310Z 20 MAR

ARUBA	ORANJESTAD	12.5N	70.0W	1314Z 20 MAR
CURACAO	WILLEMSTAD	12.1N	68.9W	1326Z 20 MAR
COLOMBIA	SANTA_MARTA	11.2N	74.2W	1337Z 20 MAR
	RIOHACHA	11.6N	72.9W	1348Z 20 MAR
	BARRANQUILLA	11.1N	74.9W	1350Z 20 MAR
	CARTAGENA	10.4N	75.6W	1352Z 20 MAR
	PUNTA_CARIBANA	8.6N	76.9W	1426Z 20 MAR
VENEZUELA	MAIQUETIA	10.6N	67.0W	1339Z 20 MAR
	CUMANA	10.5N	64.2W	1423Z 20 MAR
	PUNTO_FIJO	11.7N	70.2W	1522Z 20 MAR
	GOLFO_VENEZUELA	11.4N	71.2W	1635Z 20 MAR
	PORLAMAR	10.9N	63.8W	1736Z 20 MAR
DOMINICAN REP	SANTO_DOMINGO	18.5N	69.9W	1350Z 20 MAR
	CABO_ENGANO	18.6N	68.3W	1356Z 20 MAR
	PUERTO_PLATA	19.8N	70.7W	1433Z 20 MAR
MONTSERRAT	PLYMOUTH	16.7N	62.2W	1404Z 20 MAR
SAINT LUCIA	CASTRIES	14.0N	61.0W	1404Z 20 MAR
GUADELOUPE	BASSE-TERRE	16.0N	61.7W	1405Z 20 MAR
HAITI	JEREMIE	18.6N	74.1W	1409Z 20 MAR
	CAP-HAITEN	19.8N	72.2W	1441Z 20 MAR
	PORT-AU-PRINCE	18.5N	72.4W	1507Z 20 MAR
GRENADA	SAINT_GEORGES	12.0N	61.8W	1410Z 20 MAR
DOMINICA	ROSEAU	15.3N	61.4W	1410Z 20 MAR
SAINT KITTS	BASSETERRE	17.3N	62.7W	1413Z 20 MAR
CUBA	SANTIAGO_D_CUBA	19.9N	75.8W	1413Z 20 MAR
	BARACOA	20.4N	74.5W	1429Z 20 MAR
	GIBARA	21.1N	76.1W	1457Z 20 MAR
	CIENFUEGOS	22.0N	80.5W	1504Z 20 MAR
	LA_HABANA	23.2N	82.4W	1614Z 20 MAR
	SANTA_CRZ_D_SUR	20.7N	78.0W	1731Z 20 MAR
	NUEVA_GERONA	21.9N	82.8W	1834Z 20 MAR
SAINT MAARTEN	SIMPSON_BAAI	18.0N	63.1W	1413Z 20 MAR
MARTINIQUE	FORT-DE-FRANCE	14.6N	61.1W	1414Z 20 MAR
ST VINCENT	KINGSTOWN	13.1N	61.2W	1416Z 20 MAR
JAMAICA	KINGSTON	17.9N	76.9W	1419Z 20 MAR
	MONTEGO_BAY	18.5N	77.9W	1428Z 20 MAR
ANGUILLA	THE_VALLEY	18.3N	63.1W	1419Z 20 MAR
PANAMA	PUERTO_CARRETO	8.8N	77.6W	1424Z 20 MAR
	ALIGANDI	9.2N	78.0W	1426Z 20 MAR
	PUERTO_OBALDIA	8.7N	77.4W	1427Z 20 MAR
	COLON	9.4N	79.9W	1435Z 20 MAR
	BOCAS_DEL_TORO	9.4N	82.2W	1501Z 20 MAR
ANTIGUA	SAINT_JOHNS	17.1N	61.9W	1431Z 20 MAR
BARBADOS	BRIDGETOWN	13.1N	59.6W	1431Z 20 MAR
BARBUDA	PALMETTO_POINT	17.6N	61.9W	1432Z 20 MAR
BAHAMAS	GREAT_INAGUA	20.9N	73.7W	1434Z 20 MAR
	MAYAGUANA	22.3N	73.0W	1447Z 20 MAR
	LONG_IS	23.3N	75.1W	1505Z 20 MAR
	CROOKED_IS	22.7N	74.1W	1509Z 20 MAR
	SAN_SALVADOR	24.1N	74.5W	1513Z 20 MAR
	ELEUTHERA_IS	25.2N	76.1W	1524Z 20 MAR
	EXUMA	23.6N	75.9W	1525Z 20 MAR
	CAT_IS	24.4N	75.5W	1525Z 20 MAR
	NASSAU	25.1N	77.4W	1537Z 20 MAR
	ANDROS_IS	25.0N	77.9W	1540Z 20 MAR
	FREEPORT	26.5N	78.8W	1558Z 20 MAR
	ABACO_IS	26.6N	77.1W	1612Z 20 MAR
	BIMINI	25.8N	79.3W	1618Z 20 MAR
TURKS N CAICOS	GRAND_TURK	21.5N	71.1W	1439Z 20 MAR
	WEST_CAICOS	21.7N	72.5W	1443Z 20 MAR
CAYMAN BRAC	CAYMAN_ISLANDS	19.7N	79.9W	1440Z 20 MAR

TRINIDAD TOBAGO	PIRATES_BAY	11.3N	60.6W	1445Z 20 MAR
	PORT-OF-SPAIN	10.6N	61.5W	1620Z 20 MAR
COSTA RICA	PUERTO_LIMON	10.0N	83.0W	1453Z 20 MAR
GRAND CAYMAN	CAYMAN_ISLANDS	19.3N	81.3W	1457Z 20 MAR
SAINT MARTIN	BAIE_BLANCHE	18.1N	63.0W	1459Z 20 MAR
NICARAGUA	PUNTA_GORDA	11.4N	83.8W	1541Z 20 MAR
	PUERTO_CABEZAS	14.0N	83.4W	1937Z 20 MAR
BERMUDA	RUTHS_BAY	32.4N	64.6W	1551Z 20 MAR
MEXICO	COZUMEL	20.5N	87.0W	1555Z 20 MAR
	VERACRUZ	19.2N	96.1W	1839Z 20 MAR
	MADERO	22.3N	97.8W	1845Z 20 MAR
	TEXAS_BORDER	26.0N	97.1W	1856Z 20 MAR
	CAMPECHE	19.9N	90.5W	2221Z 20 MAR
HONDURAS	PUERTO_CORTES	15.9N	88.0W	1555Z 20 MAR
	TRUJILLO	15.9N	86.0W	1626Z 20 MAR
BELIZE	BELIZE_CITY	17.5N	88.2W	1635Z 20 MAR
GUATEMALA	PUERTO_BARRIOS	15.7N	88.6W	1819Z 20 MAR
FRENCH GUIANA	CAYENNE	4.9N	52.3W	1843Z 20 MAR
SURINAME	PARAMARIBO	5.9N	55.2W	1850Z 20 MAR
GUYANA	GEORGETOWN	6.8N	58.2W	1851Z 20 MAR
BRAZIL	FORTALEZA	3.7S	38.5W	1934Z 20 MAR
	SAO_LUIS	2.5S	44.3W	2121Z 20 MAR
	ILHA_DE_MARACA	2.2N	50.5W	2200Z 20 MAR

ADDITIONAL BULLETINS WILL BE ISSUED BY THE PACIFIC TSUNAMI
WARNING CENTER FOR THIS EVENT AS MORE INFORMATION
BECOMES AVAILABLE.

PTWC Message #5

WECA41 PHEB 201610
TSUCAX

TSUNAMI MESSAGE NUMBER 5
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1610 UTC WED MAR 20 2013

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

... A CARIBBEAN-WIDE TSUNAMI WATCH IS IN EFFECT ...
... ADDITIONAL TSUNAMI OBSERVATIONS HAVE BEEN MADE ...

A TSUNAMI WATCH IS IN EFFECT FOR

ARUBA / BONAIRE / CURACAO / DOMINICAN REP / VENEZUELA /
COLOMBIA / SAINT KITTS / MONTSERRAT / HAITI / GUADELOUPE /
DOMINICA / SAINT LUCIA / ST VINCENT / SAINT MAARTEN / CUBA /
MARTINIQUE / ANGUILLA / GRENADA / PANAMA / TURKS N CAICOS /
BAHAMAS / BARBADOS / JAMAICA / CAYMAN BRAC / ANTIGUA / BARBUDA /
SAINT MARTIN / GRAND CAYMAN / TRINIDAD TOBAGO / COSTA RICA /
BERMUDA / MEXICO / NICARAGUA / HONDURAS / BELIZE / GUATEMALA /
FRENCH GUIANA / GUYANA / SURINAME / BRAZIL

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NATIONAL AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE
DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND
ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1300Z 20 MAR 2013
COORDINATES - 13.4 NORTH 69.9 WEST
LOCATION - CARIBBEAN SEA

MAGNITUDE - 8.5

MEASUREMENTS OR REPORTS OF TSUNAMI WAVE ACTIVITY

GAUGE LOCATION	LAT	LON	TIME	AMPL	PER
DART 42407	15.3N	68.2W	1324Z	0.42M / 1.4FT	20MIN
MONA ISLAND PR	18.1N	67.9W	1355Z	3.77M / 12.2FT	18MIN
PENUELAS PR	18.0N	66.8W	1359Z	1.11M / 3.6FT	16MIN
WILLEMSTAD CURACAO	12.1N	68.9W	1359Z	3.44M / 11.2FT	20MIN
PUNTA CANA DO	18.5N	68.4W	1405Z	4.50M / 14.6FT	20MIN
BARAHONA DO	18.2N	71.1W	1407Z	6.15M / 20.0FT	18MIN
LIMETREE VI	17.7N	64.8W	1411Z	1.41M / 4.6FT	16MIN
YABUCOA PR	18.1N	65.8W	1411Z	0.86M / 2.8FT	22MIN
MAYAGUEZ PR	18.2N	67.2W	1412Z	0.65M / 2.1FT	12MIN
ST CROIX VI	17.7N	64.7W	1417Z	0.84M / 2.7FT	18MIN
MAGUEYES ISLAND PR	18.0N	67.0W	1419Z	2.56M / 8.3FT	24MIN
ESPERANZA VIEQUES PR	18.1N	65.5W	1420Z	0.06M / 1.9FT	16MIN
AGUADILLA PR	18.5N	67.2W	1420Z	1.92M / 6.3FT	19MIN
ARECIBO PR	18.5N	66.7W	1422Z	1.43M / 4.6FT	22MIN
PORT SAN ANDRES DO	18.4N	69.6W	1427Z	13.54M / 44.0FT	14MIN
ROSEAU DM	15.3N	61.4W	1435Z	1.10M / 3.6FT	18MIN
SAN JUAN PR	18.5N	66.1W	1435Z	0.34M / 1.1FT	14MIN
PRICKLEY BAY GD	12.0N	61.8W	1448Z	1.29M / 4.2FT	20MIN
BARBUDA AG	17.9N	61.8W	1450Z	0.21M / 0.7FT	22MIN
PUERTO PLATA DO	19.8N	70.7W	1450Z	0.49M / 1.6FT	22MIN
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1450Z	0.58M / 1.9FT	17MIN
CHARLOTTE-AMALIE VI	18.3N	64.9W	1455Z	0.95M / 3.1FT	24MIN
DESIRADE GUADALOUPE	16.3N	61.1W	1457Z	0.18M / 0.6FT	24MIN
CULEBRA IS PR	18.3N	65.3W	1459Z	1.38M / 4.5FT	20MIN
CAP HAITIEN HT	19.8N	72.2W	1511Z	0.14M / 0.5FT	23MIN
FAJARDO PR	18.3N	65.6W	1518Z	1.21M / 3.9FT	22MIN
LIMON CR	10.0N	83.0W	1530Z	0.74M / 2.4FT	26MIN

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).
PER - PERIOD OF TIME IN MINUTES(MIN) FROM ONE WAVE TO THE NEXT.

NOTE - DART MEASUREMENTS ARE FROM THE DEEP OCEAN AND THEY
ARE GENERALLY MUCH SMALLER THAN WOULD BE COASTAL
MEASUREMENTS AT SIMILAR LOCATIONS.

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE ALREADY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE EPICENTER.

BASED ON THESE DATA THE THREAT CONTINUES FOR ALL COASTAL AREAS OF THE CARIBBEAN. FOR THOSE AREAS - WHEN NO MAJOR WAVES HAVE OCCURRED FOR AT LEAST TWO HOURS AFTER THE ESTIMATED ARRIVAL TIME OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI WAVE ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
BONAIRE	ONIMA	12.3N 68.3W	1310Z 20 MAR
ARUBA	ORANJESTAD	12.5N 70.0W	1314Z 20 MAR
CURACAO	WILLEMSTAD	12.1N 68.9W	1326Z 20 MAR
COLOMBIA	SANTA_MARTA	11.2N 74.2W	1337Z 20 MAR
	RIOHACHA	11.6N 72.9W	1348Z 20 MAR
	BARRANQUILLA	11.1N 74.9W	1350Z 20 MAR
	CARTAGENA	10.4N 75.6W	1352Z 20 MAR
	PUNTA_CARIBANA	8.6N 76.9W	1426Z 20 MAR
VENEZUELA	MAIQUETIA	10.6N 67.0W	1339Z 20 MAR
	CUMANA	10.5N 64.2W	1423Z 20 MAR
	PUNTO_FIJO	11.7N 70.2W	1522Z 20 MAR
	GOLFO_VENEZUELA	11.4N 71.2W	1635Z 20 MAR
	PORLAMAR	10.9N 63.8W	1736Z 20 MAR
DOMINICAN REP	SANTO_DOMINGO	18.5N 69.9W	1350Z 20 MAR
	CABO_ENGANO	18.6N 68.3W	1356Z 20 MAR
	PUERTO_PLATA	19.8N 70.7W	1433Z 20 MAR
MONTSERRAT	PLYMOUTH	16.7N 62.2W	1404Z 20 MAR
SAINT LUCIA	CASTRIES	14.0N 61.0W	1404Z 20 MAR
GUADELOUPE	BASSE-TERRE	16.0N 61.7W	1405Z 20 MAR
HAITI	JEREMIE	18.6N 74.1W	1409Z 20 MAR
	CAP-HAITEN	19.8N 72.2W	1441Z 20 MAR
	PORT-AU-PRINCE	18.5N 72.4W	1507Z 20 MAR
GRENADA	SAINT_GEORGES	12.0N 61.8W	1410Z 20 MAR
DOMINICA	ROSEAU	15.3N 61.4W	1410Z 20 MAR
SAINT KITTS	BASSETERRE	17.3N 62.7W	1413Z 20 MAR
CUBA	SANTIAGO_D_CUBA	19.9N 75.8W	1413Z 20 MAR
	BARACOA	20.4N 74.5W	1429Z 20 MAR
	GIBARA	21.1N 76.1W	1457Z 20 MAR
	CIENFUEGOS	22.0N 80.5W	1504Z 20 MAR
	LA_HABANA	23.2N 82.4W	1614Z 20 MAR
	SANTA_CRZ_D_SUR	20.7N 78.0W	1731Z 20 MAR
	NUEVA_GERONA	21.9N 82.8W	1834Z 20 MAR
SAINT MAARTEN	SIMPSON_BAAI	18.0N 63.1W	1413Z 20 MAR
MARTINIQUE	FORT-DE-FRANCE	14.6N 61.1W	1414Z 20 MAR
ST VINCENT	KINGSTOWN	13.1N 61.2W	1416Z 20 MAR
JAMAICA	KINGSTON	17.9N 76.9W	1419Z 20 MAR
	MONTEGO_BAY	18.5N 77.9W	1428Z 20 MAR
ANGUILLA	THE_VALLEY	18.3N 63.1W	1419Z 20 MAR
PANAMA	PUERTO_CARRETO	8.8N 77.6W	1424Z 20 MAR
	ALIGANDI	9.2N 78.0W	1426Z 20 MAR
	PUERTO_OBALDIA	8.7N 77.4W	1427Z 20 MAR
	COLON	9.4N 79.9W	1435Z 20 MAR
	BOCAS_DEL_TORO	9.4N 82.2W	1501Z 20 MAR
ANTIGUA	SAINT_JOHNS	17.1N 61.9W	1431Z 20 MAR
BARBADOS	BRIDGETOWN	13.1N 59.6W	1431Z 20 MAR
BARBUDA	PALMETTO_POINT	17.6N 61.9W	1432Z 20 MAR
BAHAMAS	GREAT_INAGUA	20.9N 73.7W	1434Z 20 MAR
	MAYAGUANA	22.3N 73.0W	1447Z 20 MAR
	LONG_IS	23.3N 75.1W	1505Z 20 MAR
	CROOKED_IS	22.7N 74.1W	1509Z 20 MAR
	SAN_SALVADOR	24.1N 74.5W	1513Z 20 MAR
	ELEUTHERA_IS	25.2N 76.1W	1524Z 20 MAR
	EXUMA	23.6N 75.9W	1525Z 20 MAR
	CAT_IS	24.4N 75.5W	1525Z 20 MAR
	NASSAU	25.1N 77.4W	1537Z 20 MAR
	ANDROS_IS	25.0N 77.9W	1540Z 20 MAR
	FREEPORT	26.5N 78.8W	1558Z 20 MAR
	ABACO_IS	26.6N 77.1W	1612Z 20 MAR

	BIMINI	25.8N	79.3W	1618Z 20 MAR
TURKS N CAICOS	GRAND_TURK	21.5N	71.1W	1439Z 20 MAR
	WEST_CAICOS	21.7N	72.5W	1443Z 20 MAR
CAYMAN BRAC	CAYMAN_ISLANDS	19.7N	79.9W	1440Z 20 MAR
TRINIDAD TOBAGO	PIRATES_BAY	11.3N	60.6W	1445Z 20 MAR
	PORT-OF-SPAIN	10.6N	61.5W	1620Z 20 MAR
COSTA RICA	PUERTO_LIMON	10.0N	83.0W	1453Z 20 MAR
GRAND CAYMAN	CAYMAN_ISLANDS	19.3N	81.3W	1457Z 20 MAR
SAINT MARTIN	BAIE_BLANCHE	18.1N	63.0W	1459Z 20 MAR
NICARAGUA	PUNTA_GORDA	11.4N	83.8W	1541Z 20 MAR
	PUERTO_CABEZAS	14.0N	83.4W	1937Z 20 MAR
BERMUDA	RUTHS_BAY	32.4N	64.6W	1551Z 20 MAR
MEXICO	COZUMEL	20.5N	87.0W	1555Z 20 MAR
	VERACRUZ	19.2N	96.1W	1839Z 20 MAR
	MADERO	22.3N	97.8W	1845Z 20 MAR
	TEXAS_BORDER	26.0N	97.1W	1856Z 20 MAR
	CAMPECHE	19.9N	90.5W	2221Z 20 MAR
HONDURAS	PUERTO_CORTES	15.9N	88.0W	1555Z 20 MAR
	TRUJILLO	15.9N	86.0W	1626Z 20 MAR
BELIZE	BELIZE_CITY	17.5N	88.2W	1635Z 20 MAR
GUATEMALA	PUERTO_BARRIOS	15.7N	88.6W	1819Z 20 MAR
FRENCH GUIANA	CAYENNE	4.9N	52.3W	1843Z 20 MAR
SURINAME	PARAMARIBO	5.9N	55.2W	1850Z 20 MAR
GUYANA	GEORGETOWN	6.8N	58.2W	1851Z 20 MAR
BRAZIL	FORTALEZA	3.7S	38.5W	1934Z 20 MAR
	SAO_LUIS	2.5S	44.3W	2121Z 20 MAR
	ILHA_DE_MARACA	2.2N	50.5W	2200Z 20 MAR

ADDITIONAL BULLETINS WILL BE ISSUED BY THE PACIFIC TSUNAMI
WARNING CENTER FOR THIS EVENT AS MORE INFORMATION
BECOMES AVAILABLE.

PTWC Message #6

WECA41 PHEB 201710
TSUCAX

TSUNAMI MESSAGE NUMBER 6
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1710 UTC WED MAR 20 2013

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

... A CARIBBEAN-WIDE TSUNAMI WATCH IS IN EFFECT ...

A TSUNAMI WATCH IS IN EFFECT FOR

ARUBA / BONAIRE / CURACAO / DOMINICAN REP / VENEZUELA /
COLOMBIA / SAINT KITTS / MONTSERRAT / HAITI / GUADELOUPE /
DOMINICA / SAINT LUCIA / ST VINCENT / SAINT MAARTEN / CUBA /
MARTINIQUE / ANGUILLA / GRENADA / PANAMA / TURKS N CAICOS /
BAHAMAS / BARBADOS / JAMAICA / CAYMAN BRAC / ANTIGUA / BARBUDA /
SAINT MARTIN / GRAND CAYMAN / TRINIDAD TOBAGO / COSTA RICA /
BERMUDA / MEXICO / NICARAGUA / HONDURAS / BELIZE / GUATEMALA /
FRENCH GUIANA / GUYANA / SURINAME / BRAZIL

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1300Z 20 MAR 2013
COORDINATES - 13.4 NORTH 69.9 WEST
LOCATION - CARIBBEAN SEA
MAGNITUDE - 8.5

MEASUREMENTS OR REPORTS OF TSUNAMI WAVE ACTIVITY

GAUGE LOCATION	LAT	LON	TIME	AMPL	PER
DART 42407	15.3N	68.2W	1324Z	0.42M / 1.4FT	20MIN
MONA ISLAND PR	18.1N	67.9W	1355Z	3.77M / 12.2FT	18MIN
PENUELAS PR	18.0N	66.8W	1359Z	1.11M / 3.6FT	16MIN
WILLEMSTAD CURACAO	12.1N	68.9W	1359Z	3.44M / 11.2FT	20MIN
PUNTA CANA DO	18.5N	68.4W	1405Z	4.50M / 14.6FT	20MIN
BARAHONA DO	18.2N	71.1W	1407Z	6.15M / 20.0FT	18MIN
LIMETREE VI	17.7N	64.8W	1411Z	1.41M / 4.6FT	16MIN
YABUCOA PR	18.1N	65.8W	1411Z	0.86M / 2.8FT	22MIN
MAYAGUEZ PR	18.2N	67.2W	1412Z	0.65M / 2.1FT	12MIN
ST CROIX VI	17.7N	64.7W	1417Z	0.84M / 2.7FT	18MIN
MAGUEYES ISLAND PR	18.0N	67.0W	1419Z	2.56M / 8.3FT	24MIN
ESPERANZA VIEQUES PR	18.1N	65.5W	1420Z	0.06M / 1.9FT	16MIN
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ROSEAU DM	15.3N	61.4W	1435Z	1.10M / 3.6FT	18MIN
SAN JUAN PR	18.5N	66.1W	1435Z	0.34M / 1.1FT	14MIN
PRICKLEY BAY GD	12.0N	61.8W	1448Z	1.29M / 4.2FT	20MIN
BARBUDA AG	17.9N	61.8W	1450Z	0.21M / 0.7FT	22MIN
PUERTO PLATA DO	19.8N	70.7W	1450Z	0.49M / 1.6FT	22MIN
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1450Z	0.58M / 1.9FT	17MIN
CHARLOTTE-AMALIE VI	18.3N	64.9W	1455Z	0.95M / 3.1FT	24MIN
DESIRADE GUADALOUPE	16.3N	61.1W	1457Z	0.18M / 0.6FT	24MIN
CULEBRA IS PR	18.3N	65.3W	1459Z	1.38M / 4.5FT	20MIN
CAP HAITIEN HT	19.8N	72.2W	1511Z	0.14M / 0.5FT	23MIN
FAJARDO PR	18.3N	65.6W	1518Z	1.21M / 3.9FT	22MIN
LIMON CR	10.0N	83.0W	1530Z	0.74M / 2.4FT	26MIN

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).
PER - PERIOD OF TIME IN MINUTES(MIN) FROM ONE WAVE TO THE NEXT.

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BASED ON THESE DATA THE THREAT CONTINUES FOR ALL COASTAL AREAS OF THE CARIBBEAN. FOR THOSE AREAS - WHEN NO MAJOR WAVES HAVE OCCURRED FOR AT LEAST TWO HOURS AFTER THE ESTIMATED ARRIVAL TIME OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI WAVE ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS

WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
BONAIRE	ONIMA	12.3N 68.3W	1310Z 20 MAR
ARUBA	ORANJESTAD	12.5N 70.0W	1314Z 20 MAR
CURACAO	WILLEMSTAD	12.1N 68.9W	1326Z 20 MAR
COLOMBIA	SANTA_MARTA	11.2N 74.2W	1337Z 20 MAR
	RIOHACHA	11.6N 72.9W	1348Z 20 MAR
	BARRANQUILLA	11.1N 74.9W	1350Z 20 MAR
	CARTAGENA	10.4N 75.6W	1352Z 20 MAR
	PUNTA_CARIBANA	8.6N 76.9W	1426Z 20 MAR
VENEZUELA	MAIQUETIA	10.6N 67.0W	1339Z 20 MAR
	CUMANA	10.5N 64.2W	1423Z 20 MAR
	PUNTO_FIJO	11.7N 70.2W	1522Z 20 MAR
	GOLFO_VENEZUELA	11.4N 71.2W	1635Z 20 MAR
	PORLAMAR	10.9N 63.8W	1736Z 20 MAR
DOMINICAN REP	SANTO_DOMINGO	18.5N 69.9W	1350Z 20 MAR
	CABO_ENGANO	18.6N 68.3W	1356Z 20 MAR
	PUERTO_PLATA	19.8N 70.7W	1433Z 20 MAR
MONTSERRAT	PLYMOUTH	16.7N 62.2W	1404Z 20 MAR
SAINT LUCIA	CASTRIES	14.0N 61.0W	1404Z 20 MAR
GUADELOUPE	BASSE-TERRE	16.0N 61.7W	1405Z 20 MAR
HAITI	JEREMIE	18.6N 74.1W	1409Z 20 MAR
	CAP-HAITEN	19.8N 72.2W	1441Z 20 MAR
	PORT-AU-PRINCE	18.5N 72.4W	1507Z 20 MAR
GRENADA	SAINT_GEORGES	12.0N 61.8W	1410Z 20 MAR
DOMINICA	ROSEAU	15.3N 61.4W	1410Z 20 MAR
SAINT KITTS	BASSETERRE	17.3N 62.7W	1413Z 20 MAR
CUBA	SANTIAGO_D_CUBA	19.9N 75.8W	1413Z 20 MAR
	BARACOA	20.4N 74.5W	1429Z 20 MAR
	GIBARA	21.1N 76.1W	1457Z 20 MAR
	CIENFUEGOS	22.0N 80.5W	1504Z 20 MAR
	LA_HABANA	23.2N 82.4W	1614Z 20 MAR
	SANTA_CRZ_D_SUR	20.7N 78.0W	1731Z 20 MAR
	NUEVA_GERONA	21.9N 82.8W	1834Z 20 MAR
SAINT MAARTEN	SIMPSON_BAAI	18.0N 63.1W	1413Z 20 MAR
MARTINIQUE	FORT-DE-FRANCE	14.6N 61.1W	1414Z 20 MAR
ST VINCENT	KINGSTOWN	13.1N 61.2W	1416Z 20 MAR
JAMAICA	KINGSTON	17.9N 76.9W	1419Z 20 MAR
	MONTEGO_BAY	18.5N 77.9W	1428Z 20 MAR
ANGUILLA	THE_VALLEY	18.3N 63.1W	1419Z 20 MAR
PANAMA	PUERTO_CARRETO	8.8N 77.6W	1424Z 20 MAR
	ALIGANDI	9.2N 78.0W	1426Z 20 MAR
	PUERTO_OBALDIA	8.7N 77.4W	1427Z 20 MAR
	COLON	9.4N 79.9W	1435Z 20 MAR
	BOCAS_DEL_TORO	9.4N 82.2W	1501Z 20 MAR
ANTIGUA	SAINT_JOHNS	17.1N 61.9W	1431Z 20 MAR
BARBADOS	BRIDGETOWN	13.1N 59.6W	1431Z 20 MAR
BARBUDA	PALMETTO_POINT	17.6N 61.9W	1432Z 20 MAR
BAHAMAS	GREAT_INAGUA	20.9N 73.7W	1434Z 20 MAR
	MAYAGUANA	22.3N 73.0W	1447Z 20 MAR
	LONG_IS	23.3N 75.1W	1505Z 20 MAR
	CROOKED_IS	22.7N 74.1W	1509Z 20 MAR
	SAN_SALVADOR	24.1N 74.5W	1513Z 20 MAR
	ELEUTHERA_IS	25.2N 76.1W	1524Z 20 MAR
	EXUMA	23.6N 75.9W	1525Z 20 MAR
	CAT_IS	24.4N 75.5W	1525Z 20 MAR

	NASSAU	25.1N	77.4W	1537Z 20 MAR
	ANDROS_IS	25.0N	77.9W	1540Z 20 MAR
	FREEPORT	26.5N	78.8W	1558Z 20 MAR
	ABACO_IS	26.6N	77.1W	1612Z 20 MAR
	BIMINI	25.8N	79.3W	1618Z 20 MAR
TURKS N CAICOS	GRAND_TURK	21.5N	71.1W	1439Z 20 MAR
	WEST_CAICOS	21.7N	72.5W	1443Z 20 MAR
CAYMAN BRAC	CAYMAN_ISLANDS	19.7N	79.9W	1440Z 20 MAR
TRINIDAD TOBAGO	PIRATES_BAY	11.3N	60.6W	1445Z 20 MAR
	PORT-OF-SPAIN	10.6N	61.5W	1620Z 20 MAR
COSTA RICA	PUERTO_LIMON	10.0N	83.0W	1453Z 20 MAR
GRAND CAYMAN	CAYMAN_ISLANDS	19.3N	81.3W	1457Z 20 MAR
SAINT MARTIN	BAIE_BLANCHE	18.1N	63.0W	1459Z 20 MAR
NICARAGUA	PUNTA_GORDA	11.4N	83.8W	1541Z 20 MAR
	PUERTO_CABEZAS	14.0N	83.4W	1937Z 20 MAR
BERMUDA	RUTHS_BAY	32.4N	64.6W	1551Z 20 MAR
MEXICO	COZUMEL	20.5N	87.0W	1555Z 20 MAR
	VERACRUZ	19.2N	96.1W	1839Z 20 MAR
	MADERO	22.3N	97.8W	1845Z 20 MAR
	TEXAS_BORDER	26.0N	97.1W	1856Z 20 MAR
	CAMPECHE	19.9N	90.5W	2221Z 20 MAR
HONDURAS	PUERTO_CORTES	15.9N	88.0W	1555Z 20 MAR
	TRUJILLO	15.9N	86.0W	1626Z 20 MAR
BELIZE	BELIZE_CITY	17.5N	88.2W	1635Z 20 MAR
GUATEMALA	PUERTO_BARRIOS	15.7N	88.6W	1819Z 20 MAR
FRENCH GUIANA	CAYENNE	4.9N	52.3W	1843Z 20 MAR
SURINAME	PARAMARIBO	5.9N	55.2W	1850Z 20 MAR
GUYANA	GEORGETOWN	6.8N	58.2W	1851Z 20 MAR
BRAZIL	FORTALEZA	3.7S	38.5W	1934Z 20 MAR
	SAO_LUIS	2.5S	44.3W	2121Z 20 MAR
	ILHA_DE_MARACA	2.2N	50.5W	2200Z 20 MAR

ADDITIONAL BULLETINS WILL BE ISSUED BY THE PACIFIC TSUNAMI
WARNING CENTER FOR THIS EVENT AS MORE INFORMATION
BECOMES AVAILABLE.

PTWC Message #7

WECA41 PHEB 201810
TSUCAX

TSUNAMI MESSAGE NUMBER 7
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1810 UTC WED MAR 20 2013

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A TSUNAMI WATCH IS IN EFFECT FOR

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COLOMBIA / SAINT KITTS / MONTSERRAT / HAITI / GUADELOUPE /
DOMINICA / SAINT LUCIA / ST VINCENT / SAINT MAARTEN / CUBA /
MARTINIQUE / ANGUILLA / GRENADA / PANAMA / TURKS N CAICOS /
BAHAMAS / BARBADOS / JAMAICA / CAYMAN BRAC / ANTIGUA / BARBUDA /
SAINT MARTIN / GRAND CAYMAN / TRINIDAD TOBAGO / COSTA RICA /
BERMUDA / MEXICO / NICARAGUA / HONDURAS / BELIZE / GUATEMALA /
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DECISIONS REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND
ANY ACTIONS TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1300Z 20 MAR 2013
COORDINATES - 13.4 NORTH 69.9 WEST
LOCATION - CARIBBEAN SEA
MAGNITUDE - 8.5

MEASUREMENTS OR REPORTS OF TSUNAMI WAVE ACTIVITY

GAUGE LOCATION	LAT	LON	TIME	AMPL	PER
DART 42407	15.3N	68.2W	1324Z	0.42M / 1.4FT	20MIN
MONA ISLAND PR	18.1N	67.9W	1355Z	3.77M / 12.2FT	18MIN
PENUELAS PR	18.0N	66.8W	1359Z	1.11M / 3.6FT	16MIN
WILLEMSTAD CURACAO	12.1N	68.9W	1359Z	3.44M / 11.2FT	20MIN
PUNTA CANA DO	18.5N	68.4W	1405Z	4.50M / 14.6FT	20MIN
BARAHONA DO	18.2N	71.1W	1407Z	6.15M / 20.0FT	18MIN
LIMETREE VI	17.7N	64.8W	1411Z	1.41M / 4.6FT	16MIN
YABUCOA PR	18.1N	65.8W	1411Z	0.86M / 2.8FT	22MIN
MAYAGUEZ PR	18.2N	67.2W	1412Z	0.65M / 2.1FT	12MIN
ST CROIX VI	17.7N	64.7W	1417Z	0.84M / 2.7FT	18MIN
MAGUEYES ISLAND PR	18.0N	67.0W	1419Z	2.56M / 8.3FT	24MIN
ESPERANZA VIEQUES PR	18.1N	65.5W	1420Z	0.06M / 1.9FT	16MIN
AGUADILLA PR	18.5N	67.2W	1420Z	1.92M / 6.3FT	19MIN
ARECIBO PR	18.5N	66.7W	1422Z	1.43M / 4.6FT	22MIN
PORT SAN ANDRES DO	18.4N	69.6W	1427Z	13.54M / 44.0FT	14MIN
ROSEAU DM	15.3N	61.4W	1435Z	1.10M / 3.6FT	18MIN
SAN JUAN PR	18.5N	66.1W	1435Z	0.34M / 1.1FT	14MIN
PRICKLEY BAY GD	12.0N	61.8W	1448Z	1.29M / 4.2FT	20MIN
BARBUDA AG	17.9N	61.8W	1450Z	0.21M / 0.7FT	22MIN
PUERTO PLATA DO	19.8N	70.7W	1450Z	0.49M / 1.6FT	22MIN
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1450Z	0.58M / 1.9FT	17MIN
CHARLOTTE-AMALIE VI	18.3N	64.9W	1455Z	0.95M / 3.1FT	24MIN
DESIRADE GUADALOUPE	16.3N	61.1W	1457Z	0.18M / 0.6FT	24MIN
CULEBRA IS PR	18.3N	65.3W	1459Z	1.38M / 4.5FT	20MIN
CAP HAITIEN HT	19.8N	72.2W	1511Z	0.14M / 0.5FT	23MIN
FAJARDO PR	18.3N	65.6W	1518Z	1.21M / 3.9FT	22MIN
LIMON CR	10.0N	83.0W	1530Z	0.74M / 2.4FT	26MIN

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).
PER - PERIOD OF TIME IN MINUTES(MIN) FROM ONE WAVE TO THE NEXT.

NOTE - DART MEASUREMENTS ARE FROM THE DEEP OCEAN AND THEY
ARE GENERALLY MUCH SMALLER THAN WOULD BE COASTAL
MEASUREMENTS AT SIMILAR LOCATIONS.

EVALUATION

SEA LEVEL READINGS INDICATE A TSUNAMI WAS GENERATED. IT MAY HAVE
ALREADY HAVE BEEN DESTRUCTIVE ALONG COASTS NEAR THE EARTHQUAKE
EPICENTER.

BASED ON THESE DATA THE THREAT CONTINUES FOR ALL COASTAL AREAS OF
THE CARIBBEAN. FOR THOSE AREAS - WHEN NO MAJOR WAVES HAVE
OCCURRED FOR AT LEAST TWO HOURS AFTER THE ESTIMATED ARRIVAL TIME
OR DAMAGING WAVES HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN
LOCAL AUTHORITIES CAN ASSUME THE THREAT IS PASSED. DANGER TO
BOATS AND COASTAL STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE
TO RAPID CURRENTS. AS LOCAL CONDITIONS CAN CAUSE A WIDE

VARIATION IN TSUNAMI WAVE ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL AUTHORITIES.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS WITHIN THE WARNING AND WATCH AREAS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME
BONAIRE	ONIMA	12.3N 68.3W	1310Z 20 MAR
ARUBA	ORANJESTAD	12.5N 70.0W	1314Z 20 MAR
CURACAO	WILLEMSTAD	12.1N 68.9W	1326Z 20 MAR
COLOMBIA	SANTA_MARTA	11.2N 74.2W	1337Z 20 MAR
	RIOHACHA	11.6N 72.9W	1348Z 20 MAR
	BARRANQUILLA	11.1N 74.9W	1350Z 20 MAR
	CARTAGENA	10.4N 75.6W	1352Z 20 MAR
	PUNTA_CARIBANA	8.6N 76.9W	1426Z 20 MAR
VENEZUELA	MAIQUETIA	10.6N 67.0W	1339Z 20 MAR
	CUMANA	10.5N 64.2W	1423Z 20 MAR
	PUNTO_FIJO	11.7N 70.2W	1522Z 20 MAR
	GOLFO_VENEZUELA	11.4N 71.2W	1635Z 20 MAR
	PORLAMAR	10.9N 63.8W	1736Z 20 MAR
DOMINICAN REP	SANTO_DOMINGO	18.5N 69.9W	1350Z 20 MAR
	CABO_ENGANO	18.6N 68.3W	1356Z 20 MAR
	PUERTO_PLATA	19.8N 70.7W	1433Z 20 MAR
MONTSERRAT	PLYMOUTH	16.7N 62.2W	1404Z 20 MAR
SAINT LUCIA	CASTRIES	14.0N 61.0W	1404Z 20 MAR
GUADELOUPE	BASSE-TERRE	16.0N 61.7W	1405Z 20 MAR
HAITI	JEREMIE	18.6N 74.1W	1409Z 20 MAR
	CAP-HAITEN	19.8N 72.2W	1441Z 20 MAR
	PORT-AU-PRINCE	18.5N 72.4W	1507Z 20 MAR
GRENADA	SAINT_GEORGES	12.0N 61.8W	1410Z 20 MAR
DOMINICA	ROSEAU	15.3N 61.4W	1410Z 20 MAR
SAINT KITTS	BASSETERRE	17.3N 62.7W	1413Z 20 MAR
CUBA	SANTIAGO_D_CUBA	19.9N 75.8W	1413Z 20 MAR
	BARACOA	20.4N 74.5W	1429Z 20 MAR
	GIBARA	21.1N 76.1W	1457Z 20 MAR
	CIENFUEGOS	22.0N 80.5W	1504Z 20 MAR
	LA_HABANA	23.2N 82.4W	1614Z 20 MAR
	SANTA_CRZ_D_SUR	20.7N 78.0W	1731Z 20 MAR
	NUEVA_GERONA	21.9N 82.8W	1834Z 20 MAR
SAINT MAARTEN	SIMPSON_BAAI	18.0N 63.1W	1413Z 20 MAR
MARTINIQUE	FORT-DE-FRANCE	14.6N 61.1W	1414Z 20 MAR
ST VINCENT	KINGSTOWN	13.1N 61.2W	1416Z 20 MAR
JAMAICA	KINGSTON	17.9N 76.9W	1419Z 20 MAR
	MONTEGO_BAY	18.5N 77.9W	1428Z 20 MAR
ANGUILLA	THE_VALLEY	18.3N 63.1W	1419Z 20 MAR
PANAMA	PUERTO_CARRETO	8.8N 77.6W	1424Z 20 MAR
	ALIGANDI	9.2N 78.0W	1426Z 20 MAR
	PUERTO_OBALDIA	8.7N 77.4W	1427Z 20 MAR
	COLON	9.4N 79.9W	1435Z 20 MAR
	BOCAS_DEL_TORO	9.4N 82.2W	1501Z 20 MAR
ANTIGUA	SAINT_JOHNS	17.1N 61.9W	1431Z 20 MAR
BARBADOS	BRIDGETOWN	13.1N 59.6W	1431Z 20 MAR
BARBUDA	PALMETTO_POINT	17.6N 61.9W	1432Z 20 MAR
BAHAMAS	GREAT_INAGUA	20.9N 73.7W	1434Z 20 MAR
	MAYAGUANA	22.3N 73.0W	1447Z 20 MAR
	LONG_IS	23.3N 75.1W	1505Z 20 MAR
	CROOKED_IS	22.7N 74.1W	1509Z 20 MAR
	SAN_SALVADOR	24.1N 74.5W	1513Z 20 MAR

	ELEUTHERA_IS	25.2N	76.1W	1524Z 20 MAR
	EXUMA	23.6N	75.9W	1525Z 20 MAR
	CAT_IS	24.4N	75.5W	1525Z 20 MAR
	NASSAU	25.1N	77.4W	1537Z 20 MAR
	ANDROS_IS	25.0N	77.9W	1540Z 20 MAR
	FREEPORT	26.5N	78.8W	1558Z 20 MAR
	ABACO_IS	26.6N	77.1W	1612Z 20 MAR
	BIMINI	25.8N	79.3W	1618Z 20 MAR
TURKS N CAICOS	GRAND_TURK	21.5N	71.1W	1439Z 20 MAR
	WEST_CAICOS	21.7N	72.5W	1443Z 20 MAR
CAYMAN BRAC	CAYMAN_ISLANDS	19.7N	79.9W	1440Z 20 MAR
TRINIDAD TOBAGO	PIRATES_BAY	11.3N	60.6W	1445Z 20 MAR
	PORT-OF-SPAIN	10.6N	61.5W	1620Z 20 MAR
COSTA RICA	PUERTO_LIMON	10.0N	83.0W	1453Z 20 MAR
GRAND CAYMAN	CAYMAN_ISLANDS	19.3N	81.3W	1457Z 20 MAR
SAINT MARTIN	BAIE_BLANCHE	18.1N	63.0W	1459Z 20 MAR
NICARAGUA	PUNTA_GORDA	11.4N	83.8W	1541Z 20 MAR
	PUERTO_CABEZAS	14.0N	83.4W	1937Z 20 MAR
BERMUDA	RUTHS_BAY	32.4N	64.6W	1551Z 20 MAR
MEXICO	COZUMEL	20.5N	87.0W	1555Z 20 MAR
	VERACRUZ	19.2N	96.1W	1839Z 20 MAR
	MADERO	22.3N	97.8W	1845Z 20 MAR
	TEXAS_BORDER	26.0N	97.1W	1856Z 20 MAR
	CAMPECHE	19.9N	90.5W	2221Z 20 MAR
HONDURAS	PUERTO_CORTES	15.9N	88.0W	1555Z 20 MAR
	TRUJILLO	15.9N	86.0W	1626Z 20 MAR
BELIZE	BELIZE_CITY	17.5N	88.2W	1635Z 20 MAR
GUATEMALA	PUERTO_BARRIOS	15.7N	88.6W	1819Z 20 MAR
FRENCH GUIANA	CAYENNE	4.9N	52.3W	1843Z 20 MAR
SURINAME	PARAMARIBO	5.9N	55.2W	1850Z 20 MAR
GUYANA	GEORGETOWN	6.8N	58.2W	1851Z 20 MAR
BRAZIL	FORTALEZA	3.7S	38.5W	1934Z 20 MAR
	SAO_LUIS	2.5S	44.3W	2121Z 20 MAR
	ILHA_DE_MARACA	2.2N	50.5W	2200Z 20 MAR

ADDITIONAL BULLETINS WILL BE ISSUED BY THE PACIFIC TSUNAMI
WARNING CENTER FOR THIS EVENT AS MORE INFORMATION
BECOMES AVAILABLE.

PTWC Message #8

WECA41 PHEB 201910
TSUCAX

TSUNAMI MESSAGE NUMBER 8
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1910 UTC WED MAR 20 2013

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

... THE TSUNAMI WATCH IS CANCELLED ...

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

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1300Z 20 MAR 2013
COORDINATES - 13.4 NORTH 69.9 WEST

LOCATION - CARIBBEAN SEA
MAGNITUDE - 8.5

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DESIRADE GUADALOUPE	16.3N	61.1W	1457Z	0.18M / 0.6FT	24MIN
CULEBRA IS PR	18.3N	65.3W	1459Z	1.38M / 4.5FT	20MIN
CAP HAITIEN HT	19.8N	72.2W	1511Z	0.14M / 0.5FT	23MIN
FAJARDO PR	18.3N	65.6W	1518Z	1.21M / 3.9FT	22MIN
LIMON CR	10.0N	83.0W	1530Z	0.74M / 2.4FT	26MIN

LAT - LATITUDE (N-NORTH, S-SOUTH)
LON - LONGITUDE (E-EAST, W-WEST)
TIME - TIME OF THE MEASUREMENT (Z IS UTC IS GREENWICH TIME)
AMPL - TSUNAMI AMPLITUDE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).
PER - PERIOD OF TIME IN MINUTES(MIN) FROM ONE WAVE TO THE NEXT.

NOTE - DART MEASUREMENTS ARE FROM THE DEEP OCEAN AND THEY
ARE GENERALLY MUCH SMALLER THAN WOULD BE COASTAL
MEASUREMENTS AT SIMILAR LOCATIONS.

EVALUATION

A SIGNIFICANT TSUNAMI WAS GENERATED BY THIS EARTHQUAKE.
SEA LEVEL READINGS NOW INDICATE THAT THE THREAT IS DIMINISHING
IN MOST AREAS. THEREFORE THE TSUNAMI WATCH ISSUED BY THIS CENTER
IS NOW CANCELLED.

FOR ANY AFFECTED AREAS - WHEN NO MAJOR WAVES HAVE OCCURRED FOR AT
LEAST TWO HOURS AFTER THE ESTIMATED ARRIVAL TIME OR DAMAGING WAVES
HAVE NOT OCCURRED FOR AT LEAST TWO HOURS THEN LOCAL AUTHORITIES
CAN ASSUME THE THREAT IS PASSED. DANGER TO BOATS AND COASTAL
STRUCTURES CAN CONTINUE FOR SEVERAL HOURS DUE TO RAPID CURRENTS.
AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI WAVE
ACTION THE ALL CLEAR DETERMINATION MUST BE MADE BY LOCAL
AUTHORITIES.

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

Appendix G. West Coast and Alaska Tsunami Warning Center Web-based Products

Graphical and web-based products are posted to the TWC web sites during an event. This Appendix contains several examples of what would be posted by the West Coast Alaska Tsunami Warning Center whose Area of Responsibility currently includes, Puerto Rico, Virgin Islands, US Gulf and East Coast and Canada East Coast.

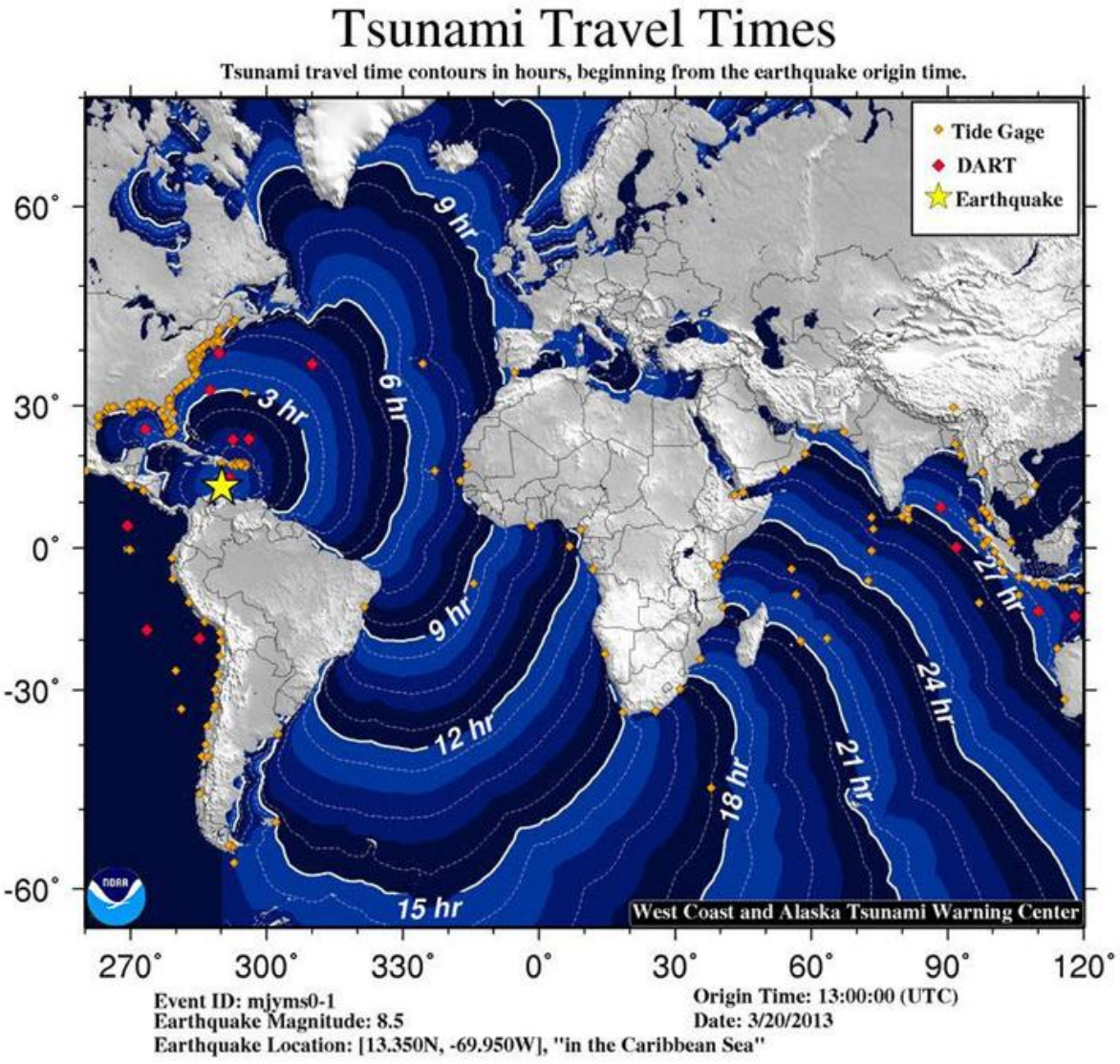

Figure E1: Example of a travel time map that would be issued with event.

Tsunami travel time list example below.

```
The following list gives estimated times of arrival for
locations along the Puerto Rico, Virgin Islands, U.S. Gulf and U.S. and Canadian
Atlantic coast and a few additional points from a tsunami generated at the given
source location.

THE LISTING OF A TSUNAMI ARRIVAL TIME BELOW DOES NOT
INDICATE A WAVE IS IMMINENT.  REFER TO THE WARNING
BULLETIN TO DETERMINE WHICH AREAS ARE THREATENED.
```

The listed arrival time is the initial wave arrival.
Tsunamis can be dangerous for many hours after arrival,
and the initial wave is not necessarily the largest.
The list is ordered by arrival time starting with the earliest.

Source:
Lat: 13.4N
Lng: 70.0W
Mag: 8.5
O-time: 1300UTC
Date: MAR 20

Estimated times of initial tsunami arrival:

Mona Island, Puerto Rico	0946 AST MAR 20	1346 UTC MAR 20
Esperanza, Vieques Is., Puerto Rico	0952 AST MAR 20	1352 UTC MAR 20
Limetree Bay, U.S. Virgin Is.	0953 AST MAR 20	1353 UTC MAR 20
Magueyes Island, Puerto Rico	0954 AST MAR 20	1354 UTC MAR 20
Christiansted, U.S. Virgin Is	0955 AST MAR 20	1355 UTC MAR 20
Aguadilla, Puerto Rico	0957 AST MAR 20	1357 UTC MAR 20
Mayaguez, Puerto Rico	1001 AST MAR 20	1401 UTC MAR 20
Lameshur Bay, U.S. Virgin Islands	1006 AST MAR 20	1406 UTC MAR 20
Tortola, British Virgin Islands	1007 AST MAR 20	1407 UTC MAR 20
Culebra, Puerto Rico	1014 AST MAR 20	1414 UTC MAR 20
San Juan, Puerto Rico	1015 AST MAR 20	1415 UTC MAR 20
Virgin Gorda, British Virgin Islands	1024 AST MAR 20	1424 UTC MAR 20
Guantanamo Bay, Cuba	1027 EDT MAR 20	1427 UTC MAR 20
DART 41420	1032 EDT MAR 20	1432 UTC MAR 20
DART 41421	1038 EDT MAR 20	1438 UTC MAR 20
Charlotte Amalie, U.S. Virgin Is	1041 AST MAR 20	1441 UTC MAR 20
Samana Cay, Bahamas	1104 EDT MAR 20	1504 UTC MAR 20
DART 41424	1153 EDT MAR 20	1553 UTC MAR 20
Bermuda	1156 EDT MAR 20	1556 UTC MAR 20
Cancun, Mexico	1111 CDT MAR 20	1611 UTC MAR 20
Settlement Point, Bahamas	1214 EDT MAR 20	1614 UTC MAR 20
Virginia Key, Florida	1243 EDT MAR 20	1643 UTC MAR 20
Jupiter Inlet, Florida	1245 EDT MAR 20	1645 UTC MAR 20
DART 44402	1250 EDT MAR 20	1650 UTC MAR 20
Ocean Reef, Florida	1255 EDT MAR 20	1655 UTC MAR 20
Key West, Florida	1257 EDT MAR 20	1657 UTC MAR 20
Miami, Florida	1258 EDT MAR 20	1658 UTC MAR 20
Cape Hatteras, North Carolina	1259 EDT MAR 20	1659 UTC MAR 20
DART 42409	1300 EDT MAR 20	1700 UTC MAR 20
DART 44401	1303 EDT MAR 20	1703 UTC MAR 20
Oregon Inlet, North Carolina	1323 EDT MAR 20	1723 UTC MAR 20
Vaca Key, Florida	1329 EDT MAR 20	1729 UTC MAR 20
Pilots Station East, Louisiana	1231 CDT MAR 20	1731 UTC MAR 20
Beaufort, North Carolina	1345 EDT MAR 20	1745 UTC MAR 20
Duck, North Carolina	1354 EDT MAR 20	1754 UTC MAR 20
Port Canaveral, Florida	1354 EDT MAR 20	1754 UTC MAR 20
Currituck Beach Lighthouse, North Carolina	1359 EDT MAR 20	1759 UTC MAR 20
Ocean City, Maryland	1413 EDT MAR 20	1813 UTC MAR 20
Melbourne, Florida	1413 EDT MAR 20	1813 UTC MAR 20
Surf City, North Carolina	1420 EDT MAR 20	1820 UTC MAR 20
Wrightsville Beach, North Carolina	1420 EDT MAR 20	1820 UTC MAR 20
Grand Isle, Louisiana	1325 CDT MAR 20	1825 UTC MAR 20
South Santee River, South Carolina	1426 EDT MAR 20	1826 UTC MAR 20
Lockeport, Nova Scotia	1527 ADT MAR 20	1827 UTC MAR 20
Montauk Point, New York	1431 EDT MAR 20	1831 UTC MAR 20
Destin, Florida	1334 CDT MAR 20	1834 UTC MAR 20
Virginia Beach, Virginia	1434 EDT MAR 20	1834 UTC MAR 20
Flagler Beach, Florida	1438 EDT MAR 20	1838 UTC MAR 20
Atlantic City, New Jersey	1440 EDT MAR 20	1840 UTC MAR 20
Cape Henlopen, Delaware	1440 EDT MAR 20	1840 UTC MAR 20
Fire Island Light, New York	1442 EDT MAR 20	1842 UTC MAR 20
Lewes, Delaware	1443 EDT MAR 20	1843 UTC MAR 20

Port Fourchon, Louisiana	1343 CDT MAR 20	1843 UTC MAR 20
Watch Hill, Rhode Island	1444 EDT MAR 20	1844 UTC MAR 20
Jacksonville Beach, Florida	1447 EDT MAR 20	1847 UTC MAR 20
Alvarado, Mexico	1347 CDT MAR 20	1847 UTC MAR 20
Panama City, Florida	1348 CDT MAR 20	1848 UTC MAR 20
Chesapeake Bridge, Virginia	1453 EDT MAR 20	1853 UTC MAR 20
Myrtle Beach, South Carolina	1453 EDT MAR 20	1853 UTC MAR 20
Springmaid Pier, South Carolina	1455 EDT MAR 20	1855 UTC MAR 20
Newport, Rhode Island	1456 EDT MAR 20	1856 UTC MAR 20
Woods Hole, Massachusetts	1457 EDT MAR 20	1857 UTC MAR 20
Tampico, Mexico	1401 CDT MAR 20	1901 UTC MAR 20
Charleston, South Carolina	1502 EDT MAR 20	1902 UTC MAR 20
Brownsville, Texas	1403 CDT MAR 20	1903 UTC MAR 20
Sandy Hook, New Jersey	1503 EDT MAR 20	1903 UTC MAR 20
Flamingo, Florida	1504 EDT MAR 20	1904 UTC MAR 20
Savannah, Georgia	1506 EDT MAR 20	1906 UTC MAR 20
New London, Connecticut	1506 EDT MAR 20	1906 UTC MAR 20
Fernandina Beach, Florida	1506 EDT MAR 20	1906 UTC MAR 20
Charlesville, Nova Scotia	1608 ADT MAR 20	1908 UTC MAR 20
Nantucket Island, Massachusetts	1508 EDT MAR 20	1908 UTC MAR 20
Cape May, New Jersey	1510 EDT MAR 20	1910 UTC MAR 20
Apalachicola, Florida	1412 CDT MAR 20	1912 UTC MAR 20
Yarmouth, Nova Scotia	1613 ADT MAR 20	1913 UTC MAR 20
Chezzetcook, Nova Scotia	1614 ADT MAR 20	1914 UTC MAR 20
Kiptopeke, Virginia	1515 EDT MAR 20	1915 UTC MAR 20
Halifax, Nova Scotia	1616 ADT MAR 20	1916 UTC MAR 20
Port Isabel, Texas	1417 CDT MAR 20	1917 UTC MAR 20
Port Aux Basque, Newfoundland	1650 NDT MAR 20	1920 UTC MAR 20
Money Point, Virginia	1522 EDT MAR 20	1922 UTC MAR 20
Altamaha Sound, Georgia	1525 EDT MAR 20	1925 UTC MAR 20
Corpus Christi, Texas	1425 CDT MAR 20	1925 UTC MAR 20
Cutler NAS, Maine	1525 EDT MAR 20	1925 UTC MAR 20
Cape Ray, Newfoundland	1655 NDT MAR 20	1925 UTC MAR 20
Scatarie Island, Nova Scotia	1625 ADT MAR 20	1925 UTC MAR 20
Quonset Point, Rhode Island	1527 EDT MAR 20	1927 UTC MAR 20
St Lawrence, Newfoundland	1657 NDT MAR 20	1927 UTC MAR 20
the Mississippi-Alabama border	1427 CDT MAR 20	1927 UTC MAR 20
St. Simons Is., Georgia	1532 EDT MAR 20	1932 UTC MAR 20
Windmill Point, Virginia	1533 EDT MAR 20	1933 UTC MAR 20
Saint Pierre/Miquelon	1703 NDT MAR 20	1933 UTC MAR 20
Baffin Bay, Texas	1436 CDT MAR 20	1936 UTC MAR 20
Clearwater Beach, Florida	1537 EDT MAR 20	1937 UTC MAR 20
Meat Cove, Nova Scotia	1638 ADT MAR 20	1938 UTC MAR 20
Bar Harbor, Maine	1540 EDT MAR 20	1940 UTC MAR 20
Grand Manan Is., New Brunswick	1640 ADT MAR 20	1940 UTC MAR 20
the U.S.-Canada border	1543 EDT MAR 20	1943 UTC MAR 20
New Point Comfort, Virginia	1543 EDT MAR 20	1943 UTC MAR 20
Argentia, Newfoundland	1716 NDT MAR 20	1946 UTC MAR 20
Fort Point, New Hampshire	1552 EDT MAR 20	1952 UTC MAR 20
North Sydney, Nova Scotia	1654 ADT MAR 20	1954 UTC MAR 20
Merrimack River, Massachusetts	1556 EDT MAR 20	1956 UTC MAR 20
Manhattan, New York	1557 EDT MAR 20	1957 UTC MAR 20
Stonington, Maine	1558 EDT MAR 20	1958 UTC MAR 20
Ship John Shoal, New Jersey	1600 EDT MAR 20	2000 UTC MAR 20
La Manche, Newfoundland	1731 NDT MAR 20	2001 UTC MAR 20
Port O'connor, Texas	1501 CDT MAR 20	2001 UTC MAR 20
Bergen Point, New Jersey	1602 EDT MAR 20	2002 UTC MAR 20
Rock Port, Texas	1503 CDT MAR 20	2003 UTC MAR 20
Saint John, New Brunswick	1704 ADT MAR 20	2004 UTC MAR 20
Waveland, Mississippi	1504 CDT MAR 20	2004 UTC MAR 20
New Haven, Connecticut	1604 EDT MAR 20	2004 UTC MAR 20
Freeport, Texas	1505 CDT MAR 20	2005 UTC MAR 20
Portland, Maine	1614 EDT MAR 20	2014 UTC MAR 20
Yorktown, Virginia	1618 EDT MAR 20	2018 UTC MAR 20
Saint Johns, Newfoundland	1750 NDT MAR 20	2020 UTC MAR 20
Bridgeport, Connecticut	1627 EDT MAR 20	2027 UTC MAR 20
Lewisetta, Virginia	1628 EDT MAR 20	2028 UTC MAR 20

Naples, Florida	1628 EDT MAR 20	2028 UTC MAR 20
Boston, Massachusetts	1630 EDT MAR 20	2030 UTC MAR 20
Champoton, Mexico	1535 CDT MAR 20	2035 UTC MAR 20
Port Manatee, Florida	1637 EDT MAR 20	2037 UTC MAR 20
Galveston, Texas	1540 CDT MAR 20	2040 UTC MAR 20
Bonita Beach, Florida	1640 EDT MAR 20	2040 UTC MAR 20
Fort Myers, Florida	1643 EDT MAR 20	2043 UTC MAR 20
St. Petersburg, Florida	1643 EDT MAR 20	2043 UTC MAR 20
Biloxi, Mississippi	1545 CDT MAR 20	2045 UTC MAR 20
Providence, Rhode Island	1646 EDT MAR 20	2046 UTC MAR 20
Suwannee River, Florida	1648 EDT MAR 20	2048 UTC MAR 20
Eugene Is., Louisiana	1548 CDT MAR 20	2048 UTC MAR 20
Morgan City, Louisiana	1600 CDT MAR 20	2100 UTC MAR 20
Bonavista, Newfoundland	1837 NDT MAR 20	2107 UTC MAR 20
Harrington Harbour, Quebec	1813 ADT MAR 20	2113 UTC MAR 20
Pointe Saint Pierre, Quebec	1819 ADT MAR 20	2119 UTC MAR 20
Kings Point, New York	1722 EDT MAR 20	2122 UTC MAR 20
Cedar Key, Florida	1725 EDT MAR 20	2125 UTC MAR 20
Sabine Pass, Texas	1625 CDT MAR 20	2125 UTC MAR 20
High Island, Texas	1626 CDT MAR 20	2126 UTC MAR 20
Battle Harbour, Labrador	1900 NDT MAR 20	2130 UTC MAR 20
Holton Harbour, Newfoundland	1917 NDT MAR 20	2147 UTC MAR 20
Boat Harbour, Newfoundland	1935 NDT MAR 20	2205 UTC MAR 20
Wood Islands, Prince Edward Is.	1916 ADT MAR 20	2216 UTC MAR 20
Lanse au Clair, Newfoundland	1946 NDT MAR 20	2216 UTC MAR 20
Sept Iles, Quebec	1917 ADT MAR 20	2217 UTC MAR 20
Cape Chidley, Labrador	1827 AST MAR 20	2227 UTC MAR 20
Nuuk, Greenland	1835 EDT MAR 20	2235 UTC MAR 20
Hebron, Newfoundland	1951 ADT MAR 20	2251 UTC MAR 20
Escuminac, New Brunswick	1955 ADT MAR 20	2255 UTC MAR 20
Charlottetown, Prince Edward Is.	1959 ADT MAR 20	2259 UTC MAR 20
Belledune, New Brunswick	2004 ADT MAR 20	2304 UTC MAR 20
Nain, Newfoundland	2004 ADT MAR 20	2304 UTC MAR 20
Brevoort Harbour, Nunavut	1905 EDT MAR 20	2305 UTC MAR 20
Cape Dyer, Nunavut	1915 EDT MAR 20	2315 UTC MAR 20
Shediac, New Brunswick	2112 ADT MAR 20	0012 UTC MAR 21
Clyde River, Nunavut	2039 EDT MAR 20	0039 UTC MAR 21
Thule AFB, Greenland	2146 EDT MAR 20	0146 UTC MAR 21
Dundas Harbor, Nunavut	2154 EDT MAR 20	0154 UTC MAR 21

Appendix H. Sample Press Release for Local Media

TEMPLATE FOR NEWS RELEASE

USE AGENCY MASTHEAD

Contact: (insert name)
(insert phone number)
(insert email address)

FOR IMMEDIATE RELEASE
(insert date)

CARRIBEAN TSUNAMI EXERCISE TO BE CONDUCTED March 20, 2013

(*insert community/county/state name*) will join other localities in the Caribbean as a participant in a tsunami response exercise on March 20, 2013. The purpose of this exercise is to evaluate local tsunami response plans, increase tsunami preparedness, and improve coordination throughout the region.

(*insert a promotional comment from a local official, such as "The 2011 Japan and the 2010 Haiti and Chile earthquakes and tsunamis have reminded the world again of the urgent need to be more prepared for such events," said (insert name of appropriate official*). "This important exercise will test the current procedures of the Tsunami Warning System and help identify operational strengths and weaknesses in each community." (*Please modify for uniqueness.))*

The exercise, titled CARIBE WAVE 13/LANTEX 13, will simulate a widespread Tsunami Warning and Watch situation throughout the Caribbean which requires implementation of local tsunami response plans. It is the second such international exercise in the Caribbean region. The exercise will (*insert "include" or "not include")* public notification.

The exercise will simulate a major earthquake and tsunami generated 57 miles north of Oranjestad, Aruba in the Caribbean Sea at 9:00am Atlantic Standard Time (*or appropriate local time*) on March 20, 2013. Exercise participants will be provided with a handbook which describes the scenario and contains tsunami messages from the West Coast/Alaska Tsunami Warning Center (WCATWC) and the Pacific Tsunami Warning Center (PTWC). The WCATWC is currently responsible for providing tsunami information to the Atlantic coasts of U.S. and Canada, the Gulf of Mexico coast, Puerto Rico, and the Virgin Islands while the PTWC is the interim Regional Tsunami Watch Provider for the other countries in the Caribbean Sea and Adjacent Regions.

Insert paragraph tailored for specific community. Could identify participating agencies and specific plans. Could describe current early warning program, past tsunami exercises (if any), ongoing mitigation and public education programs, etc. Could describe tsunami threat, history of tsunami hazards, if any.

If any real tsunami threat occurs during the time period of the exercise, the exercise will be terminated.

The exercise is sponsored by the UNESCO/IOC Intergovernmental Coordination Group for Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS), the Caribbean Emergency Management Agency (CDEMA), the Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (CEPREDENAC), the U.S. National Oceanic and Atmospheric Administration (NOAA) and by the U.S. National Tsunami Hazard Mitigation Program (NTHMP – a partnership of 29 states and territories and three federal agencies). For more information on the U.S. tsunami warning system, see www.tsunami.gov. For more information on the NTHMP, see nthmp.tsunami.gov. For more information on the ICG/CARIBE-EWS, see http://www.ioc-tsunami.org/content/view/36/1036/.

###

On the Web:

ICG/CARIBE EWS	http://www.ioc-tsunami.org
West Coast/Alaska Tsunami Warning Center	http://wcatwc.arh.noaa.gov
Pacific Tsunami Warning Center	http://ptwc.weather.gov
NOAA Tsunami Program	http://www.tsunami.gov
NTHMP:	http://nthmp.tsunami.gov
Caribbean Tsunami Warning Program	http://www.srh.noaa.gov/srh/ctwp
Insert state/local emergency response URLs	

APPENDIX I. POST-EXERCISE EVALUATION

UNESCO
INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION

EXERCISE CARIBEWAVE/LANTEX 13

POST-EXERCISE EVALUATION

Each country/state/territory will submitt one exercise evaluation form. The answers provided are to be based on reports received from participating agencies. It is up to each country to decide if the Tsunami Warning Focal Point or the Tsunami National Contact submitts the form. The online survey should be **completed no later than April 1, 2013** (within 11 days of exercise).

Note: **Only one on-line evaluation form is to be completed per county or jurisdiciton with offically designated tsunami warning focal (dissemination) point.**

The CARIBE WAVE/LANTEX 13 Evaluation Form can be completed online at https://www.surveymonkey.com/s/caribewave13_eval

The online survey also provides the oportunity for individuals and organizations to submitt their feedback.

- For any questions please contact Exercise Chair, Christa von Hillebrandt-Andrade (email: SR.CTWP@noaa.gov)

Exercise CARIBE WAVE/LANTEX 13 Instructions on how to complete this Evaluation Form		
Step	**Who completes this step?**	**Description**
1	Each participating Country/State/Territory	Print this form and mark your evaluation answers on it.

2	Each participating Country/State/Territory	• Answer each statement with either Y (Yes), N (No), or Not Applicable (N/A) by ticking the relevant box. • Comments should be used to explain/expand your Yes, No, or Not Applicable answers. • Tick the C (Comment) box to indicate if you are providing comments. • Write your comments on the page following the evaluation questions. Note the question number in the left column and write your comments alongside. **Example:** ☑ Y ☐ N ☑ C ☐ NA **Ref No.Comment** 1 C.7 The national public safety decision-making and dissemination point received information at 14:35 UTC.
3	Tsunami National Contact or Designated Agency	Tsunami National Contact or Designated Agency should complete and submit the CARIBE WAVE/LANTEX 13 Online Evaluation Form by April1, 2013 (https://www.surveymonkey.com/s/caribewave13_eval). If there are problems or questions, please contact the CARIBE WAVE/LANTEX 13 Task Team Chair, Christa von Hillebrandt (SR.CTWP@noaa.gov)

Exercise CARIBE WAVE/LANTEX 13 Evaluation Form Contact Details			
Agency:		**Country/State/Territory:**	
Contact Name:		**Contact Position:**	
Contact Phone:		**Contact Mobile:**	
Contact E-Mail:			

		Yes		No		Comment		Not applicable	
0A	Are you filling out this evaluation as the Tsunami National Contact or Designated Agency? **If No, only answer Section 5.**		*Y*		*N*		*C*		*NA*

		Yes		No		Comment		Not applicable	
0B	Did your country participate in CARIBE WAVE/LANTEX 13? If not, only answer sections 2 and 3 A and B.		*Y*		*N*		*C*		*NA*

OBJECTIVE 1 **To exercise and evaluate operations of the current Tsunami Warning System and in particular, the CARIBE EWS**
SUB OBJECTIVE 1A Validate the **issuance** of tsunami advice from the PTWC and WCATWC.

Ref No	Evaluation Statements/Questions	Yes		No		Comment		Not applicable	
1A.1	The information issued by the relevant Tsunami Warning Centres was according to standard operating procedures.		*Y*		*N*		*C*		*NA*
1A.2	The time the PTWC and/or WCATWC sent the Exercise CARIBE WAVE/LANTEX 13 initial dummy message was that in the exercise manual?		*Y*		*N*		*C*		*NA*

1A.3	The PTWC and/or WCATWC Exercise CARIBE WAVE/LANTEX 13 **initial dummy message** was sent to national tsunami warning centres by the following methods. **Please check all methods thru which the messages were received.** ○ GTS ○ AWIPS ○ NWWS ○ AFTN ○ EMWIN ○ Fax ○ Email ○ RANET Heads-up SMS ○ Other (Please specify):		*Y*		*N*		*C*		*NA*
1A.4	Did you receive any message from an organization other than the WCATWC and/or PTWC? Please list agencies that issued products during the exercise.		*Y*		*N*		*C*		*N/A*

OBJECTIVE 1
To exercise and evaluate operations of the current Tsunami Warning System and in particular, the CARIBE EWS
SUB OBJECTIVE 1B
Validate the **receipt and issuance** of tsunami advice by CARIBE EWS Tsunami Warning Focal Points (TWFP).

Ref No	**Evaluation Statements/Questions**	Yes		No		Comment		Not applicable	
1B.1	The PTWC and/or WCATWC CARIBE WAVE/LANTEX 13 scenario **initial dummy message** was received by your country TWFP.		*Y*		*N*		*C*		*NA*
1B.2	What time was the PTWC and/or WCATWC CARIBE WAVE/LANTEX 13 **initial dummy message** received by your TWFP? Please indicate the time from each international TWC. Please note time using 24 hour clock and UTC, e.g., 14:35 UTC. – PTWC – WCATWC		*Y*		*N*		*C*		*NA*

Ref No	Evaluation Statements/Questions	Yes	No	Comment	Not applicable
1B.3	How did the TWFP receive the message(s)? Please indicate for each international TWC if they are different. Do you receive of any of all methods that are in the list? ○ GTS ○ AFTN ○ EMWIN ○ Fax ○ Email ○ CISN (Real-Time Earthquake Display) ○ RANET Heads-up SMS ○ Other (Please specify):				
1B.4	If the national public-safety, decision-making and **dissemination point** is different to the country/national TWFP, did you receive the information of the national public-safety, decision-making and **dissemination point?**				
1B.5	How did the national public safety decision-making and dissemination point receive the international message(s)? ○ GTS ○ AFTN ○ EMWIN ○ Fax ○ Email ○ CISN (Real-Time Earthquake Display) ○ RANET Heads-up SMS ○ Other (Please specify):				
1B.6	Were there any problems with the receipt of PTWC and/or WCATWC Exercise CARIBE WAVE/ LANTEX 13 **initial dummy message** (s)?				

Y *N* *C* *NA*

Ref No	Evaluation Statements/Questions	Yes	No	Comment	Not applicable
1B.7	Did your TWFP/TNC register to receive via email the tsunami messages from the PTWC/WCATWC				
1B.8	Did your TWFP/TNC receive the email messages at the times specified in the Exercise Manual				
1B.9	The information issued by your country national Tsunami Warning Focal Point was according to standard operating procedures.				
1B.10	The information issued by our Tsunami Warning Focal Point was timely.				
1B.11	The information issued by our national public-safety, decision-making and dissemination point was timely.				
1B.12	Is the national public-safety, decision-making and dissemination point different to the national tsunami warning focal point?				
1B.13	Information provided in the relevant international warning centre messages was understood by the Tsunami Warning Focal Point.				
1B.14	The information provided in the relevant international warning centre messages assisted with decision making, e.g., warning levels, earthquake parameters, estimated arrival times, forecast wave heights, etc.				
1B.15	The information provided was fully utilised by the TWFP.				
1B.16	Existing in-country hazard information/local data was utilised.				
1B.17	Additional in-country local/regional expert advice was utilised.				

OBJECTIVE 2 **To begin a process of exposure to an initial test version of PTWC experimental products.**
SUB OBJECTIVE 2A Review and evaluate PTWC experimental products that will be posted one month before the exercise at http://www.caribewave.info with existing PTWC products for the exercise scenario.

Ref No	Evaluation Statements / Questions	Yes	No	Comment	Not applicable
2A.1	The information contained in the experimental products is understandable.	*Y*	*N*	*C*	*NA*
2A.2	The information contained in the experimental products helps with your decision-making.	*Y*	*N*	*C*	*NA*

OBJECTIVE 2 **To begin a process of exposure to an initial test version of PTWC experimental products.**
SUB OBJECTIVE 2B Provide feedback on the staging, format and content of the experimental products

Ref No	Evaluation Statements / Questions	Yes	No	Comment	Not applicable
2B.1	Staging: Should forecast threat levels be included in the initial first product, knowing that forecasts are likely to change over the first hour as later-arriving seismic data and sea level data are received and analysed?	*Y*	*N*	*C*	*NA*
2B.2	Staging: Should forecast threat levels be given only for coasts within 6 hours of the estimated tsunami arrival time in initial products, knowing that initial forecasts will be based only upon the seismic parameters?	*Y*	*N*	*C*	*NA*
2B.3	Format: Does the primary text product contain the right information?	*Y*	*N*	*C*	*NA*
2B.4	Format: Does the proposed suite of products– primary text product, energy map, threat map, table of threat levels, table of arrival times– provide all the necessary information? Please	*Y*	*N*	*C*	*NA*

Ref No	Evaluation Statements / Questions	Yes	No	Comment	Not applicable
	note on comment page.				
2B.5	Content: Are there other information or products that should be included in the suite of products? Consider earthquake and tsunami information, and/or threat assessment products. Please note on comment page.	*Y*	*N*	*C*	*NA*
2B.6	Content: Are the proposed forecast zones appropriate? If not, please suggest better zonations.	*Y*	*N*	*C*	*NA*
2B.7	Content: Are the proposed forecast levels: 0–0.3m, >0.3–1m, >1–3m, 3-10m and >10m adequate?	*Y*	*N*	*C*	*NA*

OBJECTIVE 3

To validate the readiness of Member States to respond to a local/regional source tsunami.

SUB OBJECTIVE 3A

Validate the operational readiness of the Tsunami Warning Focal Point (TWFP, or like function) and/or the National Disaster Management Office (NDMO).

Ref No	Evaluation Statements/Questions	Yes	No	Comment	Not applicable
3A.1	The TWFP/NDMO has an activation and response process (standard operating procedures) in place for the receipt of tsunami warnings.	*Y*	*N*	*C*	*NA*
3A.2	The TWFP/NDMO knows its specific response role in the event of a tsunami.	*Y*	*N*	*C*	*NA*
3A.3	The TWFP/NDMO has, prior to the exercise, engaged in tsunami response planning.	*Y*	*N*	*C*	*NA*
3A.4	The TWFP/NDMO has undertaken activity to increase its capacity and capability to support a national tsunami response (for example, training, exercise, etc)–Note activities in Comment section.	*Y*	*N*	*C*	*NA*
3A.5	The TWFP/NDMO has an appropriate management structure identified and documented to support tsunami response.	*Y*	*N*	*C*	*NA*
3A.6	The TWFP/NDMO has a tsunami mass coastal evacuation plan.	*Y*	*N*	*C*	*NA*

OBJECTIVE 3

To validate the readiness of Member States to respond to a local/regional source tsunami.

SUB OBJECTIVE 3B

To improve operational readiness. Before the exercise, ensure appropriate tools and response plan(s) have been developed, including public education materials)

Ref No	Evaluation Statements / Questions	Yes	No	Comment	Not applicable
3B.1	Arrangements to assemble the in-country disaster management group relevant to decision-making on tsunami warning and response exist.	*Y*	*N*	*C*	*NA*
3B.2	A country tsunami emergency response plan (standard operating procedures) for tele/regional/local tsunamis exists.	*Y*	*N*	*C*	*NA*
3B. 3	The response plan includes processes to issue all-clear (safe to return) notices	*Y*	*N*	*C*	*N/A*
3B.4	Public education materials have been developed and disseminated.	*Y*	*N*	*C*	*NA*
3B.5	Regional/local tsunami exercises are routinely conducted in-country. Note last exercise in Comments section.	*Y*	*N*	*C*	*NA*
3B.6	Tsunami-related curriculum programmes are in place for all levels of education. Note which levels in Comments section.	*Y*	*N*	*C*	*NA*
3B.7	Communities have tsunami evacuation maps, routes, evacuation signs and assembly points for evacuation areas?	*Y*	*N*	*C*	*NA*

OBJECTIVE 3

To validate the readiness of Member States to respond to a local/regional source tsunami.

SUB OBJECTIVE 3C

Validate dissemination of warnings and information/advice by Tsunami Warning Focal Point to relevant in-country agencies and the public is accurate and timely.

Ref No	Evaluation Statements/Questions	Yes	No	Comment	Not applicable
3C.1	The response activation process was followed when the initial PTWC and/or WCATWC Exercise CARIBE WAVE/LANTEX 13 scenario exercise start message was received.	*Y*	*N*	*C*	*NA*

3C.2	The warning was disseminated to: • Emergency services • Other national government agencies • Science agencies/universities involved in assessment • Local government: provincial/regional level • Local government: city/district level. • Public		*Y*		*N*		*C*		*NA*
			Y		*N*		*C*		*NA*
			Y		*N*		*C*		*NA*
			Y		*N*		*C*		*NA*
			Y		*N*		*C*		*NA*
			Y		*N*		*C*		*NA*
3C.3	Did the TWFP send the PTWC and/or WCATWC Exercise CARIBE WAVE/LANTEX 13 scenario initial dummy message to the agency or agencies listed in Q3.C2?		*Y*		*N*		*C*		*NA*
3C.4	Was the PTWC and/or WCATWC Exercise CARIBE WAVE/LANTEX 13 scenario initial dummy message sent to the agency or agencies listed in Q3.C2 within 2 minutes?		*Y*		*N*		*C*		*NA*

	Yes	No	Comment	Not applicable

Ref No	Evaluation Statements / Questions								
3C.5	The method of communication <u>from</u> our public-safety, national decision-making and dissemination point to agencies was sufficient (timely, clear, accurate) to support decision-making.		*Y*		*N*		*C*		*NA*
3C.6	The method of communication **between** our public safety national decision making and dissemination point and individual response agencies and provinces/local jurisdictions was sufficient to support national information requirements and decision-making.		*Y*		*N*		*C*		*NA*
3C.7	Did a management group responsible for decision-making on tsunami warning and response assemble during the exercise?		*Y*		*N*		*C*		*NA*
3C.8	If you answered yes to Q 3C.7 (above), was this timely to facilitate good decision-making?		*Y*		*N*		*C*		*NA*

OBJECTIVE 3

To validate the readiness of Member States to respond to a local/regional source tsunami.

SUB OBJECTIVE 3D

Validate the organisational decision-making process about public warnings and evacuations.

Ref No	Evaluation Statements/Questions	Yes	No	Comment	Not applicable
3D.1	Did the national disaster management organisation (or equivalent) maintain communication with the Tsunami Warning Focal Point throughout the event?		*Y*	*N*	*C*	*NA*
3D.2	Did the national disaster management organisation (or equivalent) maintain communication with local/regional disaster management organisations (or equivalent)?					
3D.3	Were any areas evacuated?		*Y*	*N*	*C*	*NA*
3D.4	Were tsunami **inundation** maps available for evacuated areas?		*Y*	*N*	*C*	*NA*
3D.5	Did your tsunami warning focal point use any numerical model tsunami scenarios during the exercise (e.g., Deep-ocean propagation and/or coastal inundation models?)		*Y*	*N*	*C*	*NA*
3D.6	Did your country assess the tsunami threat during the exercise? Check all that apply in this list. ○ National tsunami experts ○ National tsunami coordination committee ○ National tsunami historical database ○ NOAA NGDC/WDC-MGG tsunami historical database (web) ○ TsuDig historical database GIS tool (NGDC/ITIC offline) ○ National pre-computed tsunami scenarios ○ National tsunami forecasts ○ International tsunami forecasts. Note source of forecasts (PTWC, WC/ATWC) in Comments.		*Y*	*N*	*C*	*NA*

Ref No	Evaluation Statements/Questions	Yes	No	Comment	Not applicable
	○ Communication with outside sources (such as Caribbean Tsunami Warning Program, ITIC, media, other).				

OBJECTIVE 3
To validate the readiness of Member States to respond to a local/regional source tsunami.
SUB OBJECTIVE 3E
Validate the methods used to notify and instruct the public are accurate and timely.

Ref No	Evaluation Statements/Questions	Yes	No	Comment	Not applicable
3E.1	Was a tsunami warning and/or information issued to the public?	*Y*	*N*	*C*	*NA*
3E.1	If you answered yes to Q3E.1,was the tsunami warning and/or information issued **in a timely** manner to the public?	*Y*	*N*	*C*	*NA*
3E.3	If you answered yes to Q3E.1, how was the warning/information communicated with the public? Please tick as many as apply: ____Telephone ____ SMS ____Cell/mobile phone broadcast ____Radio ____ TV ____Twitter ____Email (WCATWC/PTWC) ____Facebook ____ RSS ____Websites ____Sirens ____ Public Announcement systems ____Police ____ Public call centre ____Door-to-door announcements ____ NOAA Weather Radio or Like Systems ____Other (please specify):				

Note answer on the following comment page

OBJECTIVE 3 **To validate the readiness of Member States to respond to a tsunami.**
SUB OBJECTIVE 3F Validate the elapsed time until the public would be notified and instructed/advised.

Ref No	Evaluation Statements/Questions	Yes	No	Comment	Not applicable
3F. 1	The public were officially notified prior to the scenario wave arrival time	*Y*	*N*	*C*	*NA*
3F. 2	In addition to the TWFP/NDMO did other government and private sector participate? If yes, please include in comments section.	*Y*	*N*	*C*	*NA*

GENERAL OBSERVATIONS Please complete this section **after** Exercise CARIBE WAVE/LANTEX 13.

Ref No	Evaluation Statements / Questions	Yes	No	Comment	Not applicable
	Overall assessment				
4.1	The Country (TNC/TWFP/NDEMO) has a better understanding of the responsibilities and roles in tsunami emergencies.	*Y*	*N*	*C*	*NA*
4.2	Gaps in capability and capacity have been identified.	*Y*	*N*	*C*	*NA*
4.3	The Country enhanced the relationships among the Tsunami Warning System stakeholders as a result of the exercise.	*Y*	*N*	*C*	*NA*
4.4	News media participated and covered the exercise (please provide electronic links if appropriate)	*Y*	*N*	*C*	*NA*
	Exercise planning (please make comments on the following page to all of the statements below)	*Y*	*N*	*C*	*NA*
4.5	Overall, the exercise planning, conduct, format and style were satisfactory.	*Y*	*N*	*C*	*NA*
4.6	Exercise planning at the **international level** went well.	*Y*	*N*	*C*	*NA*
4.7	Exercise planning at the **national level** went well.	*Y*	*N*	*C*	*NA*
4.8	Exercise planning at the **provincial/local level** went well.	*Y*	*N*	*C*	*NA*
4.9	The CARIBE WAVE/LANTEX 13 exercise websites pages were useful.	*Y*	*N*	*C*	*NA*

Ref No	Evaluation Statements / Questions	Yes	No	Comment	Not applicable
4.0	This evaluation form was appropriate.	☐ Y	☐ N	☐ C	☐ NA
4.1	CARIBE WAVE/LANTEX 13 Exercise Manual provided an appropriate level of detail.	☐ Y	☐ N	☐ C	☐ NA
4.2	CARIBE WAVE/LANTEX 13 Webinars were helpful in preparing for the exercise.	☐ Y	☐ N	☐ C	☐ NA
4.3	Do you think CARIBE WAVE exercises should be conducted annually like LANTEX.	☐ Y	☐ N	☐ C	☐ NA
4.4	The IOC How to Plan, Conduct, and Evaluate Tsunami Exercises guideline (http://www.srh.noaa.gov/srh/ctwp) was useful?	☐ Y	☐ N	☐ C	☐ NA

The following section is only for Individuals and Organizations other than the Tsunami National Contact which participated in the exercise and would like to submit an evaluation.

5.1	I/My Organization received the warning/information message.	☐ Y	☐ N	☐ C	☐ NA
5.2	How did you receive the warning/information ? Please tick as many as apply: ____Telephone ____ SMS ____Cell/mobile phone broadcast ____Radio ____ TV ____Twitter ____Facebook ____ RSS ____Websites __Email (PTWC/WCATWC) ____Sirens ____ Public Announcement systems ____Police ____ Public call centre ____Door-to-door announcements ____ NOAA Weather Radio or Like Systems ____Other (please specify):	*Note answer on the following comment page*			
5.3	The warning/information was received in a timely fashion.	☐ Y	☐ N	☐ C	☐ NA
5.4	I/My Organization is aware of the potential tsunami danger zones in the area.	☐ Y	☐ N	☐ C	☐ NA
5.5	I/My Organization is better prepared for a Tsunami as a result of this exercise.	☐ Y	☐ N	☐ C	☐ NA

Please provide a general statement on your Exercise CARIBE WAVE/LANTEX 13 experience.

You may comment about international, national, provincial and/or local level aspects.

Please provide a general statement about what went well, about what did not go well and what could be improved, in both aspects exercise planning and exercise conduct.