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EXERCISE CARIBE WAVE 11
A Caribbean Tsunami Warning Exercise

Participant Handbook

23 March 2011

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EXERCISE CARIBE WAVE 11
A Caribbean Tsunami Warning Exercise

Participant Handbook

23 March 2011

**Prepared by the Intergovernmental Coordination Group
for the Tsunami and other Coastal Hazards Warning System
for the Caribbean Sea and Adjacent Regions**

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APPENDICES

1. BACKGROUND

The **Exercise CARIBE WAVE 11/LANTEX** is being conducted to assist tsunami preparedness efforts throughout the Caribbean region. Recent events, such as the 2004 Indian Ocean, 2009 Samoa, and 2010 Haiti and Chile 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 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.

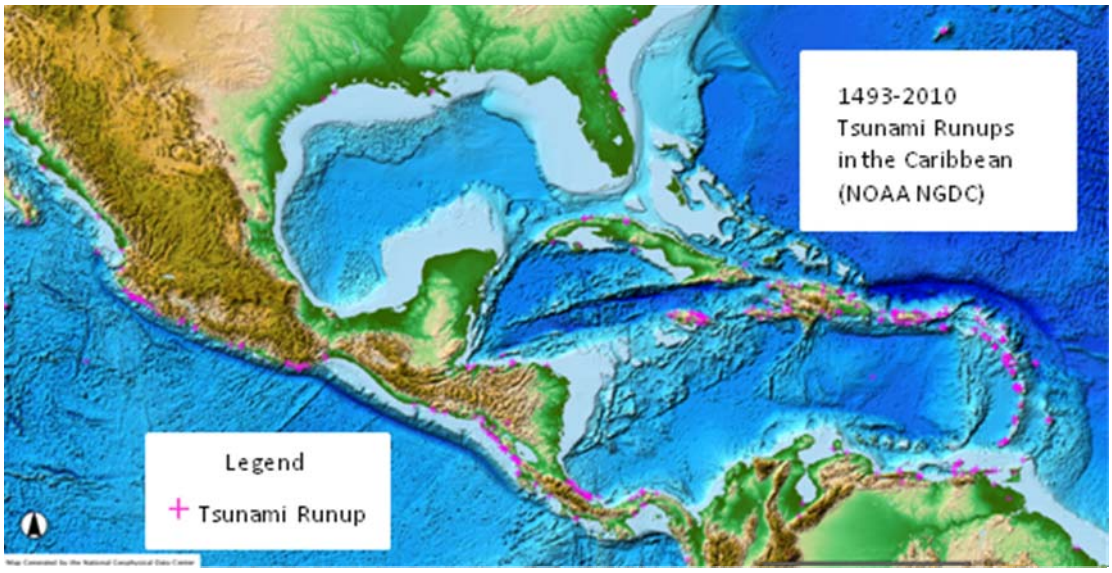

Figure 1. Map of tsunami runups in the Caribbean 1493-2010 (National Geophysical Data Center, http://www.ngdc.noaa.gov/hazards/tsu.shtml)

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 (Tarr *et al*., 2007).

In the northeastern Caribbean, the Puerto Rico Trench, roughly parallel to and about 75 miles off the northern coast of Puerto Rico, is about 900 kilometres (560 miles) long and 100 kilometres (60 miles) wide (Figure 3). At 8,350 metres (27,362 feet) below the sea surface, the trench is deepest point in the Atlantic Ocean. The Hispaniola Trench parallels the north coast of the Dominican Republic and Haiti, and is 550 kilometres (344 miles) long and only 4,500 metres (14,764 feet) deep. The Virgin Islands and Anegada troughs cut across the Antilles arc between the northern Virgin Islands and St.Croix and the Lesser Antilles. Tsunamis could be generated along these different structures, but the direction and size of the waves would depend on many factors, including where the earthquake occurred.

In 1867, a M 7.3 earthquake occurred within the basin that generated a tsunami with wave heights near 7.6 metres in St. Croix, U.S.V.I; 10 m in Deshaies, Guadeloupe; and was observed across the Northeastern and Eastern Caribbean (Reid and Taber, 1920; Watlington, 1997). This event will be used as the basis for this exercise.

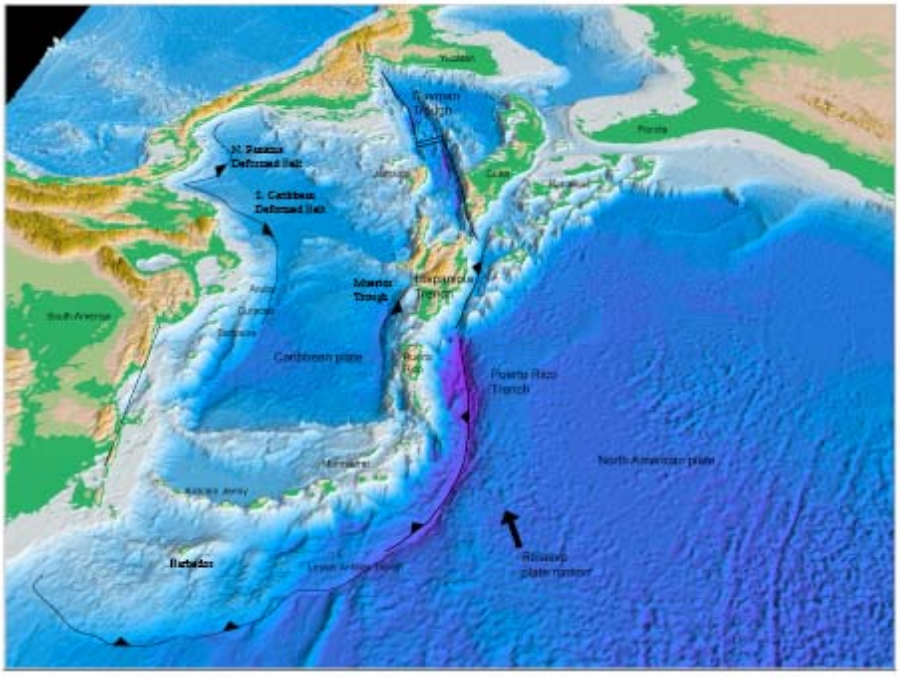

Figure 2. Tectonic features in the Caribbean (ten Brink et al., 2008).

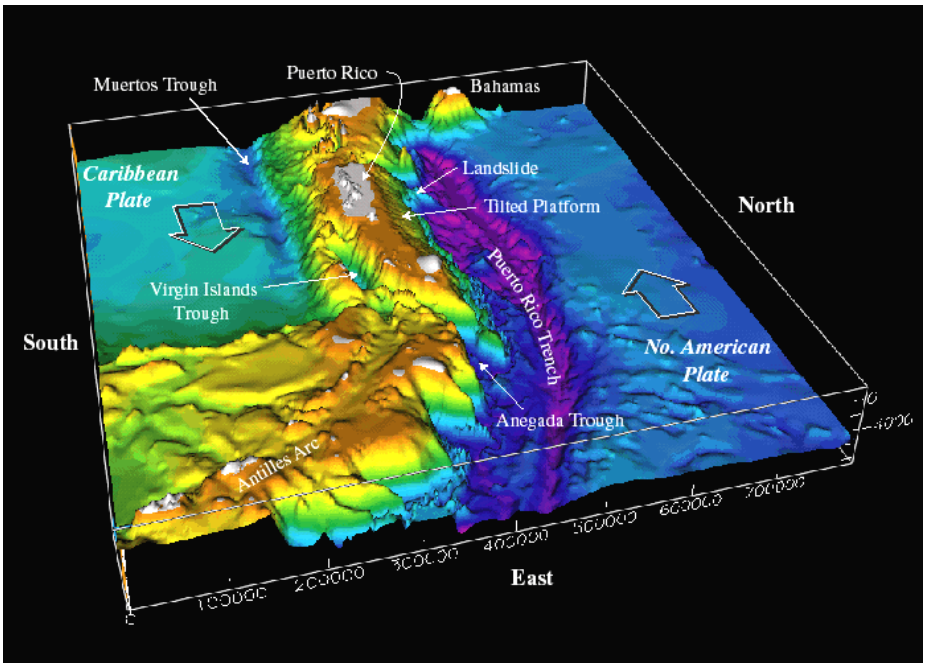

Figure 3. Tectonic features in the northeastern Caribbean (ten Brink et al., 2008).

Tsunami warning services for the Caribbean are currently provided by the West Coast/Alaska Tsunami Warning Center (WC/ATWC) in Palmer, Alaska for Puerto Rico and the Virgin Islands, while the Pacific Tsunami Warning Center (PTWC) in Ewa Beach, Hawaii is providing services for the non-US Caribbean. These centres issue tsunami products to the region approximately two to ten minutes after an earthquake's occurrence. The WC/ATWC products include warnings, advisories, watches, and information statements, while the PTWC products include tsunami information and watch messages. Primary recipients of Tsunami

Warning Centre (TWC) messages include national tsunami warning focal points, Weather Forecast Offices (WFO), state/territory warning points/emergency operation centres, 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, La Fundación Venezolana de Investigaciones Sismológicas (FUNVISIS) in Venezuela, and other national and regional institutions also provide earthquake and tsunami information for their areas of responsibilities.

The United Nations 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, watch, and advisory messages from the TWCs based on a hypothetical magnitude 7.6 earthquake located near the U.S. Virgin Islands at 18.2^{o}N, 65.3^{o}W. Exercises like this will help ensure that Caribbean coasts are ready to respond in the event of a dangerous tsunami. Similar recent exercises in the Pacific and Atlantic Basins have proven effective in strengthening preparedness levels of emergency management organizations.

2. CONCEPT OF THE EXERCISE

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 its objectives for the exercise depending on their level of involvement in the scenario.

The following are the exercise's overarching objectives:

1. Ensure message transmission from the TWCs to Tsunami Warning Focal Points (TWFP) and from these primary contacts to the EMOs.
2. Test tsunami response plans for Caribbean EMOs that have developed plans, and provide a catalyst for countries and EMOs that have not developed plans.
3. EMOs, Tsunami Warning Focal Points (TFWP) and Tsunami National Contacts review, discuss, and evaluate the various communication alternatives for receiving and disseminating tsunami messages.

4. EMOs, Tsunami Warning Focal Points and Tsunami National Contacts review, discuss, and evaluate potential response actions and challenges.

5. Identify processes to issue local all-clear notices.

2.3 TYPE OF EXERCISE

The exercise should be carried out so 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.

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 11/LANTEX 11.

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 programme. 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 I 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 centre, emergency command centre, command post, master control centre, 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 programme 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 centres 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 weeks	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

The tsunami source is based roughly on observations of the 1867 Virgin Islands earthquake and tsunami. Background information on the 1867 event was obtained from: *Disaster and Disruption in 1867: Hurricane, Earthquake, and Tsunami in the Danish West Indies* (Watlington and Lincoln, 1997), *Caribbean Tsunamis* (O'Laughlin & Lander, 2003), the USC tsunami website (see below), *The 1867 Virgin Island Tsunami* (Zahibo, 2003), the USGS report for the Nuclear Regulatory Commission: *Evaluation of Tsunami Sources with the Potential to Impact the U.S. Atlantic and Gulf of Mexico Coasts* (ten Brink *et al.*, 2008), and *Tsunami Simulations of the 1867 Virgin Island Earthquake: Constraints on Epicenter Location and Fault Parameters* (Barkan and ten Brink, 2010). The tsunami inundation maps for Puerto Rico included Virgin Islands/Anegada trough scenarios based on *Mode of Faulting in the Local Zone of Puerto Rico (LZPR)* by Huérfano Moreno (2003). A brief summary of the 1867 event can be found at the University of Southern California's (USC) Tsunami Research Group's website at http://www.usc.edu/dept/tsunamis/caribbean/webpages/1867viindex.html. The approximate historic epicentre (based on USC information) is shown in the figure 4 below.

Tsunami models were computed using WC/ATWC's Alaska Tsunami Forecast Model (ATFM) and PTWC's Rapid Inundation and 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. Based on the models, the exercise was limited to the Caribbean region, and does not include other TWC areas-of-responsibility in the Atlantic or Gulf of Mexico. The tsunami models are based on the 1867 event as a double quake source in the Virgin Islands Trough with approximately 60 km

between epicentres and 5 minutes between origin times. The earthquake source parametres are:

Source 1:

time = 1300 UTC, Mw 7.6, epicenter at {18.21N, 65.26W}, strike = 71^{o}, dip, 8^{o}, slip 90^{o}.

Source 2:

time = 1305 UTC, Mw 7.6, epicenter at {18.36N, 64.73W}, strike = 71^{o}, dip, 8^{o}, slip 90^{o}.

Sea floor displacement formulae were used to generate the two initial uplifts, and the ATFM computed tsunami propagation from those sources to produce forecast amplitudes along the U.S. Atlantic and Gulf of Mexico coasts, and throughout the Caribbean. Appendix II provides model results.

Figure 4. Approximate location of November 18, 1867 earthquake and tsunami.

Initially, a tsunami warning is issued by WC/ATWC which includes Puerto Rico and the Virgin Islands, while PTWC issues a Regional Tsunami Watch. The U.S. East coast and the Gulf of Mexico is included in the WC/ATWC message as information only since the tsunami threat there is minimal. Definitions of the products that will be issued by the TWCs during this exercise are provided below (Note that PTWC products differ from WC/ATWC products due to requirements set forth by the ICG/CARIBE-EWS):

West Coast Alaska Tsunami Warning Centre

Tsunami Warning - A tsunami warning is issued when a potential tsunami with significant widespread inundation is imminent or expected. Warnings alert the public that widespread, dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after arrival of the initial wave. Warnings also 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.

Tsunami Advisory - A tsunami advisory is issued due to the threat of a potential tsunami which may produce strong currents or waves dangerous to those in or near the water. Coastal regions historically prone to damage due to strong currents induced by tsunamis are at the greatest risk. The threat may continue for several hours after the arrival of the initial wave, but significant widespread inundation is not expected for areas under an advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbours and marinas, and the repositioning of ships to deep waters when there is time to safely do so. Advisories are normally updated to continue the advisory, expand/contract affected areas, upgrade to a warning, or cancel the advisory.

Pacific Tsunami Warning Centre

Tsunami Watch – Watches are issued by the TWCs based on seismic information without confirmation that a destructive tsunami is underway. It is issued as a means of providing an advance alert to areas that could be impacted by destructive tsunami waves. Watches are updated at least hourly to continue them, expand their coverage, upgrade them to a Warning, or end the alert. A Watch for a particular area may be included in the text of the message that disseminates a Warning for another area.

Tsunami Information Bulletin (TIB) – A text product is issued to inform that an earthquake has occurred and to advise regarding its potential to generate a tsunami. In most cases, a Tsunami Information Bulletin indicates there is no threat of a destructive tsunami, and are used to prevent unnecessary evacuations as the earthquake may have been felt in coastal areas. A Tsunami Information Bulletin may, in appropriate situations, caution about the possibility of a destructive local tsunami. A supplemental Tsunami Information Bulletin may be issued if important additional information is received such as a sea level reading showing a tsunami signal. A Tsunami Information Bulletin may also be upgraded to a watch, advisory, or warning if appropriate.

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 23 March 2011. However, messages from the TWCs will be emailed and faxed to specific recipients who have requested live dissemination throughout the event. The content of the dummy message is given in Appendix III. 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 fax. 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 IV) 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 listed in Table 2.

During real events, the WC/ATWC issues two official products each time a message is issued. The first, and the ones provided in Appendix IV, are known as the standard message. This message is a segmented message which includes encoded NWS zones, Valid Time Event Codes (VTEC), and their level of threat in the lower section of the message. The segmentation is used for automated processing systems which parse NWS products. The standard product also lists expected arrival times. The second product is known as the public message. This message has no segmentation and is written in a non-tabular, easier-to-read format. The products contain the same basic information. EMOs generally use the standard product for warning response as it has more complete information. WC/ATWC also issues additional graphical and web-based products to its website. Examples of these are shown in Appendix V.

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 IV, will facilitate this approach. For this exercise, in addition to the first dummy message, the WC/ATWC and the PTWC will email and fax the messages to the participants who have requested this service.

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)

Table 1. Scenario Timeline.

Tsunami generated by a magnitude 7.6 earthquake with epicentre at 18.2 ºN, 65.3 ºW occurring on 23 March 2011 at 1300 UTC and a second nearby earthquake which occurs 5 minutes later. The initial warning is being disseminated at 1302 UTC.

Date (UTC)	Time (UTC)	WC/ATWC Message				PTWC Message			
		#	Type	Dummy	Email	#	Type	Dummy	Email
03/23/2011	1300		------Earthquake Occurs------						
03/23/2011	1302	01	Warn	Yes	Yes	01	Watch	Yes	Yes
03/23/2011	1332	02	Warn	No	Yes				
03/23/2011	1401	03	Warn	No	Yes	02	Watch	No	Yes
03/23/2011	1431	04	Warn	No	Yes				
03/23/2011	1500	05	Warn	No	Yes	03	Watch	No	Yes
03/23/2011	1530	06	Warn	No	Yes				
03/23/2011	1601	07	Adv	No	Yes	04	Watch	No	Yes
03/23/2011	1630	08	Adv	No	Yes				
03/23/2011	1701	09	Can	No	Yes	05	Watch	No	Yes
03/23/2011	1802					06	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 request this service, please contact Christa von Hillebrandt (address listed in 3.5) with your organization name and email address.

TWC Message Types:

Warn	Tsunami Warning
Advisory	Tsunami Advisory
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 Types Issued for Dummy Message with Transmission Methods

Centre	WMO ID	AWIPS ID	NWWS	GTS	EMWIN	Fax	Email
WCATWC	WEXX20 PAAQ	TSUAT1	Yes	Yes	Yes	Yes	Yes
PTWC	WECA41 PHEB	TSUCAX	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 selected recipients. 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 11/LANTEX 11**" 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
Lorna Inniss, Chair	246-228-5950	linniss@coastal.gov.bb
Francisco Garces, Vice Chair	58-212-2575153	fgarces@funvisis.gob.ve
Frederique Martini, Vice Chair	Frederique.MARTINI@developpement-durable.gouv.fr	
Christa von Hillebrandt, Vice Chair; NWS CTWP Manager	787-833-8433	christa.vonh@noaa.gov
Emilio Talavera, Chair WG1	505-22492761	emilio.talavera@gf.ineter.gob.ni
Aurelio Mercado, Chair WG2	787-265-5461	aurelio.mercado@upr.edu
Rafael Mojica, Chair WG3	787-253-4586	rafael.mojica@noaa.gov
Dimas Alonso, Chair WG4	504-2290606 x401	alonzoaguadesastres@yahoo.com
Bernardo Aliaga, Technical Secretary	33-1-45683980	b.aliaga@unesco.org
Jeremy Collymore, Ex. Director CDEMA	246-425-0386	Jeremy.Collymore@cdema.org
Walter Wintzer, CEPREDENAC	502-2362-1981-83	wwintzer@sica.int
Ivan Morales, CEPREDENAC	502-2362-1981-83	imorales@sica.int
Melinda Bailey, NWS Southern Region	817-978-1100x107	melinda.bailey@noaa.gov
Wilfredo Ramos, PREMA Rep.	787-724-0124	wramos@aemead.gobierno.pr
Jacqueline Heyliger, VITEMA Rep.	340-773-2244	jjheyliger@yahoo.com
Paul Whitmore, WC/ATWC Director	907-745-4212	paul.whitmore@noaa.gov

Person	Telephone #	Email
Bill Knight, WC/ATWC TWSO	907-745-4212	william.knight@noaa.gov
James Waddell, WC/ATWC Rep.	907-745-4212	james.waddell@noaa.gov
Charles McCreery, PTWC Director	808-689-8207	charles.mccreery@noaa.gov
Stuart Weinstein, PTWC TWSO	808-689-8207	stuart.weinstein@noaa.gov
Gerard Fryer, PTWC Rep	808-689-8207	gerard.fryer@noaa.gov
Victor Huerfano, PRSN 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. Appendix VI contains a sample press release which can be adapted as necessary.

NOAA will issue a press release several days before the exercise describing the exercise and its purpose.

4 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 11/LANTEX 11 and the development of subsequent exercises, and help response agencies document lessons learned.

Please provide feedback by 11 April 2011 at the NTHMP internet web site: http://nthmp.tsunami.gov/exercise2011.php.

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Appendix I. 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 II. Scenario Description

The tsunami source is based roughly on observations of the 1867 Virgin Islands earthquake and tsunami. Background information on the 1867 event was obtained from: "Disaster and Disruption in 1867: Hurricane, Earthquake, and Tsunami in the Danish West Indies" (Watlington and Lincoln, 1997), "Caribbean Tsunamis" (O'Laughlin & Lander, 2003), the USC tsunami website (see below), "The 1867 Virgin Island Tsunami" (Zahibo, 2003), the USGS report for the Nuclear Regulatory Commission: "Evaluation of Tsunami Sources with the Potential to Impact the U.S. Atlantic and Gulf of Mexico Coasts" (ten Brink et al, 2008) and Tsunami Simulations of the 1867 Virgin Island Earthquake: Constraints on Epicenter Location and Fault Parameters (Barkan and ten Brink, 2010).

A brief summary of the 1867 event can be found at the University of Southern California's (USC) Tsunami Research Group's website at http://www.usc.edu/dept/tsunamis/caribbean/webpages/1867viindex.html.

Tsunami models were computed using WCATWC's Alaska Tsunami Forecast Model (ATFM) and PTWC's 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. Based on the models, the exercise was limited to the Caribbean region, and does not include other TWC areas-of-responsibility in the Atlantic or Gulf of Mexico. The tsunami models are based on the 1867 event as a double quake source in the Virgin Islands Trough with approximately 60 km between epicenters and 5 minutes between origin times. The earthquake source parameters are:

Source1: time = 1300 UTC, Mw 7.6, epicenter at {18.21N, 65.26W}.
Source2: time = 1305 UTC, Mw 7.6, epicenter at {18.36N, 64.73W}.
For both events the following parameters were used:

Strike:	71^o
Dip:	8^o
Slip:	90^o
Length:	70km
Width:	35km
Depth:	7km
Moment:	$7.5x10^{27}$ dyne-cm

Sea floor displacement formulae were used to generate the two initial uplifts, and the models computed tsunami propagation from those sources to produce forecast amplitudes along the U.S. Atlantic and Gulf of Mexico coasts, and throughout the Caribbean. Model outputs are shown in the Figures below with forecast coastal amplitudes provided in the Table. The forecast amplitudes are calculated for points offshore. The height of the wave on the shore could be double that of the model outputs due to the long-period nature of tsunamis.

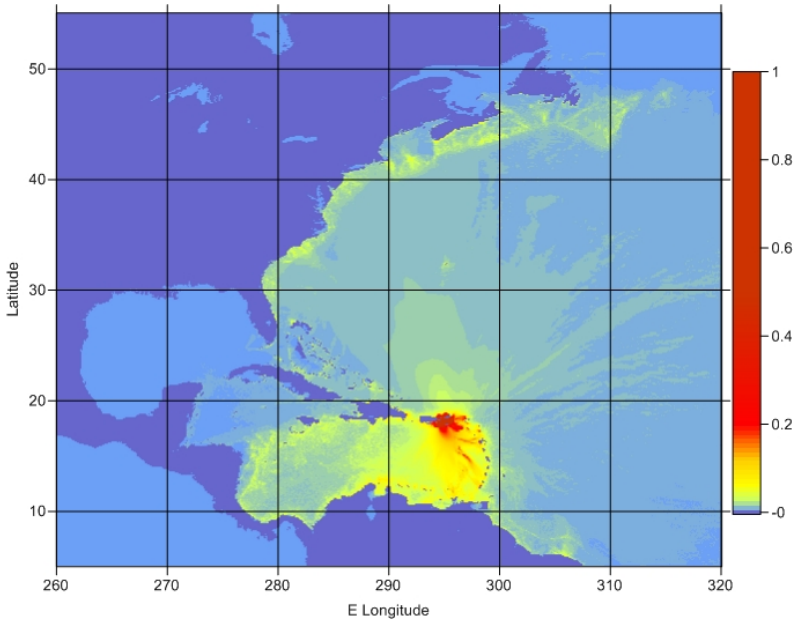

Figure II-1. Maximum modeled tsunami amplitude throughout the northern Atlantic (scale in meters - ATFM).

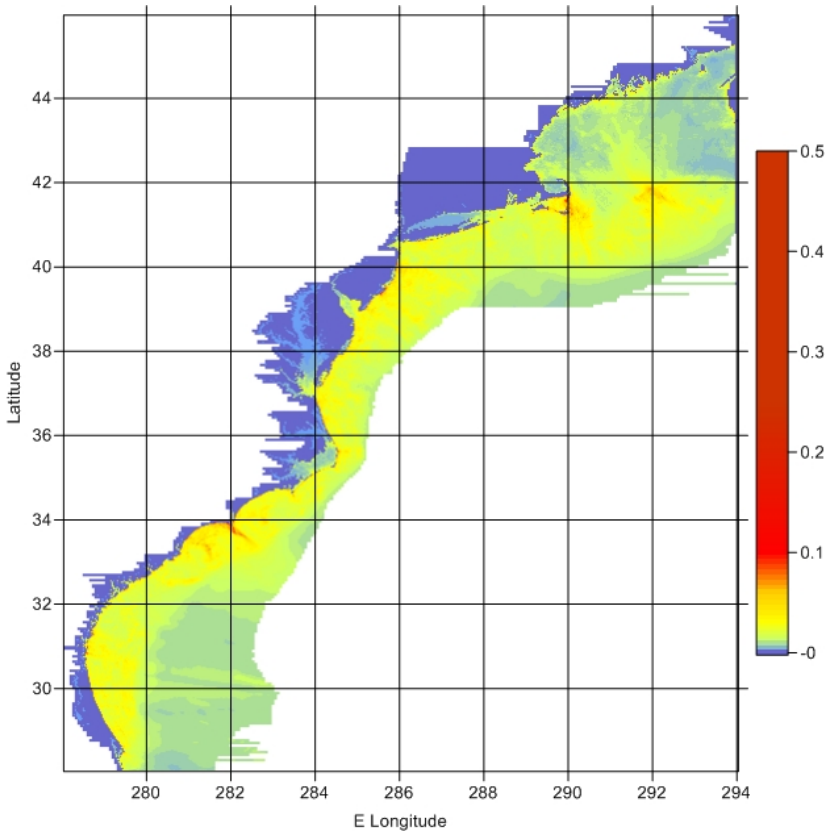

Figure II-2. Maximum modeled tsunami amplitude in the finer grids near the U.S. Atlantic coast (scale in meters - ATFM).

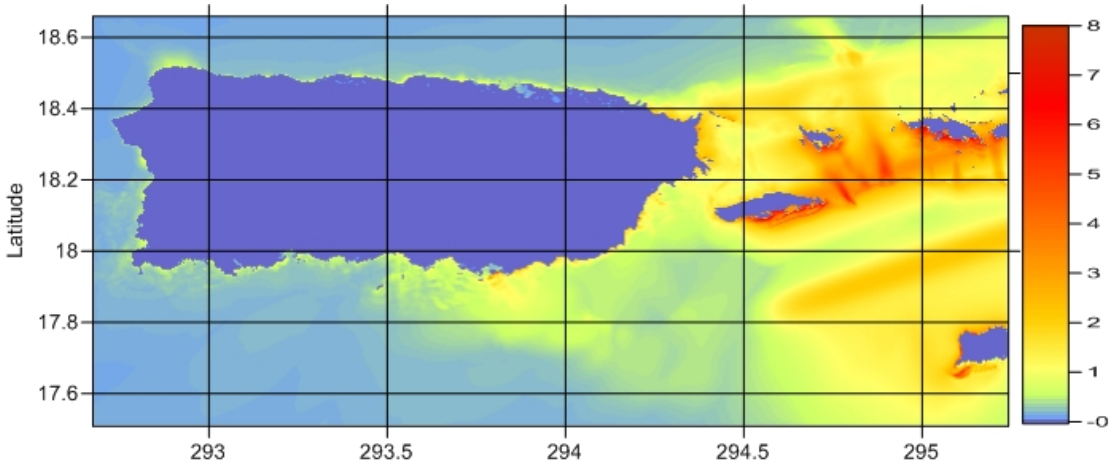

Figure II-3. Maximum modeled tsunami amplitude in the finer grids near Puerto Rico and the Virgin Islands (scale in meters - ATFM).

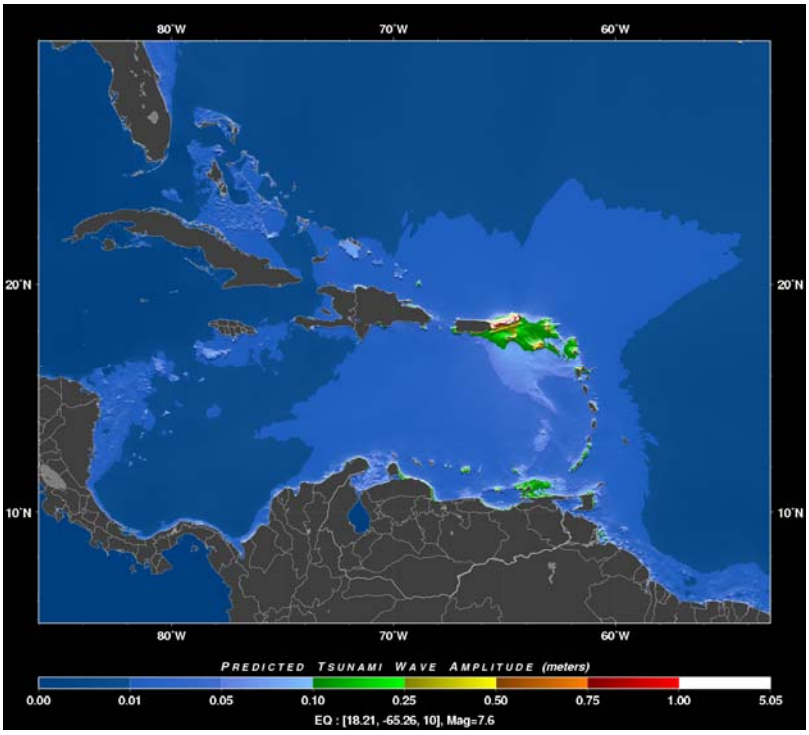

Figure II-4. Maximum modeled tsunami amplitude in the Caribbean (scale in meters - RIFT).

Location	**Travel time (hr:min)**	**Max Amp. (meters)**	**Leading Edge**
Charlotte Amalie, VI	0:01	2.7	elevation
Christiansted, VI	0:01	2.5	recession
Fajardo, PR	0:01	0.95	recession
Lameshur Bay, VI	0:02	2.85	recession
Limetree Bay, VI	0:02	4.7	recession
Virgin Gorda, BVI	0:03	1.4	recession
Culebra, PR	0:05	2.0	elevation
St. John, VI	0:07	0.26	elevation
Tortola, BVI	0:07	0.47	elevation
San Juan, PR	0:12	0.59	elevation
Mona Island, PR	0:25	0.26	recession

Location	Travel time (hr:min)	Max Amp. (meters)	Leading Edge
Magueyes Island, PR	0:28	0.75	recession
D42407	0:32	.025	recession
Aquadilla, PR	0:36	0.50	recession
Saint Kitts	0:44	1.07	recession
Anguilla	0:45	1.23	
Montserrat	0:45	0.18	recession
Mayaguez, PR	0:47	0.50	recession
Basse Terre, Guadaloupe	0:51	0.19	recession
Cabo Engano, DR	0:54	0.12	recession
Barbuda	0:55	0.13	recession
Bonaire	0:55	0.07	recession
Roseau, Dominica	0:55	0.23	recession
Saint Maarten,	1:01	0.25	recession
Santo Domingo	1:02	0.18	
Fort-de-France, Martinique	1:03	0.21	recession
St Johns, Antigua	1:03	0.24	recession
Saint Lucia	1:05	0.11	recession
Saint Vincent	1:14	0.78	recession
Curacao	1:11	0.27	recession
Aruba	1:16	0.13	recession
Grand Turk, Turks and Caicos	1:18	0.05	
St. Georges, Grenada	1:24	0.54	recession
Maiquetia, VE	1:30	0.12	recession
Puerto Plata, DR	1:30	0.04	elevation
La Guaira, VE	1:31	0.15	recession
Bridgetown, Barbados	1:38	0.05	recession
Santa Marta, CO	1:57	0.095	recession
Barranqilla, CO	2:01	0.11	recession
Bermuda	2:05	0.09	repression
Cumana, VE	2:05	0.14	elevation
Cartagena, CO	2:18	0.02	recession
Kingston, JA	2:26	0.08	recession
Porlamar, VE	2:29	0.26	
Myrtle Beach, FL	3:02	0.08	elevation
Gibara, Cuba	3:08	0.02	
Puerto Limon,_CR	3:11	0.04	recession
Riohacha, CO	3:18	0.10	recession
Punta Fijo, VE	3:42	0.085	elevation
Port Au Prince, Haiti	3:57	0.04	recession
Guantanamo Bay, Cuba	3:58	0.035	elevation
Golfo_de_Venezuela, VE	4:20	0.02	recession
Porlamar, VE	4:21	0.04	elevation
Duck, NC	4:26	0.07	recession
Trident Pier, FL	4:29	0.06	elevation
Montego Bay, JA	4:35	~0.01	?
Ocean City, MD	4:54	0.11	recession
Wrightsville, NC	5:05	0.06	elevation

Location	Travel time (hr:min)	Max Amp. (meters)	Leading Edge
Flagler Beach, FL	5:06	0.075	elevation
Key West, FL		< 0.01	
Georgetown, Guyana	5:12	0.04	
Atlantic City, NJ	5:14	0.19	recession
Sunset Beach, NC	5:24	0.14	recession
Port-O-Spain	5:24	~0.01	recession
Springmaid Pier, SC	5:36	0.06	recession
Oregon Inlet, SC	5:44	0.02	elevation
Charleston, SC	5:48	0.03	elevation
Nantucket Is., MA	6:24	0.085	elevation
Providence, RI	7:03	0.055	elevation

Table II-1: Coastal amplitude forecast for event (ATFM and RIFT).The amplitude is the elevation of the tsunami above sea level.The amplitude does not take into account uplift or subsidence of the location due to the earthquake.Also the amplitude is measure offshore, the onshore heights could be double those of the forecast models.

Tsunami Event

Date						Tsunami Cause		Tsunami Source Location				Tsunami Parameters				
Year	Mo	Dy	Hr	Mn	Sec	Val	Code	Country	Name	Latitude	Longitude	Max Water Height	Magnitude Abe	Magnitude Iida	Tsu Int	Warn Status
1867	11	18	18	45		4	1	USA TERRITORY	VIRGIN ISLANDS	18.100	-65.100	10.00		2.30		

Tsunami Runups

Addl Info	Doubtful Runup	Tsunami Runup Location						Tsunami Runup Measurements					Tsunami Runup Location Effects									
		Country	State/ Province/ Prefecture	Name	Latitude	Longitude	Distance from Source	Travel Time Hrs	Travel Time Min	Max Water Height	Max Inundation Distance	Type	1st Mtn Per	1st Mtn	Deaths Num	Deaths De	Injuries Num	Injuries De	Damage $Mill	Damage De	Houses Destroyed Num	Houses Destroyed De	Houses Damaged Num	Houses Damaged De
*		ANTIGUA AND BARBUDA		ANTIGUA: ST. JOHNS	17.193	-62.416	302			2.40		1												
*		ANTIGUA AND BARBUDA		BARBUDA: WEST COAST	17.717	-61.817	350			1.40		1												
*		BRITISH VIRGIN ISLANDS		PETER'S ISLAND	18.367	-64.633	58			1.20		1												
*		BRITISH VIRGIN ISLANDS		TORTOLA ISLAND: ROAD TOWN	18.414	-64.616	62			1.50	9.00	1		F					1		2			
*		DOMINICA		RUPERT'S BAY	15.500	-61.333	494			3.00		1												
*		GRENADA		GOUYAVE (CHARLOTTE TOWN)	12.167	-61.733	752			3.00		1							1					
*		GRENADA		SAINT GEORGE'S	12.015	-61.778	765			1.50		1		F										
*		GUADELOUPE		BASSE TERRE	16.000	-61.717	429			1.00		1												
*		GUADELOUPE		DESHAIES	16.317	-61.783	404			10.00		1		F					2					
*		GUADELOUPE		ILES DES SAINTES: FOND-DU-CIRE	15.867	-61.617	446			1.00		1							2					
*		GUADELOUPE		POINTE-A-PITRE	16.233	-61.533	432					1												
*		GUADELOUPE		SAINT BARTHELEMY ISLAND	17.900	-62.833	241					1							1					
*		GUADELOUPE		SAINT MARTIN	18.670	-63.067	224					1							1					
*		GUADELOUPE		SAINTE-ROSE	16.333	-61.700	411			10.00		1		F					2					
*		MARTINIQUE		MARTINIQUE	14.667	-61.000	581					1												
*		NETHERLANDS ANTILLES		SABA ISLAND	17.633	-63.233	204					1												
*		SAINT KITTS AND NEVIS		SAINT KITTS: BASSETERRE	17.300	-62.717	268				2.40	1		F										
*		SAINT LUCIA		LAVON, ANSE-LA-RAYE	13.883	-60.967	644			.90		1												
*		SAINT VINCENT AND THE GRENADINES		BEQUIA ISLAND: ADMIRALTY BAY	13.280	-61.250	676			1.80	146.00	1							1		2			
*		SAINT VINCENT AND THE GRENADINES		SAINT VINCENT	13.130	-61.200	693					1												
*		USA TERRITORY	PR	PUERTO RICO: ARROYO	17.983	-66.050	101			.90	40.00	1												
*		USA TERRITORY	PR	PUERTO RICO: BAHIA DE SAN JUAN	18.450	-66.117	114			.90		1		F										
*		USA TERRITORY	PR	PUERTO RICO: PLAYA DE FAJARDO	18.333	-65.633	62					1		F										
*		USA TERRITORY	PR	PUERTO RICO: VIEQUES	18.150	-65.450	37					1		F										
*		USA TERRITORY	PR	PUERTO RICO: YABUCOA	18.033	-65.883	83			1.37		1		F										
*		USA TERRITORY	VI	VIRGIN ISLANDS: ALTONA	18.341	-64.949	31				76.20	1							2		2			
*		USA TERRITORY	VI	VIRGIN ISLANDS: CHARLOTTE AMALIE	18.333	-64.917	32			6.00		1	10	F	12	1			2					
*		USA TERRITORY	VI	VIRGIN ISLANDS: CHISTIANSTED	17.767	-64.733	54				91.00	1		F										
*		USA TERRITORY	VI	VIRGIN ISLANDS: FREDERIKSTED	17.717	-64.883	48	0	12	7.60	76.00	1		F	5	1			1		20	1		
*		USA TERRITORY	VI	VIRGIN ISLANDS: GALLOWS BAY	17.600	-64.700	70					1							1		20	1		
*		USA TERRITORY	VI	VIRGIN ISLANDS: HASSEL ISLAND	18.300	-64.960	27			4.90		1			3	1								
*		USA TERRITORY	VI	VIRGIN ISLANDS: SABA ISLAND	18.341	-64.982	30					1			10	1								
*		USA TERRITORY	VI	VIRGIN ISLANDS: SAINT CROIX	17.750	-64.750	54			7.00		1												

Figure II-5. Historical Tsunami Data for the 1867 Event (NGDC)

Appendix III. TWC Dummy Messages

WCATWC

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WEXX20 PAAQ 231302
TSUAT1

TEST...TSUNAMI EXERCISE MESSAGE NUMBER 1...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
902 AM AST WED MAR 23 2011

...CARIBE WAVE 11/LANTEX 11 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 11/LANTEX 11 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 231302
TSUCAX

TEST...TSUNAMI EXERCISE MESSAGE NUMBER 1...TEST
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1302Z 23 MAR 2011

...CARIBE WAVE 11/LANTEX 11 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 11/LANTEX 11 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 IV. TWC Exercise Messages

The following messages, created for the CARIBE WAVE 11/LANTEX 11 tsunami exercise, are representative of the official standard products issued by the WCATWC and PTWC during a large magnitude 7.6 earthquake and tsunami originating 25 miles southeast of Fajardo, Puerto Rico and 60 miles southeast of San Juan, Puerto Rico at 18.2°N, 65.3°W. During a real event, the TWCs would also issue graphical and html-based products to their web sites and via RSS.

Appendix IV. Messages pour l'exercice des TWC

Les messages suivants, créés pour l'exercice de simulation de tsunami CARIBE WAVE 11/LANTEX 11, sont représentatifs des produits normalisés officiels émis par le WCATWC et le PTWC pendant un séisme de magnitude 7,6 et un tsunami ayant son origine à 40 kilomètres au sud-est de Fajardo (Porto Rico) et à 96 kilomètres de San Juan (Porto Rico) à 18.2oN, 65.3oO. Pendant un événement réel, les TWC émettraient aussi des produits graphiques et HTML par l'intermédiaire du RSS.

Apéndice IV. Mensajes de los Centros de Alerta contra Tsunamis para el Ejercicio

Los siguientes mensajes, creados para el Ejercicio CARIBE WAVE 11/LANTEX 11, son representativos de los productos oficiales estándar que emiten el WCATWC y el PTWC durante un gran terremoto de magnitud 7,6 y un tsunami que se origina a 25 millas al sudeste de Fajardo, en Puerto Rico y 60 millas al sudeste de San Juan, Puerto Rico, en 18º2 N, 65º3 O. Durante un evento real, los centros de alerta contra tsunamis también difundirían productos gráficos y html en sus sitios web, y ficheros RSS.

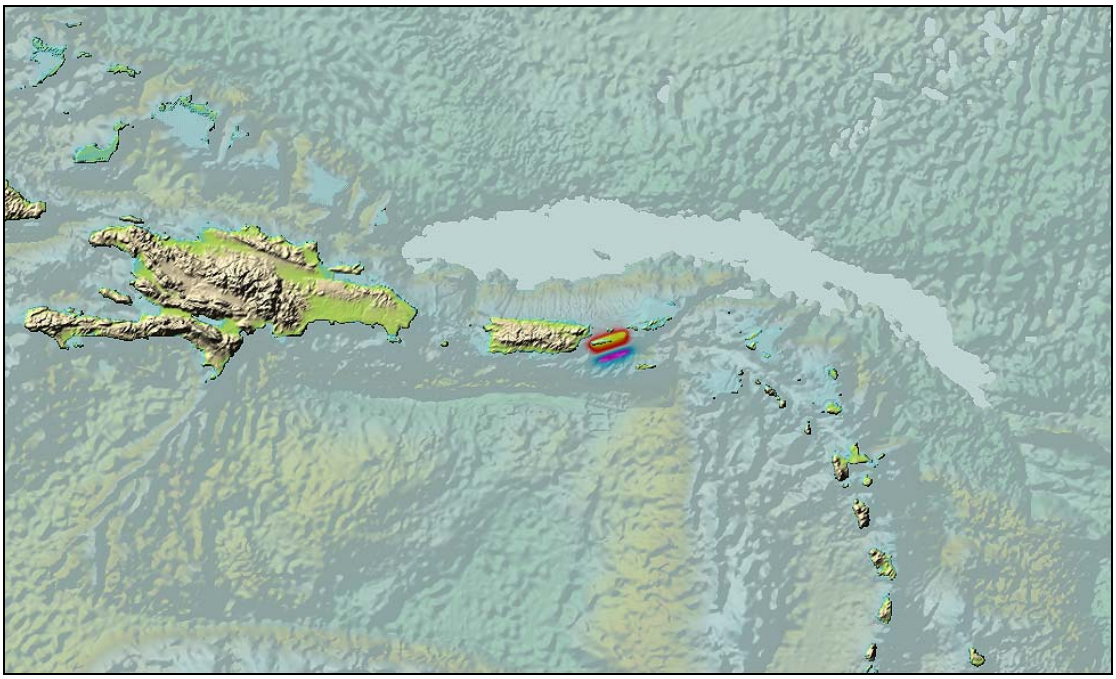

Figure IV-1. Tsunami source at zero minutes

WCATWC Message #1

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WEXX20 PAAQ 231302
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 1
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
902 AM AST WED MAR 23 2011
...A TSUNAMI WARNING IS NOW IN EFFECT FOR PUERTO RICO AND
   THE VIRGIN ISLANDS...

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

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

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 0900  EDT MAR 23 2011
             0900  AST MAR 23 2011
             0800  CDT MAR 23 2011
             1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED MAINLY ON EARTHQUAKE DATA. EARTHQUAKES OF
THIS SIZE OFTEN GENERATE DANGEROUS TSUNAMIS. AS MORE INFORMATION
BECOMES AVAILABLE THE WARNING AREAS WILL BE REFINED.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231402-
/T.NEW.PAAQ.TS.W.0003.110323T1302Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
902 AM AST WED MAR 23 2011

...A TSUNAMI WARNING IS NOW IN EFFECT FOR PUERTO RICO AND
   THE VIRGIN ISLANDS...

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

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

CHRISTIANSTED-VI 0911  AST MAR 23 MAYAGUEZ-PR      0952  AST MAR 23
SAN JUAN-PR      0945  AST MAR 23 CHARLOT AMALI-VI 0955  AST MAR 23
FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE WCATWC.ARH.NOAA.GOV
```

PTWC Message #1

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WECA41 PHEB 231302
TSUCAX

TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1302Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT
PUERTO RICO AND THE VIRGIN ISLANDS.  THE WEST COAST/
ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR
THESE AREAS.

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

A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS -
MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT
MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE -
CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA -
HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA -
TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

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

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

 ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES
 MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST.  THE TIME
 BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

 LOCATION                              COORDINATES   ARRIVAL TIME
 ------------------------------------------------------------------
SAINT MAARTEN    SIMPSON BAAI          18.0N  63.1W  1336Z MAR23
SABA             NETH ANTILLES         17.6N  63.2W  1338Z MAR23
ST EUSTATIUS     NETH ANTILLES         17.5N  63.0W  1344Z MAR23
ANGUILLA         THE VALLEY            18.3N  63.1W  1345Z MAR23
SAINT KITTS      BASSETERRE            17.3N  62.7W  1352Z MAR23
MONTSERRAT       PLYMOUTH              16.7N  62.2W  1354Z MAR23
DOMINICAN REP    CABO ENGANO           18.6N  68.3W  1354Z MAR23
GUADELOUPE       BASSE-TERRE           16.0N  61.7W  1401Z MAR23
DOMINICAN REP    SANTO DOMINGO         18.5N  69.9W  1402Z MAR23
DOMINICA         ROSEAU                15.3N  61.4W  1404Z MAR23
SAINT MARTIN     BAIE BLANCHE          18.1N  63.0W  1405Z MAR23
BARBUDA          PALMETTO POINT        17.6N  61.9W  1410Z MAR23
MARTINIQUE       FORT-DE-FRANCE        14.6N  61.1W  1411Z MAR23
SAINT LUCIA      CASTRIES              14.0N  61.0W  1412Z MAR23
DOMINICAN REP    PUERTO PLATA          19.8N  70.7W  1413Z MAR23
BONAIRE          ONIMA                 12.3N  68.3W  1414Z MAR23
CURACAO          WILLEMSTAD            12.1N  68.9W  1418Z MAR23
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TURKS N CAICOS	GRAND TURK	21.5N	71.1W	1418Z MAR23
ST VINCENT	KINGSTOWN	13.1N	61.2W	1419Z MAR23
ANTIGUA	SAINT JOHNS	17.1N	61.9W	1425Z MAR23
GRENADA	SAINT GEORGES	12.0N	61.8W	1428Z MAR23
HAITI	CAP-HAITEN	19.8N	72.2W	1430Z MAR23
ARUBA	ORANJESTAD	12.5N	70.0W	1433Z MAR23
TURKS N CAICOS	WEST CAICOS	21.7N	72.5W	1434Z MAR23
VENEZUELA	MAIQUETIA	10.6N	67.0W	1436Z MAR23
BAHAMAS	MAYAGUANA	22.3N	73.0W	1437Z MAR23
BARBADOS	BRIDGETOWN	13.1N	59.6W	1439Z MAR23
VENEZUELA	CUMANA	10.5N	64.2W	1442Z MAR23
BAHAMAS	GREAT INAGUA	20.9N	73.7W	1444Z MAR23
CUBA	BARACOA	20.4N	74.5W	1448Z MAR23
HAITI	JEREMIE	18.6N	74.1W	1450Z MAR23
TRINIDAD TOBAGO	PIRATES BAY	11.3N	60.6W	1451Z MAR23
BAHAMAS	SAN SALVADOR	24.1N	74.5W	1452Z MAR23
BAHAMAS	CROOKED IS	22.7N	74.1W	1455Z MAR23
CUBA	SANTIAGO D CUBA	19.9N	75.8W	1458Z MAR23
COLOMBIA	SANTA MARTA	11.2N	74.2W	1501Z MAR23
COLOMBIA	RIOHACHA	11.6N	72.9W	1501Z MAR23
COLOMBIA	BARRANQUILLA	11.1N	74.9W	1504Z MAR23
BAHAMAS	ELEUTHERA IS	25.2N	76.1W	1507Z MAR23
CUBA	GIBARA	21.1N	76.1W	1508Z MAR23
JAMAICA	MONTEGO BAY	18.5N	77.9W	1516Z MAR23
COLOMBIA	CARTEGENA	10.4N	75.6W	1516Z MAR23
BAHAMAS	NASSAU	25.1N	77.4W	1519Z MAR23
VENEZUELA	PUNTO FIJO	11.7N	70.2W	1521Z MAR23
JAMAICA	KINGSTON	17.9N	76.9W	1525Z MAR23
BAHAMAS	ABACO IS	26.6N	77.1W	1525Z MAR23
HAITI	PORT-AU-PRINCE	18.5N	72.4W	1527Z MAR23
VENEZUELA	PORLAMAR	10.9N	63.8W	1529Z MAR23
TRINIDAD TOBAGO	PORT-OF-SPAIN	10.6N	61.5W	1541Z MAR23
BAHAMAS	FREEPORT	26.5N	78.8W	1542Z MAR23
CUBA	CIENFUEGOS	22.0N	80.5W	1552Z MAR23
VENEZUELA	GOLFO VENEZUELA	11.4N	71.2W	1554Z MAR23
COLOMBIA	PUNTA CARIBANA	8.6N	76.9W	1600Z MAR23
CUBA	SANTA CRZ D SUR	20.7N	78.0W	1703Z MAR23
CUBA	LA HABANA	23.2N	82.4W	1703Z MAR23
CUBA	NUEVA GERONA	21.9N	82.8W	1806Z MAR23
GUYANA	GEORGETOWN	6.8N	58.2W	1812Z MAR23

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

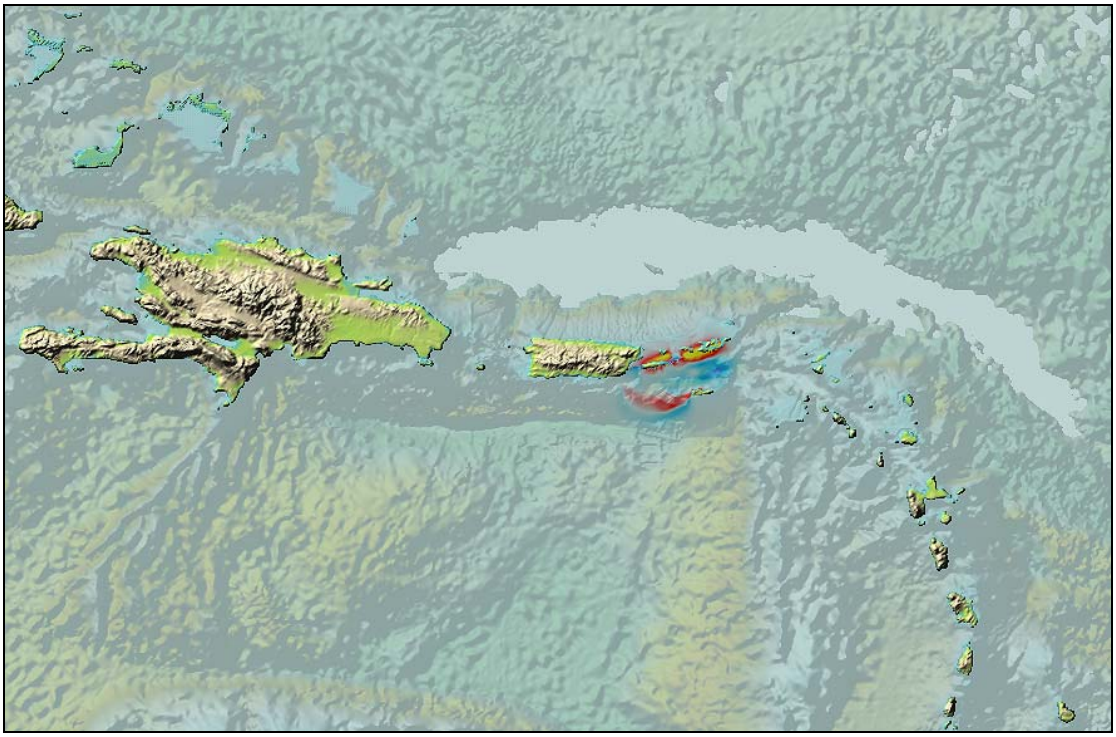

Figure IV-2. Tsunami at ten minutes.

WCATWC Message #2

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WEXX20 PAAQ 231332
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 2
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
932 AM AST WED MAR 23 2011

THIS MESSAGE CONTAINS NEW OBSERVATIONS AND INFORMATION ON AN
AFTERSHOCK.

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

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

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

A 7.6 MW AFTERSHOCK WAS RECORDED AT 1305 UTC - 5 MINUTES AFTER THE INITIAL QUAKE.
ITS EPICENTER WAS POSITIONED AT 18.36N 64.73W.  FIGURES WITHIN WCATWC MESSAGES
REFLECT THE IMPACT OF BOTH QUAKES ON THE EVENT.

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES
LOCATION                   LAT    LON         TIME          AMPL
---------------            -----  ------      -------  ---------------
CHRISTIANSTED VI           17.7N  64.7W       906 AST   8.23 FT/2.51 M
LIMETREE BAY VI            17.6N  64.6W       909 AST  15.41 FT/4.70 M
CHARLOTTE AMALIE VI        18.3N  65.0W       909 AST   8.83 FT/2.69 M
LAMESHUR BAY VI            18.3N  64.7W       918 AST   9.37 FT/2.86 M
CULEBRA PR                 18.3N  65.3W       921 AST   6.79 FT/2.07 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

WAVES OF THIS SIZE ARE KNOWN TO CAUSE INUNDATION AND DAMAGE TO
COASTAL STRUCTURES.  TSUNAMIS ARE EXPECTED TO CONTINUE AT DANGEROUS
LEVELS FOR AT LEAST TWO HOURS.  A 15.0-FOOT/4.6-METER TSUNAMI IN
LIMETREE BAY VI WAS WITNESSED TEARING THE BOARDS FROM A LOCAL
PIER AND PUSHING THREE BOATS ASHORE.

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 0900  EDT MAR 23 2011
             0900  AST MAR 23 2011
             0800  CDT MAR 23 2011
             1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN
ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES
FOR INFORMATION ON THIS EVENT AT WWW.PRH.NOAA.GOV/PR/PTWC.
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THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231432-
/T.CON.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
932 AM AST WED MAR 23 2011

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

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

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

CHRISTIANSTED-VI 0911  AST MAR 23 MAYAGUEZ-PR      0952  AST MAR 23
SAN JUAN-PR      0945  AST MAR 23 CHARLOT AMALI-VI 0955  AST MAR 23
FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

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WCATWC Message #3

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WEXX20 PAAQ 231401
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 3
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1001 AM AST WED MAR 23 2011

THIS MESSAGE CONTAINS MORE OBSERVED TSUNAMI AMPLITUDES AND
DAMAGE INFORMATION.

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

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

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES
LOCATION                    LAT    LON         TIME          AMPL
---------------            ----- ------      ------- ---------------
CHRISTIANSTED VI           17.7N  64.7W      906 AST  8.23 FT/2.51 M
LIMETREE BAY VI            17.6N  64.6W      909 AST 15.41 FT/4.70 M
LAMESHUR BAY VI            18.3N  64.7W      918 AST  9.37 FT/2.86 M
VIRGIN GORDA BVI           18.5N  64.5W      919 AST  4.59 FT/1.40 M
CULEBRA PR                 18.3N  65.3W      921 AST  6.79 FT/2.07 M
CHARLOTTE AMALIE VI        18.4N  64.9W      945 AST  8.27 FT/2.52 M
MONA ISLAND PR             18.1N  67.9W      948 AST  0.85 FT/0.26 M
MAGUEYES ISLAND PR         18.2N  67.2W      951 AST  2.48 FT/0.76 M
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TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

INITAL DAMAGE REPORTS NOTE FLOODED STREETS IN CHRISTIANSTED VI
AND MANY HOMES TORN FROM THE FOUNDATIONS IN LIMETREE BAY VI.

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 0900  EDT MAR 23 2011
             0900  AST MAR 23 2011
             0800  CDT MAR 23 2011
             1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231501-
/T.CON.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1001 AM AST WED MAR 23 2011

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

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

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

CHRISTIANSTED-VI 0911  AST MAR 23 MAYAGUEZ-PR      0952  AST MAR 23
SAN JUAN-PR      0945  AST MAR 23 CHARLOT AMALI-VI 0955  AST MAR 23
FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

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PTWC Message #2

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WECA41 PHEB 231401
TSUCAX

TSUNAMI MESSAGE NUMBER 2
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1401Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT
PUERTO RICO AND THE VIRGIN ISLANDS.  THE WEST COAST/
ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR
THESE AREAS.

...A REGIONAL TSUNAMI WATCH IS IN EFFECT...
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A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS -
MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT
MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE -
CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA -
HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA -
TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETERS
MAGNITUDE - 7.6
TIME - 1300 UTC MAR 23 2011
LOCATION - 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
DEPTH - 56 MILES/90 KM

MEASUREMENTS OR REPORTS OF TSUNAMI ACTIVITY

LOCATION	LAT	LON	TIME	AMPL
CHRISTIANSTED VI	17.7N	64.7W	1306Z	8.23 FT/2.51 M
LIMETREE BAY VI	17.6N	64.6W	1309Z	15.41 FT/4.70 M
LAMESHUR BAY VI	18.3N	64.7W	1318Z	9.37 FT/2.86 M
VIRGIN GORDA BVI	18.5N	64.5W	1319Z	4.59 FT/1.40 M
CULEBRA PR	18.3N	65.3W	1321Z	6.79 FT/2.07 M
CHARLOTTE AMALIE VI	18.4N	64.9W	1345Z	8.27 FT/2.52 M
MONA ISLAND PR	18.1N	67.9W	1348Z	0.85 FT/0.26 M
MAGUEYES ISLAND PR	18.2N	67.2W	1351Z	2.48 FT/0.76 M
BASSETERRE SAINT KITTS	17.3N	62.7W	1352Z	3.21 FT/1.00 M
PLYMOUTH MONTSERRAT	16.7N	62.2W	1355Z	1.66 FT/0.51 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

SEVERE DAMAGE HAS BEEN REPORTED IN CHRISTIANSTED VI WITH NOTED
FLOODING AS FAR INLAND AS ROUTE 70. HOTEL ON THE CAY LOCATED
WITHIN THE HARBOR IS REPORTED AS TOTALLY DESTROYED WITH
SEVERAL PEOPLE REPORTED AS MISSING. WITNESSES NEAR LIMETREE
BAY VI REPORT A 15+ FOOT WAVE INUNDATING THE TANK FARM AT
JERUSALEM AND FIGTREE HILL RESULTING IN LEAKING FUEL. AN OIL
SLICK HAS BEEN NOTED IN THE AREA THAT IS 3-MILES LONG BY 500-FEET
WIDE. TWO TANKS AT THE FARM ARE CURRENTLY ON FIRE AND MANY
EMPLOYEES AT THE FACILITY ARE REPORTED MISSING. THE WAVE IN
THIS AREA IS REPORTED TO HAVE GONE PAST ROUTE 66 AND AS FAR
INLAND AS ROUTE 707. THE HENRY E. ROHLSEN AIRPORT REPORTS
FLOODING ON THE RUNWAY AND IS CURRENTLY NOT OPERATING. COMMUNICATIONS
WITH COUNTRIES IN THE NORTHEASTERN CARIBBEAN IS VERY SPORADIC AND
DAMAGE AND INUNDATION REPORTS ARE NOW JUST COMING IN.

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

THE THREAT MAY CONTINUE FOR COASTAL AREAS LOCATED WITHIN ABOUT A
THOUSAND KILOMETERS OF THE EARTHQUAKE EPICENTER. 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.

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

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES
MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME
BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	COORDINATES	ARRIVAL TIME

SAINT MAARTEN	SIMPSON BAAI	18.0N	63.1W	1336Z MAR23
SABA	NETH ANTILLES	17.6N	63.2W	1338Z MAR23
ST EUSTATIUS	NETH ANTILLES	17.5N	63.0W	1344Z MAR23
ANGUILLA	THE VALLEY	18.3N	63.1W	1345Z MAR23
SAINT KITTS	BASSETERRE	17.3N	62.7W	1352Z MAR23
MONTSERRAT	PLYMOUTH	16.7N	62.2W	1354Z MAR23
DOMINICAN REP	CABO ENGANO	18.6N	68.3W	1354Z MAR23
GUADELOUPE	BASSE-TERRE	16.0N	61.7W	1401Z MAR23
DOMINICAN REP	SANTO DOMINGO	18.5N	69.9W	1402Z MAR23
DOMINICA	ROSEAU	15.3N	61.4W	1404Z MAR23
SAINT MARTIN	BAIE BLANCHE	18.1N	63.0W	1405Z MAR23
BARBUDA	PALMETTO POINT	17.6N	61.9W	1410Z MAR23
MARTINIQUE	FORT-DE-FRANCE	14.6N	61.1W	1411Z MAR23
SAINT LUCIA	CASTRIES	14.0N	61.0W	1412Z MAR23
DOMINICAN REP	PUERTO PLATA	19.8N	70.7W	1413Z MAR23
BONAIRE	ONIMA	12.3N	68.3W	1414Z MAR23
CURACAO	WILLEMSTAD	12.1N	68.9W	1418Z MAR23
TURKS N CAICOS	GRAND TURK	21.5N	71.1W	1418Z MAR23
ST VINCENT	KINGSTOWN	13.1N	61.2W	1419Z MAR23
ANTIGUA	SAINT JOHNS	17.1N	61.9W	1425Z MAR23
GRENADA	SAINT GEORGES	12.0N	61.8W	1428Z MAR23
HAITI	CAP-HAITEN	19.8N	72.2W	1430Z MAR23
ARUBA	ORANJESTAD	12.5N	70.0W	1433Z MAR23
TURKS N CAICOS	WEST CAICOS	21.7N	72.5W	1434Z MAR23
VENEZUELA	MAIQUETIA	10.6N	67.0W	1436Z MAR23
BAHAMAS	MAYAGUANA	22.3N	73.0W	1437Z MAR23
BARBADOS	BRIDGETOWN	13.1N	59.6W	1439Z MAR23
VENEZUELA	CUMANA	10.5N	64.2W	1442Z MAR23
BAHAMAS	GREAT INAGUA	20.9N	73.7W	1444Z MAR23
CUBA	BARACOA	20.4N	74.5W	1448Z MAR23
HAITI	JEREMIE	18.6N	74.1W	1450Z MAR23
TRINIDAD TOBAGO	PIRATES BAY	11.3N	60.6W	1451Z MAR23
BAHAMAS	SAN SALVADOR	24.1N	74.5W	1452Z MAR23
BAHAMAS	CROOKED IS	22.7N	74.1W	1455Z MAR23
CUBA	SANTIAGO D CUBA	19.9N	75.8W	1458Z MAR23
COLOMBIA	SANTA MARTA	11.2N	74.2W	1501Z MAR23
COLOMBIA	RIOHACHA	11.6N	72.9W	1501Z MAR23
COLOMBIA	BARRANQUILLA	11.1N	74.9W	1504Z MAR23
BAHAMAS	ELEUTHERA IS	25.2N	76.1W	1507Z MAR23
CUBA	GIBARA	21.1N	76.1W	1508Z MAR23
JAMAICA	MONTEGO BAY	18.5N	77.9W	1516Z MAR23
COLOMBIA	CARTEGENA	10.4N	75.6W	1516Z MAR23
BAHAMAS	NASSAU	25.1N	77.4E	1519Z MAR23
VENEZUELA	PUNTO FIJO	11.7N	70.2W	1521Z MAR23
JAMAICA	KINGSTON	17.9N	76.9W	1525Z MAR23
BAHAMAS	ABACO IS	26.6N	77.1W	1525Z MAR23
HAITI	PORT-AU-PRINCE	18.5N	72.4W	1527Z MAR23
VENEZUELA	PORLAMAR	10.9N	63.8W	1529Z MAR23
TRINIDAD TOBAGO	PORT-OF-SPAIN	10.6N	61.5W	1541Z MAR23
BAHAMAS	FREEPORT	26.5N	78.8W	1542Z MAR23
CUBA	CIENFUEGOS	22.0N	80.5W	1552Z MAR23
VENEZUELA	GOLFO VENEZUELA	11.4N	71.2W	1554Z MAR23
COLOMBIA	PUNTA CARIBANA	8.6N	76.9W	1600Z MAR23
CUBA	SANTA CRZ D SUR	20.7N	78.0W	1703Z MAR23
CUBA	LA HABANA	23.2N	82.4W	1703Z MAR23
CUBA	NUEVA GERONA	21.9N	82.8W	1806Z MAR23
GUYANA	GEORGETOWN	6.8N	58.2W	1812Z MAR23

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

WCATWC Message #4

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WEXX20 PAAQ 231431
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 4
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1031 AM AST WED MAR 23 2011

THIS MESSAGE CONTAINS UPDATED TSUNAMI OBSERVATIONS AND
DAMAGE INFORMATION.

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

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

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES
LOCATION                    LAT    LON         TIME          AMPL
---------------             ----- ------      ------- ---------------
CHRISTIANSTED VI           17.7N  64.7W       906 AST   8.23 FT/2.51 M
LIMETREE BAY VI            17.6N  64.6W       909 AST  15.41 FT/4.70 M
LAMESHUR BAY VI            18.3N  64.7W       918 AST   9.37 FT/2.86 M
VIRGIN GORDA BVI           18.5N  64.5W       919 AST   4.59 FT/1.40 M
CULEBRA PR                 18.3N  65.3W       921 AST   6.79 FT/2.07 M
CHARLOTTE AMALIE VI        18.4N  64.9W       945 AST   8.27 FT/2.52 M
MONA ISLAND PR             18.1N  67.9W       948 AST   0.85 FT/0.26 M
MAGUEYES ISLAND PR         18.2N  67.2W       951 AST   2.48 FT/0.76 M
SAN JUAN PR                18.5N  66.1W       1005 AST  1.94 FT/0.59 M
MAYAGUEZ PR                18.2N  67.1W       1008 AST  0.66 FT/0.20 M
AGUADILLA PR               18.4N  67.1W       1027 AST  4.82 FT/1.47 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

A 15.0-FOOT/4.6-METER TSUNAMI IN LIMETREE BAY VI HAS TORN BOARDS
FROM A PIER AND PUSHED THREE BOATS ASHORE. TWO PEOPLE ARE
REPORTED DEAD FROM DROWNING IN CHRISTIANSTED VI AND TWO SEASIDE
HOMES IN LAMESHUR BAY VI HAVE BEEN TORN FROM THE FOUNDATIONS.

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 0900  EDT MAR 23 2011
             0900  AST MAR 23 2011
             0800  CDT MAR 23 2011
             1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

CARIBBEAN COASTAL REGIONS OUTSIDE PUERTO RICO AND THE VIRGIN
ISLANDS SHOULD REFER TO THE PACIFIC TSUNAMI WARNING CENTER MESSAGES
FOR INFORMATION ON THIS EVENT AT WWW.PRH.NOAA.GOV/PR/PTWC.
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THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231531-
/T.CON.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1031 AM AST WED MAR 23 2011

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

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

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

SAN JUAN-PR      0945  AST MAR 23 CHARLOT AMALI-VI 0955  AST MAR 23
MAYAGUEZ-PR      0952  AST MAR 23
FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WCATWC.ARH.NOAA.GOV

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WCATWC Message #5

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WEXX20 PAAQ 231500
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 5
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1100 AM AST WED MAR 23 2011

THIS MESSAGE CONTAINS UPDATED TSUNAMI OBSERVATIONS AND
DAMAGE INFORMATION.

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

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

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES
LOCATION                   LAT    LON         TIME          AMPL
---------------           ----- ------      ------- ---------------
CHRISTIANSTED VI          17.7N  64.7W      906 AST   8.23 FT/2.51 M
LIMETREE BAY VI           17.6N  64.6W      909 AST  15.41 FT/4.70 M
LAMESHUR BAY VI           18.3N  64.7W      918 AST   9.37 FT/2.86 M
VIRGIN GORDA BVI          18.5N  64.5W      919 AST   4.59 FT/1.40 M
CULEBRA PR                18.3N  65.3W      921 AST   6.79 FT/2.07 M
CHARLOTTE AMALIE VI       18.4N  64.9W      945 AST   8.27 FT/2.52 M
MONA ISLAND PR            18.1N  67.9W      948 AST   0.85 FT/0.26 M
MAGUEYES ISLAND PR        18.2N  67.2W      951 AST   2.48 FT/0.76 M
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SAN JUAN PR               18.5N  66.1W      1005 AST  1.94 FT/0.59 M
MAYAGUEZ PR               18.2N  67.1W      1008 AST  0.66 FT/0.20 M
AGUADILLA PR              18.4N  67.1W      1027 AST  4.82 FT/1.47 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

THREE PIERS AND MULTIPLE BOATS ARE REPORTEDLY DAMAGED IN SAN JUAN
PR.  LARGE WAVES CONTINUE TO BE REPORTED IN ALL AFFECTED AREAS
OF PUERTO RICO... U.S. VIRGIN ISLANDS AND BRITISH VIRGIN ISLANDS.

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 0900  EDT MAR 23 2011
             0900  AST MAR 23 2011
             0800  CDT MAR 23 2011
             1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231600-
/T.CON.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1100 AM AST WED MAR 23 2011

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

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

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD
INUNDATION IS IMMINENT OR EXPECTED.  TSUNAMIS ARE A SERIES OF
WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
TIME.

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PTWC Message #3

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WECA41 PHEB 231500
TSUCAX

TSUNAMI MESSAGE NUMBER 3
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1500Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT
PUERTO RICO AND THE VIRGIN ISLANDS.  THE WEST COAST/
ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR
THESE AREAS.

...A REGIONAL TSUNAMI WATCH IS IN EFFECT...
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A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS -
MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT
MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE -
CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA -
HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA -
TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME   - 1300 UTC MAR 23 2011
 LOCATION - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
 DEPTH   - 56 MILES/90 KM

MEASUREMENTS OR REPORTS OF TSUNAMI ACTIVITY

LOCATION	LAT	LON	TIME	AMPL
CHRISTIANSTED VI	17.7N	64.7W	1306Z	8.23 FT/2.51 M
LIMETREE BAY VI	17.6N	64.6W	1309Z	15.41 FT/4.70 M
LAMESHUR BAY VI	18.3N	64.7W	1318Z	9.37 FT/2.86 M
VIRGIN GORDA BVI	18.5N	64.5W	1319Z	4.59 FT/1.40 M
CULEBRA PR	18.3N	65.3W	1321Z	6.79 FT/2.07 M
CHARLOTTE AMALIE VI	18.4N	64.9W	1345Z	8.27 FT/2.52 M
MONA ISLAND PR	18.1N	67.9W	1348Z	0.85 FT/0.26 M
MAGUEYES ISLAND PR	18.2N	67.2W	1351Z	2.48 FT/0.76 M
PUNTA CANA DR	18.5N	68.4W	1357Z	2.35 FT/0.72 M
SANTO DOMINGO DR	18.5N	69.9W	1359Z	1.97 FT/0.60 M
PUERTO PLATA DR	19.8N	70.7W	1402Z	1.68 FT/0.51 M
SAN JUAN PR	18.5N	66.1W	1405Z	1.94 FT/0.59 M
MAYAGUEZ PR	18.2N	67.1W	1408Z	0.66 FT/0.20 M
AGUADILLA PR	18.4N	67.1W	1427Z	4.82 FT/1.47 M
BASSETERRE SAINT KITTS	17.3N	62.7W	1425Z	4.41 FT/1.34 M
PLYMOUTH MONTSERRAT	16.7N	62.2W	1440Z	2.11 FT/0.64 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

REPORTS NOTE THE OIL SLICK FROM THE JERUSALEM AND FIGTREE
HILL TANK FARM IN USVI TO BE SPREADING. THE TANK FARM HAS
REPORTED 23 EMPLOYEES DEAD AND 8 MISSING. RUNUPS IN SAINT JOHN
ANTIGUA ARE REPORTED TO EXCEED 2 METERS. SEVERAL PEOPLE
ARE REPORTED MISSING THERE. THE WEST COAST OF BARBUDA REPORTS TSUNAMI
RUNUPS NEAR 1.5 METER. A NEAR 3 METER RUNUP IN ROSEAU DOMINCA
IS REPORTED TO HAVE SEVERLY FLOODED SECTIONS OF TOWN. RUNUPS
MEASURING APPROXIMATELY 5 METERS ARE REPORTED IN SECTIONS OF GUADELOUPE
WITH LARGE CURRENT AND FLOODING INDUCED DAMAGE. HARBORS IN MARTINIQUE
HAVE EXPERIENCED STRONG SURGES WHICH HAVE PRODUCED DAMAGE TO MANY
STRUCTURES AND BOATS. MINOR INUNDATION HAS BEEN REPORTED SANTO
DOMINGO AND 23 PEOPLE WHO WERE CURIOUS ABOUT THE RECEDING TIDE
AND WALKED OUT TO SEE THE STRANDED SEALIFE ARE REPORTED DEAD.

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

 THE THREAT MAY CONTINUE FOR COASTAL AREAS LOCATED WITHIN ABOUT A
 THOUSAND KILOMETERS OF THE EARTHQUAKE EPICENTER. 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.

 DUE TO ONLY LIMITED SEA LEVEL DATA FROM THE REGION IT IS NOT
 POSSIBLE FOR THIS CENTER TO RAPIDLY NOR ACCURATELY EVALUATE THE
 STRENGTH OF A TSUNAMI IF ONE HAS BEEN GENERATED.
 ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES
 MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME

BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES		ARRIVAL TIME
DOMINICA	ROSEAU	15.3N	61.4W	1404Z MAR23
SAINT MARTIN	BAIE BLANCHE	18.1N	63.0W	1405Z MAR23
BARBUDA	PALMETTO POINT	17.6N	61.9W	1410Z MAR23
MARTINIQUE	FORT-DE-FRANCE	14.6N	61.1W	1411Z MAR23
SAINT LUCIA	CASTRIES	14.0N	61.0W	1412Z MAR23
DOMINICAN REP	PUERTO PLATA	19.8N	70.7W	1413Z MAR23
BONAIRE	ONIMA	12.3N	68.3W	1414Z MAR23
CURACAO	WILLEMSTAD	12.1N	68.9W	1418Z MAR23
TURKS N CAICOS	GRAND TURK	21.5N	71.1W	1418Z MAR23
ST VINCENT	KINGSTOWN	13.1N	61.2W	1419Z MAR23
ANTIGUA	SAINT JOHNS	17.1N	61.9W	1425Z MAR23
GRENADA	SAINT GEORGES	12.0N	61.8W	1428Z MAR23
HAITI	CAP-HAITEN	19.8N	72.2W	1430Z MAR23
ARUBA	ORANJESTAD	12.5N	70.0W	1433Z MAR23
TURKS N CAICOS	WEST CAICOS	21.7N	72.5W	1434Z MAR23
VENEZUELA	MAIQUETIA	10.6N	67.0W	1436Z MAR23
BAHAMAS	MAYAGUANA	22.3N	73.0W	1437Z MAR23
BARBADOS	BRIDGETOWN	13.1N	59.6W	1439Z MAR23
VENEZUELA	CUMANA	10.5N	64.2W	1442Z MAR23
BAHAMAS	GREAT INAGUA	20.9N	73.7W	1444Z MAR23
CUBA	BARACOA	20.4N	74.5W	1448Z MAR23
HAITI	JEREMIE	18.6N	74.1W	1450Z MAR23
TRINIDAD TOBAGO	PIRATES BAY	11.3N	60.6W	1451Z MAR23
BAHAMAS	SAN SALVADOR	24.1N	74.5W	1452Z MAR23
BAHAMAS	CROOKED IS	22.7N	74.1W	1455Z MAR23
CUBA	SANTIAGO D CUBA	19.9N	75.8W	1458Z MAR23
COLOMBIA	SANTA MARTA	11.2N	74.2W	1501Z MAR23
COLOMBIA	RIOHACHA	11.6N	72.9W	1501Z MAR23
COLOMBIA	BARRANQUILLA	11.1N	74.9W	1504Z MAR23
BAHAMAS	ELEUTHERA IS	25.2N	76.1W	1507Z MAR23
CUBA	GIBARA	21.1N	76.1W	1508Z MAR23
JAMAICA	MONTEGO BAY	18.5N	77.9E	1516Z MAR23
COLOMBIA	CARTEGENA	10.4N	75.6W	1516Z MAR23
BAHAMAS	NASSAU	25.1N	77.4W	1519Z MAR23
VENEZUELA	PUNTO FIJO	11.7N	70.2W	1521Z MAR23
JAMAICA	KINGSTON	17.9N	76.9W	1525Z MAR23
BAHAMAS	ABACO IS	26.6N	77.1W	1525Z MAR23
HAITI	PORT-AU-PRINCE	18.5N	72.4W	1527Z MAR23
VENEZUELA	PORLAMAR	10.9N	63.8W	1529Z MAR23
TRINIDAD TOBAGO	PORT-OF-SPAIN	10.6N	61.5W	1541Z MAR23
BAHAMAS	FREEPORT	26.5N	78.8W	1542Z MAR23
CUBA	CIENFUEGOS	22.0N	80.5W	1552Z MAR23
VENEZUELA	GOLFO VENEZUELA	11.4N	71.2W	1554Z MAR23
COLOMBIA	PUNTA CARIBANA	8.6N	76.9W	1600Z MAR23
CUBA	SANTA CRZ D SUR	20.7N	78.0W	1703Z MAR23
CUBA	LA HABANA	23.2N	82.4W	1703Z MAR23
CUBA	NUEVA GERONA	21.9N	82.8W	1806Z MAR23
GUYANA	GEORGETOWN	6.8N	58.2W	1812Z MAR23

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

WCATWC Message #6

WEXX20 PAAQ 231530
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 6
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1130 AM AST WED MAR 23 2011

THIS MESSAGE CONTAINS UPDATED TSUNAMI OBSERVATIONS AND
DAMAGE INFORMATION.

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

...THIS MESSAGE IS INFORMATION ONLY FOR COASTAL AREAS OF
   TEXAS - LOUISIANA - MISSISSIPPI - ALABAMA - FLORIDA -
   GEORGIA - SOUTH CAROLINA - NORTH CAROLINA - VIRGINIA -
   MARYLAND - DELAWARE - NEW JERSEY - NEW YORK - CONNECTICUT -

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   RHODE ISLAND - MASSACHUSETTS - NEW HAMPSHIRE - MAINE - NEW
   BRUNSWICK - NOVA SCOTIA - NEWFOUNDLAND AND LABRADOR FROM
   BROWNSVILLE TEXAS TO CAPE CHIDLEY LABRADOR...

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES
LOCATION                   LAT    LON         TIME          AMPL
---------------           ----- ------      ------- ---------------
CHARLOTTE AMALIE VI       18.4N  64.9W      945 AST  8.27 FT/2.52 M
MONA ISLAND PR            18.1N  67.9W      948 AST  0.85 FT/0.26 M
MAGUEYES ISLAND PR        18.2N  67.2W      951 AST  2.48 FT/0.76 M
SAN JUAN PR               18.5N  66.1W     1005 AST 1.94 FT/0.59 M
MAYAGUEZ PR               18.2N  67.1W     1008 AST 0.66 FT/0.20 M
AGUADILLA PR              18.4N  67.1W     1027 AST 4.82 FT/1.47 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

A WITNESS REPORTED THAT FOUR PEOPLE WATCHING THE TIDE SUDDENLY
RECEDE ON MAGUEYES ISLAND PR WERE SWEPTED OUT TO SEA WHEN THE SURGE
OF WATER CAME BACK TOWARDS LAND.  THE WITNESS WAS SAFELY WATCHING
THE VICTIMS FROM A NEARBY HILL.

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 0900  EDT MAR 23 2011
             0900  AST MAR 23 2011
             0800  CDT MAR 23 2011
             1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231630-
/T.CON.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1130 AM AST WED MAR 23 2011

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

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

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD
INUNDATION IS IMMINENT OR EXPECTED.  TSUNAMIS ARE A SERIES OF
WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
TIME.
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WCATWC Message #7

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WEXX20 PAAQ 231601
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 7
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1201 PM AST WED MAR 23 2011

THIS MESSAGE DOWNGRADES THE WARNING TO AN ADVISORY FOR
PUERTO RICO AND THE VIRGIN ISLANDS.

... A TSUNAMI ADVISORY IS NOW IN EFFECT FOR PUERTO RICO AND
   THE VIRGIN ISLANDS...

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

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES
LOCATION                    LAT    LON         TIME          AMPL
---------------            ----- ------      ------- ---------------
SAN JUAN PR                18.5N  66.1W       1005 AST  1.94 FT/0.59 M
MAYAGUEZ PR                18.2N  67.1W       1008 AST  0.66 FT/0.20 M
AGUADILLA PR               18.4N  67.1W       1027 AST  4.82 FT/1.47 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

TSUNAMI HEIGHTS THROUGHOUT PUERTO RICO ARE DECREASING IN SIZE.  150
PEOPLE HAVE REPORTEDLY BEEN KILLED BY THE TSUNAMI IN PUERTO RICO...
U.S. VIRGIN ISLANDS... AND BRITISH VIRGIN ISLANDS.

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 0900  EDT MAR 23 2011
             0900  AST MAR 23 2011
             0800  CDT MAR 23 2011
             1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.
THIS MESSAGE WILL BE UPDATED IN 30 MINUTES OR SOONER IF
THE SITUATION WARRANTS. THE TSUNAMI ADVISORY WILL REMAIN IN EFFECT
UNTIL FURTHER NOTICE. REFER TO THE INTERNET SITE
WCATWC.ARH.NOAA.GOV FOR MORE INFORMATION.

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231701-
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/T.CAN.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
/T.NEW.PAAQ.TS.Y.0003.110323T1601Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1201 PM AST WED MAR 23 2011

... A TSUNAMI ADVISORY IS NOW IN EFFECT FOR PUERTO RICO AND
   THE VIRGIN ISLANDS...

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

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

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PTWC Message #4

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WECA41 PHEB 231601
TSUCAX

TSUNAMI MESSAGE NUMBER 4
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1601Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT
PUERTO RICO AND THE VIRGIN ISLANDS.  THE WEST COAST/
ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR
THESE AREAS.

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

A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS -
MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT
MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE -
CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA -
HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA -
TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

MEASUREMENTS OR REPORTS OF TSUNAMI ACTIVITY
LOCATION                   LAT    LON         TIME          AMPL
---------------            ----- ------      ------- ---------------
SAN JUAN PR               18.5N  66.1W        1405Z   1.94 FT/0.59 M
MAYAGUEZ PR               18.2N  67.1W        1408Z   0.66 FT/0.20 M
AGUADILLA PR              18.4N  67.1W        1427Z   4.82 FT/1.47 M
PUNTA CANA DR             18.5N  68.4W        1357Z    2.35 FT/0.72 M
SANTO DOMINGO DR          18.5N  69.9W        1359Z    1.97 FT/0.60 M
PUERTO PLATA DR           19.8N  70.7W        1402Z    1.68 FT/0.51 M
BASSETERRE SAINT KITTS     17.3N  62.7W        1425Z   4.41 FT/1.34 M
PLYMOUTH MONTSERRAT        16.7N  62.2W        1440Z   2.11 FT/0.64 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

THE LARGE INUNDATION ALONG THE GUADELOUPE COAST HAS REPORTEDLY KILLED
75 PEOPLE. TSUNAMI RUNUP IN SAINT GEORGE GRENADA IS REPORTED TO BE
NEAR 2 METERS.  MINOR FLOODING OF THE WATERFRONT HAS BEEN REPORTED WITH
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LARGE AMOUNTS OF DAMAGE TO BOATS AND HARBOR FACILITIES. MUCH OF THE OIL SLICK NEAR LIMETREE BAY VI IS REPORTED TO BE ON FIRE. THIS FIRE HAS SPREAD SHOREWARD TO THE VEGETATION AND THE 25-KT SOUTHEAST WIND CONTINUES TO FAN IT INLAND. CHRISTIANSTED VI NOW REPORTS 120 DEAD AND AN ESTIMATED $63M USD IN DAMAGE. SAINT VINCENT REPORTS A WAVE APPROXIMATELY 1 METER IN HEIGHT COMING INTO THE SHORE. THE SAINT VINCENT NATIONAL CONTACT REPORTS THE MOORINGS FROM TWO VESSELS BROKE DUE TO TENSION. THREE SAILORS DIED FROM THE RECOIL OF THE MOORING LINES. EXTENSIVE DAMAGE WAS REPORTEDLY DONE TO A CRUISE SHIP AT SAINT VINCENT WHEN A GANGWAY COLLAPSED AFTER THE SHIP WAS SUDDENLY LIFTED BY THE 1 METER WAVE. THE SHIP'S GANGWAY COLLAPSED CAUSING THREE PASSENGERS TO FALL INTO THE WATER. ONE OF THE PASSENGERS IS REPORTED DEAD. STRONG CURRENTS ALONG SHORES OF CURACAO AND ARUBA HAVE BEEN REPORTED TO CAUSE DAMAGE TO SEVERAL SHIPS.

EVALUATION

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

THE THREAT MAY CONTINUE FOR COASTAL AREAS LOCATED WITHIN ABOUT A THOUSAND KILOMETERS OF THE EARTHQUAKE EPICENTER. 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.

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

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES		ARRIVAL TIME
COLOMBIA	BARRANQUILLA	11.1N	74.9W	1504Z MAR23
BAHAMAS	ELEUTHERA IS	25.2N	76.1W	1507Z MAR23
CUBA	GIBARA	21.1N	76.1W	1508Z MAR23
JAMAICA	MONTEGO BAY	18.5N	77.9W	1516Z MAR23
COLOMBIA	CARTEGENA	10.4N	75.6W	1516Z MAR23
BAHAMAS	NASSAU	25.1N	77.4W	1519Z MAR23
VENEZUELA	PUNTO FIJO	11.7N	70.2W	1521Z MAR23
JAMAICA	KINGSTON	17.9N	76.9W	1525Z MAR23
BAHAMAS	ABACO IS	26.6N	77.1W	1525Z MAR23
HAITI	PORT-AU-PRINCE	18.5N	72.4W	1527Z MAR23
VENEZUELA	PORLAMAR	10.9N	63.8W	1529Z MAR23
TRINIDAD TOBAGO	PORT-OF-SPAIN	10.6N	61.5W	1541Z MAR23
BAHAMAS	FREEPORT	26.5N	78.8W	1542Z MAR23
CUBA	CIENFUEGOS	22.0N	80.5W	1552Z MAR23
VENEZUELA	GOLFO VENEZUELA	11.4N	71.2W	1554Z MAR23
COLOMBIA	PUNTA CARIBANA	8.6N	76.9W	1600Z MAR23
CUBA	SANTA CRZ D SUR	20.7N	78.0W	1703Z MAR23
CUBA	LA HABANA	23.2N	82.4W	1703Z MAR23
CUBA	NUEVA GERONA	21.9N	82.8W	1806Z MAR23
GUYANA	GEORGETOWN	6.8N	58.2W	1812Z MAR23

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

WCATWC Message #8

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WEXX20 PAAQ 231630
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 8
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1230 PM AST WED MAR 23 2011

THIS MESSAGE CONTAINS NEW INFORMATION ON TSUNAMI OBSERVATIONS
AND CASUALTIES.

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

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

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES

LOCATION                    LAT    LON         TIME          AMPL
--------------             ----- ------      ------- ---------------
AGUADILLA PR               18.4N  67.1W      1027 AST  4.82 FT/1.47 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

TSUNAMI HEIGHTS THROUGHOUT PUERTO RICO CONTINUE TO DECREASE IN SIZE.
150 PEOPLE HAVE REPORTEDLY BEEN KILLED BY THE TSUNAMI IN PUERTO RICO...
U.S. VIRGIN ISLANDS... AND BRITISH VIRGIN ISLANDS.  ANOTHER 75 ARE
REPORTED DROWNED IN GUADELOUPE.

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 0900  EDT MAR 23 2011
             0900  AST MAR 23 2011
             0800  CDT MAR 23 2011
             1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
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VIZ001-002-231730-
/T.CON.PAAQ.TS.A.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1230 PM AST WED MAR 23 2011

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

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

TSUNAMI ADVISORIES MEAN THAT A TSUNAMI CAPABLE OF PRODUCING
STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR
WATER IS IMMINENT OR EXPECTED. SIGNIFICANT WIDESPREAD INUNDATION
IS NOT EXPECTED FOR AREAS IN AN ADVISORY. TSUNAMIS ARE A SERIES OF
WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL
TIME.
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WCATWC Message #9

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WEXX20 PAAQ 231701
TSUAT1

BULLETIN
TSUNAMI MESSAGE NUMBER 9
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
101 PM AST WED MAR 23 2011

...THE TSUNAMI ADVISORY IS CANCELED FOR PUERTO RICO AND THE
   VIRGIN ISLANDS...

EVALUATION
 DAMAGING TSUNAMIS ARE NO LONGER EXPECTED ALONG THE
 COASTS PUERTO RICO AND THE VIRGIN ISLANDS.
 AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI WAVE
 ACTION THE ALL CLEAR DETERMINATIONS MUST BE MADE BY LOCAL AUTHORITIES.

 TSUNAMI AMPLITUDES HAVE DROPPED BELOW DANGEROUS LEVELS AT MOST
 LOCATIONS ALONG THE COASTS OF PUERTO RICO
 AND THE VIRGIN ISLANDS. SEA LEVEL CONDITIONS STILL VARY GREATLY FROM
 LOCATION TO LOCATION ALONG THE COAST. DECISIONS RELATING TO REOCCUPATION OF
 COASTAL ZONES MUST BE MADE BY LOCAL AUTHORITIES.

WAVES THROUGHOUT THE PUERTO RICO AND THE VIRGIN ISLANDS ARE ALL PRESENTLY BELOW 0.5
METERS IN HEIGHT.  THE DEATH TOLL HAS NOW CLIMBED TO 500 PEOPLE TOTAL FOR PUERTO
RICO... THE VIRGIN ISLANDS AND GUADELOUPE.  DAMAGE TO COASTAL STRUCTURES THROUGHOUT
THESE ISLANDS IS EXTENSIVE... INCLUDING RESORTS AND CRUISE SHIPS.

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 0900  EDT MAR 23 2011
             0900  AST MAR 23 2011
             0800  CDT MAR 23 2011
             1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

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

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231901-
/T.CAN.PAAQ.TS.Y.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
101 PM AST WED MAR 23 2011

...THE TSUNAMI ADVISORY IS CANCELED FOR PUERTO RICO AND THE
   VIRGIN ISLANDS...

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PTWC Message #5

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WECA41 PHEB 231701
TSUCAX

TSUNAMI MESSAGE NUMBER 5
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1702Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT
PUERTO RICO AND THE VIRGIN ISLANDS.  THE WEST COAST/
ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR
THESE AREAS.

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

A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS -
MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT
MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE -
CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA -
HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA -
TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

MEASUREMENTS OR REPORTS OF TSUNAMI ACTIVITY
LOCATION                   LAT    LON         TIME          AMPL
---------------           ----- ------      ------- ---------------
CHRISTIANSTED VI          17.7N  64.7W        1306Z   8.23 FT/2.51 M
LIMETREE BAY VI           17.6N  64.6W        1309Z  15.41 FT/4.70 M
LAMESHUR BAY VI           18.3N  64.7W        1318Z   9.37 FT/2.86 M
VIRGIN GORDA BVI          18.5N  64.5W        1319Z   4.59 FT/1.40 M
CULEBRA PR                18.3N  65.3W        1321Z   6.79 FT/2.07 M
CHARLOTTE AMALIE VI       18.4N  64.9W        1345Z   8.27 FT/2.52 M
MONA ISLAND PR            18.1N  67.9W        1348Z   0.85 FT/0.26 M
MAGUEYES ISLAND PR        18.2N  67.2W        1351Z   2.48 FT/0.76 M
SAN JUAN PR               18.5N  66.1W        1405Z   1.94 FT/0.59 M
MAYAGUEZ PR               18.2N  67.1W        1408Z   0.66 FT/0.20 M
AGUADILLA PR              18.4N  67.1W        1427Z   4.82 FT/1.47 M
PUNTA CANA DR             18.5N  68.4W        1357Z    2.35 FT/0.72 M
SANTO DOMINGO DR          18.5N  69.9W        1359Z    1.97 FT/0.60 M
PUERTO PLATA DR           19.8N  70.7W        1402Z    1.68 FT/0.51 M
BASSETERRE SAINT KITTS     17.3N  62.7W        1425Z   4.41 FT/1.34 M
PLYMOUTH MONTSERRAT        16.7N  62.2W        1440Z   2.11 FT/0.64 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
       IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
       VALUES ARE GIVEN IN BOTH METERS(M) AND FEET(FT).

STRONG CURRENTS INDUCED BY APPROXIMATELY 1 METER AMPLITUDE WAVES
IN SAINT LUCIA REPORTED HAVE DESTROYED MOORINGS AND DOCKS IN
THE REGION. BASSETERRE ST. KITTS REPORTS A 4+ FOOT WAVE THAT HAS
INUNDATED ITS SHORELINE AS FAR INLAND AS CANYON STREET.  A DOCKED
FERRY WAS TORN FROM ITS MOORINGS IN BASSETERRE BAY AND WAS CARRIED
INLAND TO THE BUS TERMINAL LOCATED NEAR THE DOCK.  THE VANCE W.
AMORY INTERNATIONAL AIRPORT AT PLYMOUTH MONTSERRAT REPORTS FLOODING
ON THE RUNWAY AND HAS TEMPORARILY SHUTDOWN FLIGHT OPERATIONS.


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

 THE THREAT MAY CONTINUE FOR COASTAL AREAS LOCATED WITHIN ABOUT A
 THOUSAND KILOMETERS OF THE EARTHQUAKE EPICENTER. 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.

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

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

PTWC Message #6

```
WECA41 PHEB 231802
TSUCAX

TSUNAMI MESSAGE NUMBER 6
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1802Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT
PUERTO RICO AND THE VIRGIN ISLANDS.  THE WEST COAST/
ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR
THESE AREAS.

... 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

PRELIMINARY EARTHQUAKE PARAMETERS
 MAGNITUDE - 7.6
 TIME      - 1300  UTC MAR 23 2011
 LOCATION  - 18.2 NORTH 65.3 WEST
             25 MILES/40 KM SE OF FAJARDO PUERTO RICO
             55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
 DEPTH     - 56 MILES/90 KM

500 PEOPLE HAVE BEEN REPORTED DEAD DUE TO THIS EVENT AND
NUMEROUS REPORTED MISSING.  DAMAGE CAUSED BY THE FIRE IN LIMETREE
BAY, VI AND THE TSUNAMI'S INUNDATION IN THE CARIBBEAN IS ESTIMATED
TO BE MORE THAN $350M USD THUS FAR.  THE FIRE AND OIL SLICK AT
LIMETREE BAY VI HAS BEEN CONTAINED BUT INLAND FIRES WEST OF
LIMETREE BAY CONTINUE TO BE FAUGHT.  STRONG CURRENTS ARE ONGOING
IN HARBORS THROUGHOUT THE EASTERN CARIBBEAN REGION.
SIGNIFICANT FLOODING HAS CEASED HOWEVER DANGER IN THE
WATER PERSISTS. FOOD AND PERSONNEL AID IS CURRENTLY BEING
FLOWN FROM NAVAL AIR STATION KEY WEST TO SEVERAL COMMUNITIES THROUGHOUT THE
CARIBBEAN.

EVALUATION
 A DAMAGING TSUNAMI WAS OBSERVED IN THE NE CARIBBEAN SEA. MANY
 REPORTS OF DAMAGE HAVE BEEN RECEIVED BY THE CENTER.  SEA LEVEL
 GAGES AND FORECAST MODELS INDICATE THAT THREAT LEVELS IN AFFECTED
 REGIONS SHOULD NOW AT LOW LEVELS.

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

Appendix V. Web-based Products

Graphical and web-based products are posted to the TWC web sites during an event. This Appendix contains examples of several. The first is the html-based text message with embedded links.

To: U.S. and Canadian Atlantic, and Gulf of Mexico coastal regions
From: NOAA/NWS/West Coast and Alaska Tsunami Warning Center
Subject: Tsunami Warning #1 issued 3/23/2011 at 9:02AM AST

A Tsunami Warning **is now in effect for Puerto Rico and the Virgin Islands.**

This message is for **Information Only** for coastal areas of Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, North Carolina, Virginia, Maryland, Delaware, New Jersey, New York, Connecticut, Rhode Island, Massachusetts, New Hampshire, Maine, New Brunswick, Nova Scotia, Newfoundland and Labrador from Brownsville, Texas to Cape Chidley, Labrador.

A **Tsunami Warning** means that all coastal residents in the warning area who are near the beach or in low-lying regions should move immediately inland to higher ground and away from all harbors and inlets including those sheltered directly from the sea. Those feeling the earth shake, seeing unusual wave action, or the water level rising or receding may have only a few minutes before the tsunami arrival and should move immediately. Homes and small buildings are not designed to withstand tsunami impacts. Do not stay in these structures.

All residents within the warned area should be alert for instructions broadcast from their local civil authorities. This tsunami warning is based solely on earthquake information - the tsunami has not yet been confirmed.

At 9:00 AM Atlantic Standard Time on March 23, an earthquake with preliminary magnitude 7.6 occurred 25 miles/40 Km southeast of Fajardo, Puerto Rico . (Refer to the United States Geological Survey for official earthquake parameters.) This earthquake **may have** generated a tsunami. If a tsunami has been generated, the waves will first reach Christiansted, USVI at 9:11 AM AST on March 23. Estimated tsunami arrival times and maps along with safety rules and other information can be found on the WCATWC web site.

Tsunamis can be dangerous waves that are not survivable. Wave heights are amplified by irregular shoreline and are difficult to forecast. Tsunamis often appear as a strong surge and may be preceded by a receding water level. Mariners in water deeper than 600 feet should not be affected by a tsunami. Wave heights will increase rapidly as water shallows. Tsunamis are a series of ocean waves which can be dangerous for several hours after the initial wave arrival. DO NOT return to evacuated areas until an all clear is given by local civil authorities.

Caribbean coastal regions outside Puerto Rico and the Virgin Islands should refer to the Pacific Tsunami Warning Center messages for information on the event.

This message will be updated in 30 minutes or sooner if the situation warrants. The tsunami warning will remain in effect until further notice. For further information stay tuned to NOAA Weather Radio, your local TV or radio stations, or see the WCATWC web site.

Link to Standard Warning Message
Link to Public Warning Message
Link to XML/CAP Message
Link to Printable Message

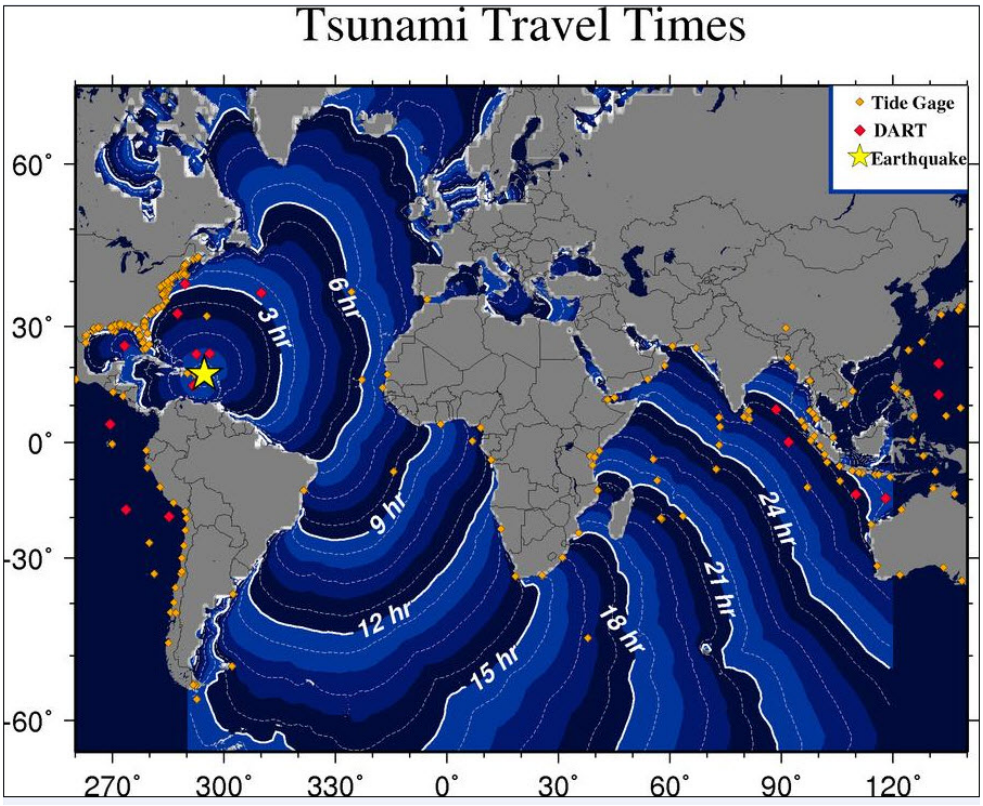

Figure V-1. Example of a travel time map that would be issued with event.

Tsunami travel time list example below.

The following list gives estimated times of arrival for locations along the U.S. and Canadian Atlantic coast from a tsunami generated at the given source location. The list is ordered chronologically. Since tsunami speed is directly related to water depth, tsunami ETAs can be computed independent of tsunami amplitude. THE LISTING OF A TSUNAMI ARRIVAL TIME BELOW DOES NOT INDICATE A WAVE IS IMMINENT. 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.

Source:
Lat: 18.2N
Lng: 65.3W
Mag: 7.6
O-time: 1300UTC
Date: MAR 23

Estimated times of initial tsunami arrival:

Christiansted, U.S. Virgin Is	0911 AST MAR 23	1311 UTC MAR 23
Vieques Is., Puerto Rico	0911 AST MAR 23	1311 UTC MAR 23
Limetree Bay, U.S. Virgin Is.	0919 AST MAR 23	1319 UTC MAR 23
Lameshur Bay, U.S. Virgin Islands	0921 AST MAR 23	1321 UTC MAR 23
Culebra, Puerto Rico	0922 AST MAR 23	1322 UTC MAR 23
Mona Island, Puerto Rico	0937 AST MAR 23	1337 UTC MAR 23
Virgin Gorda, British Virgin Islands	0939 EDT MAR 23	1339 UTC MAR 23
Magueyes Island, Puerto Rico	0941 AST MAR 23	1341 UTC MAR 23
San Juan, Puerto Rico	0945 AST MAR 23	1345 UTC MAR 23
Aguadilla, Puerto Rico	0948 AST MAR 23	1348 UTC MAR 23
Mayaguez, Puerto Rico	0952 AST MAR 23	1352 UTC MAR 23
Charlotte Amalie, U.S. Virgin Is	0955 AST MAR 23	1355 UTC MAR 23

DART 41421	0959 EDT MAR 23	1359 UTC MAR 23
DART 41420	1004 EDT MAR 23	1404 UTC MAR 23
Samana Cay, Bahamas	1039 EDT MAR 23	1439 UTC MAR 23
Guantanamo Bay, Cuba	1055 EDT MAR 23	1455 UTC MAR 23
Bermuda	1121 EDT MAR 23	1521 UTC MAR 23
DART 41424	1128 EDT MAR 23	1528 UTC MAR 23
Settlement Point, Bahamas	1150 EDT MAR 23	1550 UTC MAR 23
Virginia Key, Florida	1217 EDT MAR 23	1617 UTC MAR 23
DART 44401	1218 EDT MAR 23	1618 UTC MAR 23
Jupiter Inlet, Florida	1220 EDT MAR 23	1620 UTC MAR 23
DART 44402	1223 EDT MAR 23	1623 UTC MAR 23
Ocean Reef, Florida	1229 EDT MAR 23	1629 UTC MAR 23
Miami, Florida	1233 EDT MAR 23	1633 UTC MAR 23
Cape Hatteras, North Carolina	1234 EDT MAR 23	1634 UTC MAR 23
Cancun, Mexico	1141 CDT MAR 23	1641 UTC MAR 23
Oregon Inlet, North Carolina	1258 EDT MAR 23	1658 UTC MAR 23
Key West, Florida	1315 EDT MAR 23	1715 UTC MAR 23
Beaufort, North Carolina	1320 EDT MAR 23	1720 UTC MAR 23
Vaca Key, Florida	1322 EDT MAR 23	1722 UTC MAR 23
Duck, North Carolina	1329 EDT MAR 23	1729 UTC MAR 23
Port Canaveral, Florida	1329 EDT MAR 23	1729 UTC MAR 23
DART 42409	1330 EDT MAR 23	1730 UTC MAR 23
Currituck Beach Lighthouse, North Carolina	1334 EDT MAR 23	1734 UTC MAR 23
Ocean City, Maryland	1347 EDT MAR 23	1747 UTC MAR 23
Melbourne, Florida	1347 EDT MAR 23	1747 UTC MAR 23
Lockeport, Nova Scotia	1453 ADT MAR 23	1753 UTC MAR 23
Surf City, North Carolina	1356 EDT MAR 23	1756 UTC MAR 23
Wrightsville Beach, North Carolina	1356 EDT MAR 23	1756 UTC MAR 23
Pilots Station East, Louisiana	1301 CDT MAR 23	1801 UTC MAR 23
Montauk Point, New York	1404 EDT MAR 23	1804 UTC MAR 23
South Santee River, South Carolina	1405 EDT MAR 23	1805 UTC MAR 23
Virginia Beach, Virginia	1408 EDT MAR 23	1808 UTC MAR 23
Flagler Beach, Florida	1413 EDT MAR 23	1813 UTC MAR 23
Cape Henlopen, Delaware	1414 EDT MAR 23	1814 UTC MAR 23
Atlantic City, New Jersey	1414 EDT MAR 23	1814 UTC MAR 23
Fire Island Light, New York	1415 EDT MAR 23	1815 UTC MAR 23
Watch Hill, Rhode Island	1417 EDT MAR 23	1817 UTC MAR 23
Lewes, Delaware	1417 EDT MAR 23	1817 UTC MAR 23
Jacksonville Beach, Florida	1421 EDT MAR 23	1821 UTC MAR 23
Chesapeake Bridge, Virginia	1427 EDT MAR 23	1827 UTC MAR 23
Newport, Rhode Island	1428 EDT MAR 23	1828 UTC MAR 23
Woods Hole, Massachusetts	1429 EDT MAR 23	1829 UTC MAR 23
Myrtle Beach, South Carolina	1432 EDT MAR 23	1832 UTC MAR 23
Charlesville, Nova Scotia	1534 ADT MAR 23	1834 UTC MAR 23
Springmaid Pier, South Carolina	1434 EDT MAR 23	1834 UTC MAR 23
Sandy Hook, New Jersey	1436 EDT MAR 23	1836 UTC MAR 23
Chezzetcook, Nova Scotia	1538 ADT MAR 23	1838 UTC MAR 23
New London, Connecticut	1439 EDT MAR 23	1839 UTC MAR 23
Port Aux Basque, Newfoundland	1609 NDT MAR 23	1839 UTC MAR 23
Nantucket Island, Massachusetts	1440 EDT MAR 23	1840 UTC MAR 23
Yarmouth, Nova Scotia	1540 ADT MAR 23	1840 UTC MAR 23
Halifax, Nova Scotia	1540 ADT MAR 23	1840 UTC MAR 23
Charleston, South Carolina	1441 EDT MAR 23	1841 UTC MAR 23
Fernandina Beach, Florida	1441 EDT MAR 23	1841 UTC MAR 23
Cape Ray, Newfoundland	1613 NDT MAR 23	1843 UTC MAR 23
Savannah, Georgia	1443 EDT MAR 23	1843 UTC MAR 23
Scatarie Island, Nova Scotia	1544 ADT MAR 23	1844 UTC MAR 23
Cape May, New Jersey	1444 EDT MAR 23	1844 UTC MAR 23
St Lawrence, Newfoundland	1615 NDT MAR 23	1845 UTC MAR 23
Flamingo, Florida	1446 EDT MAR 23	1846 UTC MAR 23
Kiptopeke, Virginia	1450 EDT MAR 23	1850 UTC MAR 23
Cutler NAS, Maine	1452 EDT MAR 23	1852 UTC MAR 23

Saint Pierre/Miquelon	1622 NDT MAR 23	1852 UTC MAR 23
Grand Isle, Louisiana	1354 CDT MAR 23	1854 UTC MAR 23
Money Point, Virginia	1456 EDT MAR 23	1856 UTC MAR 23
Meat Cove, Nova Scotia	1557 ADT MAR 23	1857 UTC MAR 23
Altamaha Sound, Georgia	1459 EDT MAR 23	1859 UTC MAR 23
Quonset Point, Rhode Island	1500 EDT MAR 23	1900 UTC MAR 23
Destin, Florida	1403 CDT MAR 23	1903 UTC MAR 23
Argentia, Newfoundland	1634 NDT MAR 23	1904 UTC MAR 23
St. Simons Is., Georgia	1506 EDT MAR 23	1906 UTC MAR 23
Bar Harbor, Maine	1507 EDT MAR 23	1907 UTC MAR 23
Grand Manan Is., New Brunswick	1608 ADT MAR 23	1908 UTC MAR 23
Windmill Point, Virginia	1509 EDT MAR 23	1909 UTC MAR 23
the U.S.-Canada border	1511 EDT MAR 23	1911 UTC MAR 23
North Sydney, Nova Scotia	1612 ADT MAR 23	1912 UTC MAR 23
Port Fourchon, Louisiana	1413 CDT MAR 23	1913 UTC MAR 23
Alvarado, Mexico	1416 CDT MAR 23	1916 UTC MAR 23
Panama City, Florida	1417 CDT MAR 23	1917 UTC MAR 23
New Point Comfort, Virginia	1519 EDT MAR 23	1919 UTC MAR 23
La Manche, Newfoundland	1649 NDT MAR 23	1919 UTC MAR 23
Fort Point, New Hampshire	1523 EDT MAR 23	1923 UTC MAR 23
Stonington, Maine	1525 EDT MAR 23	1925 UTC MAR 23
Merrimack River, Massachusetts	1527 EDT MAR 23	1927 UTC MAR 23
Manhattan, New York	1530 EDT MAR 23	1930 UTC MAR 23
Saint John, New Brunswick	1631 ADT MAR 23	1931 UTC MAR 23
Tampico, Mexico	1431 CDT MAR 23	1931 UTC MAR 23
Brownsville, Texas	1433 CDT MAR 23	1933 UTC MAR 23
Ship John Shoal, New Jersey	1534 EDT MAR 23	1934 UTC MAR 23
Bergen Point, New Jersey	1535 EDT MAR 23	1935 UTC MAR 23
New Haven, Connecticut	1537 EDT MAR 23	1937 UTC MAR 23
Saint Johns, Newfoundland	1708 NDT MAR 23	1938 UTC MAR 23
Portland, Maine	1541 EDT MAR 23	1941 UTC MAR 23
Apalachicola, Florida	1442 CDT MAR 23	1942 UTC MAR 23
Port Isabel, Texas	1447 CDT MAR 23	1947 UTC MAR 23
Yorktown, Virginia	1552 EDT MAR 23	1952 UTC MAR 23
Corpus Christi, Texas	1454 CDT MAR 23	1954 UTC MAR 23
the Mississippi-Alabama border	1457 CDT MAR 23	1957 UTC MAR 23
Bridgeport, Connecticut	1600 EDT MAR 23	2000 UTC MAR 23
Lewisetta, Virginia	1601 EDT MAR 23	2001 UTC MAR 23
Boston, Massachusetts	1601 EDT MAR 23	2001 UTC MAR 23
Baffin Bay, Texas	1506 CDT MAR 23	2006 UTC MAR 23
Clearwater Beach, Florida	1607 EDT MAR 23	2007 UTC MAR 23
Providence, Rhode Island	1619 EDT MAR 23	2019 UTC MAR 23
Bonavista, Newfoundland	1753 NDT MAR 23	2023 UTC MAR 23
Port O'connor, Texas	1530 CDT MAR 23	2030 UTC MAR 23
Harrington Harbour, Quebec	1732 ADT MAR 23	2032 UTC MAR 23
Rock Port, Texas	1533 CDT MAR 23	2033 UTC MAR 23
Waveland, Mississippi	1534 CDT MAR 23	2034 UTC MAR 23
Freeport, Texas	1535 CDT MAR 23	2035 UTC MAR 23
Pointe Saint Pierre, Quebec	1738 ADT MAR 23	2038 UTC MAR 23
Battle Harbour, Labrador	1815 NDT MAR 23	2045 UTC MAR 23
Kings Point, New York	1655 EDT MAR 23	2055 UTC MAR 23
Naples, Florida	1657 EDT MAR 23	2057 UTC MAR 23
Holton Harbour, Newfoundland	1833 NDT MAR 23	2103 UTC MAR 23
Champoton, Mexico	1605 CDT MAR 23	2105 UTC MAR 23
Port Manatee, Florida	1706 EDT MAR 23	2106 UTC MAR 23
Bonita Beach, Florida	1709 EDT MAR 23	2109 UTC MAR 23
Galveston, Texas	1610 CDT MAR 23	2110 UTC MAR 23
Fort Myers, Florida	1712 EDT MAR 23	2112 UTC MAR 23
St. Petersburg, Florida	1712 EDT MAR 23	2112 UTC MAR 23
Biloxi, Mississippi	1614 CDT MAR 23	2114 UTC MAR 23
Suwannee River, Florida	1717 EDT MAR 23	2117 UTC MAR 23
Eugene Is., Louisiana	1618 CDT MAR 23	2118 UTC MAR 23

Boat Harbour, Newfoundland	1850 NDT MAR 23	2120 UTC MAR 23
Morgan City, Louisiana	1630 CDT MAR 23	2130 UTC MAR 23
Lanse au Clair, Newfoundland	1904 NDT MAR 23	2134 UTC MAR 23
Wood Islands, Prince Edward Is.	1835 ADT MAR 23	2135 UTC MAR 23
Sept Iles, Quebec	1836 ADT MAR 23	2136 UTC MAR 23
Cape Chidley, Labrador	1742 AST MAR 23	2142 UTC MAR 23
Nuuk, Greenland	1751 EDT MAR 23	2151 UTC MAR 23
Cedar Key, Florida	1754 EDT MAR 23	2154 UTC MAR 23
Sabine Pass, Texas	1655 CDT MAR 23	2155 UTC MAR 23
High Island, Texas	1656 CDT MAR 23	2156 UTC MAR 23
Hebron, Newfoundland	1906 ADT MAR 23	2206 UTC MAR 23
Escuminac, New Brunswick	1913 ADT MAR 23	2213 UTC MAR 23
Charlottetown, Prince Edward Is.	1918 ADT MAR 23	2218 UTC MAR 23
Nain, Newfoundland	1920 ADT MAR 23	2220 UTC MAR 23
Brevoort Harbour, Nunavut	1821 EDT MAR 23	2221 UTC MAR 23
Belledune, New Brunswick	1922 ADT MAR 23	2222 UTC MAR 23
Cape Dyer, Nunavut	1831 EDT MAR 23	2231 UTC MAR 23
Shediac, New Brunswick	2030 ADT MAR 23	2330 UTC MAR 23
Clyde River, Nunavut	1954 EDT MAR 23	2354 UTC MAR 23
Thule AFB, Greenland	2101 EDT MAR 23	0101 UTC MAR 24
Dundas Harbor, Nunavut	2110 EDT MAR 23	0110 UTC MAR 24

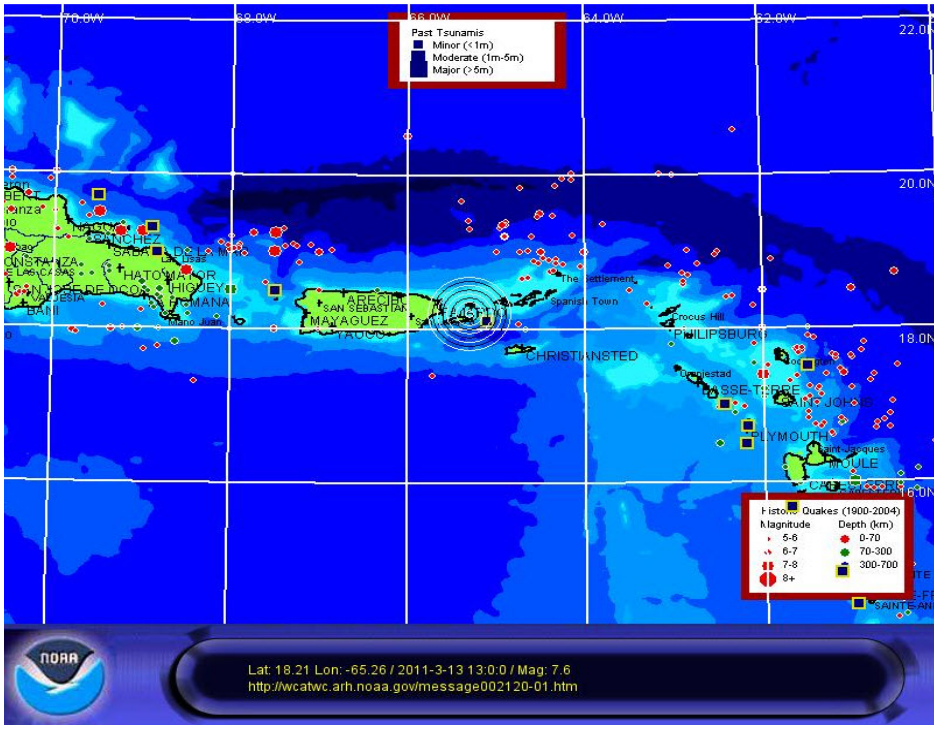

Figure V-2. Example of large scale map that would be issued with bulletin 1.

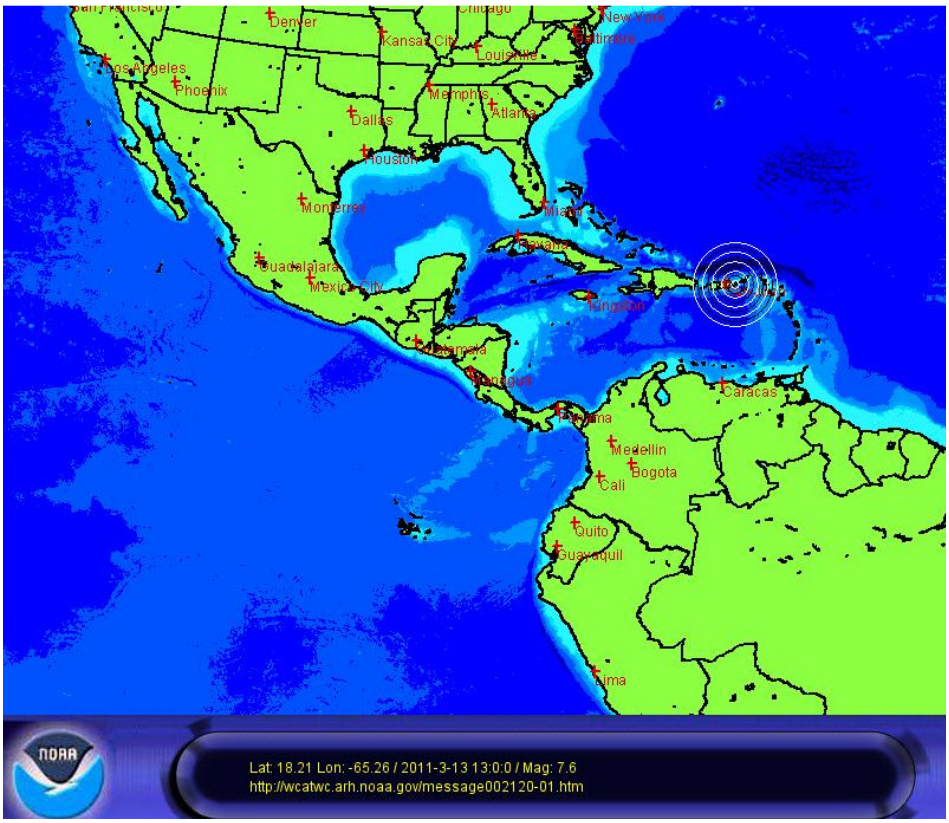

Figure V-3. Example of a source zone map issued with bulletin 1

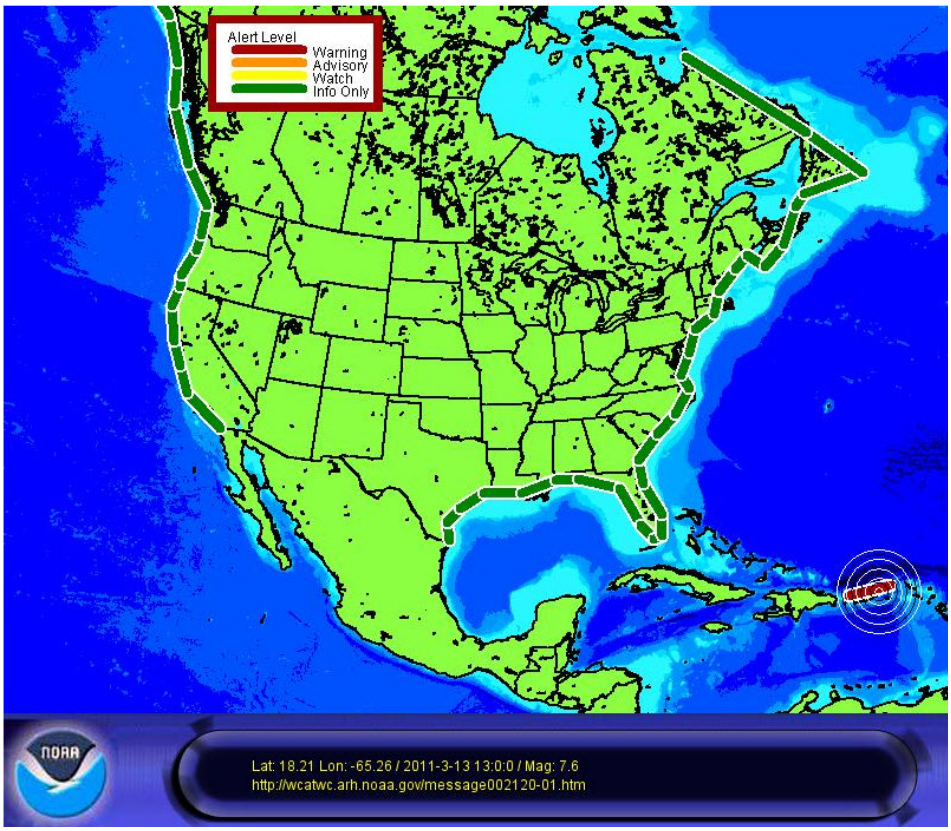

Figure V-4. Example of an warning zones map issued with bulletin 1

Appendix VI. 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)

CARIBBEAN TSUNAMI EXERCISE TO BE CONDUCTED March 23, 2011

(*insert community/county/state name*) will join other localities in the Caribbean as a participant in a tsunami response exercise on March 23, 2011. 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 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 11/LANTEX 11, will simulate a widespread Tsunami Warning and Watch situation throughout the Caribbean which requires implementation of local tsunami response plans. It is the first 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 25 miles southeast of Fajardo, Puerto Rico and 55 miles southeast of San Juan, Puerto Rico at 9:00am Atlantic Standard Time (*or appropriate local time*) on March 23, 2011. 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/

###

On the Web:

West Coast/Alaska Tsunami Warning Center	http://wcatwc.arh.noaa.gov
Pacific Tsunami Warning Center	http://www.prh.noaa.gov/ptwc
NOAA Tsunami Program	http://www.tsunami.gov
NTHMP:	http://nthmp.tsunami.gov
ICG/CARIBE-EWS	http://www.ioc-tsunami.org/
Caribbean Tsunami Warning Programme	http://www.srh.noaa.gov/srh/ctwp

Insert state/local emergency response URLs

Intergovernmental Oceanographic Commission
technical series

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EXERCISE CARIBE WAVE 11
Exercice d'alerte au tsunami dans les Caraïbes

Manuel du participant

23 mars 2011

Preparé par le Groupe intergouvernemental de coordination du Système d'alerte aux tsunamis et autres risques côtiers dans la mer des Caraïbes et les régions adjacentes

UNESCO 2010

Série technique de la COI, n° 93
Paris, novembre 2010
Anglais/Français/Espagnol*

À des fins bibliographiques, le présent document doit être cité comme suit :

Commission océanographique intergouvernementale. *Exercise Caribe Wave 11 —Exercice d'alerte au tsunami dans les Caraïbes, 23 mars 2011. Manuel du participant.* Série technique de la COI, n° 93. Paris, UNESCO, 2011. (Anglais/Français/Espagnol)

(IOC/2010/TS/93 rev.)

Imprimé en 2010
par l'Organisation des Nations Unies pour l'éducation, la science et la culture
7, place de Fontenoy, 75352 Paris 07 SP

* Les Appendices III, IV, V et VI sont disponibles en anglais seulement dans la partie anglaise du rapport.

TABLE DE MATIÈRES

APPENDICES

[1] L'appendice III est disponible en anglais seulement dans la partie anglaise du rapport

[2] L'appendice IV est disponible en anglais seulement dans la partie anglaise du rapport (paragraphe introductif en français inclus)

[3] L'appendice V est disponible en anglais seulement dans la partie anglaise du rapport

[4] L'appendice VI est disponible en anglais seulement dans la partie anglaise du rapport

1. HISTORIQUE

L'**exercice CARIBE WAVE 11/LANTEX** est mené pour contribuer à l'action visant à élever le niveau de préparation aux tsunamis à travers toute la région des Caraïbes. De récents événements, tels les tremblements de terre et tsunamis de l'océan Indien, en 2004, de Samoa, en 2009, et de Haïti et du Chili, en 2010, témoignent de l'importance d'une planification adéquate des mesures destinées à faire face à un éventuel tsunami.

Les archives historiques émanant de sources comme le National Geophysical Data Center (NGDC) de la National Oceanic and Atmospheric Administration (NOAA) montrent que plus de 75 tsunamis, avec une fiabilité supérieure à 1, ont été relevés dans les Caraïbes au cours des 500 dernières années (figure 1). Ce chiffre représente 7 à 10 % environ du total mondial de tsunamis océaniques. Qu'ils soient générés par un tremblement de terre ou un glissement de terrain ou qu'ils soient d'origine volcanique, des tsunamis ont frappé la région, où, depuis 1842, ils ont fait au moins 3 510 morts. Les dernières années ont été marquées par une explosion de la croissance démographique et l'afflux de touristes le long du littoral caraïbe, ce qui augmente la vulnérabilité de la région. Outre les tsunamis, celle-ci a aussi une longue histoire de séismes destructeurs. Il ressort des archives historiques que des séismes de forte magnitude ont frappé la région des Caraïbes à de nombreuses reprises au cours des 500 dernières années

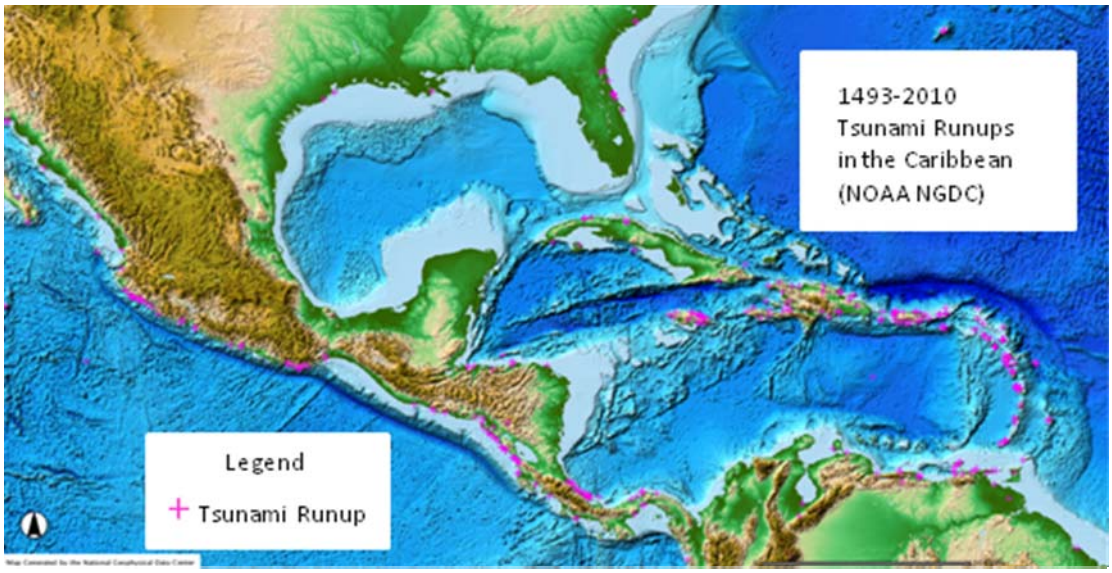

Figure 1. Carte des runups de tsunamis dans les Caraïbes 1493-2010 (National Geophysical Data Center, http://www.ngdc.noaa.gov/hazards/tsu.shtml).

À l'intérieur de la région, de multiples segments de faille et caractéristiques sous-marines pourraient être à l'origine des tsunamis provoqués par un tremblement de terre ou un glissement de terrain (figure 2). Le périmètre de la plaque Caraïbe est entouré d'au moins quatre grandes plaques (Amérique du Nord, Amérique du Sud, Nazca et Cocos). Une subduction se produit le long des marges atlantiques est et nord-est de la plaque Caraïbe. Des failles normales, transformantes et décrochantes caractérisent le nord de l'Amérique du Sud, l'est de l'Amérique centrale, la ride et la fosse des Caïmans et la bordure nord de la plaque (Tarr et col., 2007).

Dans le nord-est des Caraïbes, la fosse de Porto Rico, à peu près parallèle à la côte septentrionale portoricaine et à 120 kilomètres environ de la côte, est d'environ 900 kilomètres de long et 100 kilomètres de large (figure 3). À 8 350 mètres au-dessous de la surface de la mer, la fosse représente le point le plus profond de l'océan Atlantique. La fosse

d'Hispaniola, parallèle à la côte septentrionale de la République dominicaine et d'Haïti, est de 550 kilomètres de long, mais sa profondeur n'est que de 4 500 mètres. Les fossés des îles Vierges et d'Anegada coupent l'arc des Antilles entre le nord des îles Vierges et Sainte-Croix et les Petites Antilles. Des tsunamis pourraient naître le long de ces différentes structures, mais la direction et la taille des vagues varieraient en fonction de nombreux facteurs, y compris le lieu où s'est produit le séisme. En 1867, un séisme de magnitude 7,3 s'est produit à l'intérieur du bassin, qui a provoqué un tsunami, avec des hauteurs de vague de près de 7,6 mètres à Sainte-Croix (îles Vierges américaines), de 10 mètres à Deshaies (Guadeloupe), observé à travers le nord-est et l'est des Caraïbes (Reid et Taber, 1920 ; Watlington, 1997). Cet événement sera utilisé comme base du présent exercice.

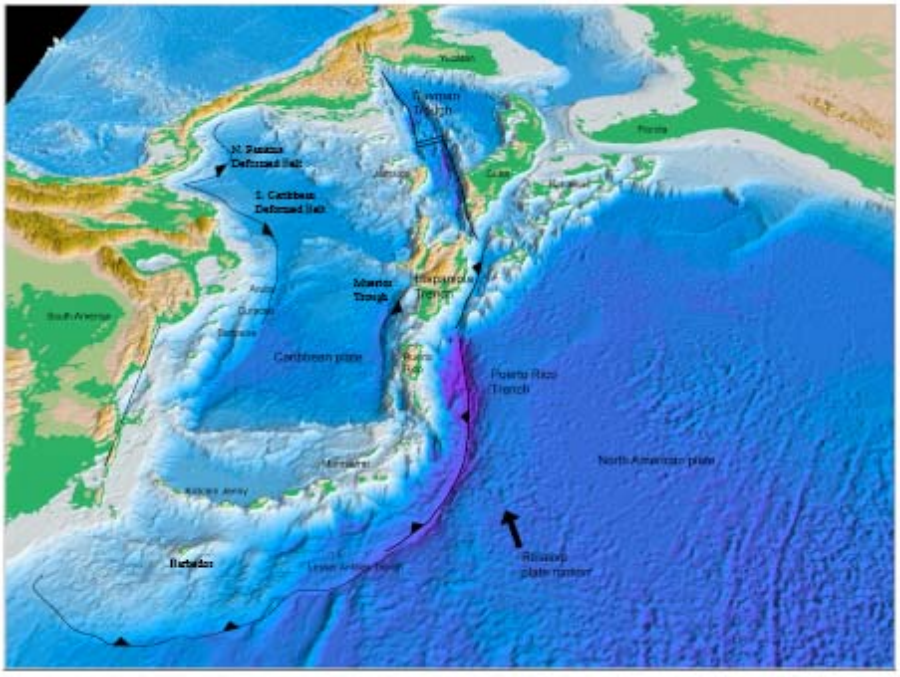

Figure 2. Caractéristiques tectoniques dans les Caraïbes (ten Brink et col., 2008)

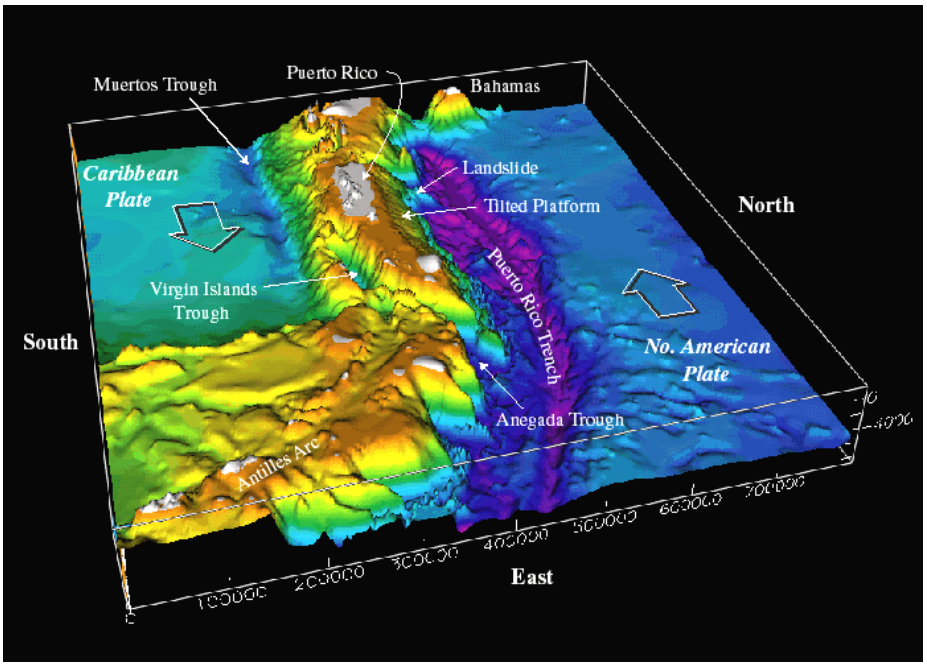

Figure 3. Caractéristiques tectoniques dans le nord-est caraïbe (ten Brink et col., 2008)

Les services d'alerte aux tsunamis pour les Caraïbes sont, à l'heure actuelle, fournis par le Centre d'alerte aux tsunamis de la côte Ouest et de l'Alaska (WCATWC), à Palmer (Alaska), pour Porto Rico et les îles Vierges, tandis que le Centre d'alerte aux tsunamis dans le Pacifique (PTWC), à Ewa Beach (Hawaii), dessert les Antilles non américaines. Ces centres communiquent à la région des produits relatifs aux tsunamis deux à dix minutes après un séisme. Les produits du WCATWC consistent en alertes, avertissements, veille et bulletins d'information, tandis que ceux du PTWC comprennent des bulletins d'information et avis de veille. Les destinataires des messages émis par les TWC comprennent, au premier chef, les points focaux nationaux d'alerte aux tsunamis, les bureaux de prévision météorologique, les points d'alerte/centres d'opération d'urgence de l'Etat/du territoire, les services nationaux des garde-côtes, et les contacts militaires. Ces organismes diffusent les messages aux personnes qui sont potentiellement exposées aux effets d'un tsunami. Le réseau sismique portoricain (PRSN) de l'Université de Porto Rico, à Mayagüez, l'Instituto Nicaraguense de Estudios Territoriales (INETER) au Nicaragua, la Fundación Venezolana de Investigaciones Sismológicas (FUNVISIS) au Venezuela, et d'autres organismes nationaux et régionaux fournissent également des renseignements relatifs aux tremblements de terre et aux tsunamis à leurs zones de responsabilité.

Le Groupe intergouvernemental de coordination du Système d'alerte aux tsunamis et autres risques côtiers dans la mer des Caraïbes et les régions adjacentes (ICG/CARIBE-EWS) de l'Organisation des Nations Unies pour l'éducation, la science et la culture (UNESCO), l'Agence caraïbe de gestion d'urgence des catastrophes (CDEMA), le Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (CEPREDENAC), la NOAA, et le programme national des Etats-Unis d'atténuation du risque de tsunami (NTHMP) fournissent le cadre du présent exercice. Celui-ci vise à offrir à tous ceux qui, à travers les Caraïbes, sont chargés de la gestion des situations d'urgence la possibilité de mettre à l'épreuve et à jour leurs plans d'intervention destinés à faire face à un éventuel tsunami. Les niveaux élevés de vulnérabilité et de menace qui pèsent sur de nombreux pays de la région devraient inciter fortement les autorités locales à se préparer à un tsunami.

Dans le cadre du présent exercice des messages, simulés d'alerte, de veille, et d'avertissement seront émis par les TWC sur la base d'un tremblement de terre hypothétique de magnitude 7,6 situé près des îles Vierges américaines (18.2oNord 65.3°Ouest). Des exercices tels que celui-ci contribueront à garantir que le littoral Caraïbe est prêt à faire face à un éventuel tsunami dangereux. De récents exercices analogues menés dans les bassins Pacifique et Atlantique se sont révélés efficaces quant au renforcement des niveaux de préparation des organismes de gestion des situations d'urgence.

2. CONCEPT DE L'EXERCICE

2.1 OBJET

L'exercice a pour objet d'améliorer l'efficacité du système d'alerte aux tsunamis le long du littoral Caraïbe. Il offre aux organismes de gestion des situations d'urgence à travers la mer des Caraïbes l'occasion de tester leurs lignes opérationnelles de communication, de réexaminer leurs procédures d'intervention et de favoriser la préparation aux tsunamis. Une mise en œuvre périodique des plans d'intervention est d'une importance cruciale pour le maintien de l'état de préparation à une situation d'urgence. Cela est particulièrement vrai dans le cas des tsunamis, qui ne sont pas fréquents mais qui ont un grand impact. Tous les organismes de gestion de situations d'urgence (EMO) de la région sont encouragés à participer.

2.2 OBJECTIFS

Chaque organisme peut mettre au point des objectifs pour l'exercice en fonction de son niveau d'implication dans le scénario.

Les objectifs suivants sont prépondérants :

1. Assurer la transmission de messages des TWC aux points focaux pour l'alerte aux tsunamis (TWFP) et, à partir de ces destinataires prioritaires, aux EMO
2. Tester les plans d'intervention des EMO de la région des Caraïbes qui ont élaboré des plans, et, dans le cas de ceux qui n'ont élaboré aucun plan, agir comme catalyseur.
3. Les EMO, TFWP et les contacts nationaux pour les tsunamis examinent les diverses possibilités en matière de communication pour la réception et la diffusion des messages relatifs aux tsunamis, échangent leurs vues à leur sujet, et les évaluent.
4. Les EMO, TFWP et les contacts nationaux pour les tsunamis examinent les interventions potentielles et les enjeux, échangent leurs vues à leur sujet, et les évaluent.
5. Définir des procédures pour l'émission d'avis locaux de fin d'alerte.

2.3 TYPE D'EXERCICE

Il conviendrait de mener l'exercice de telle manière que les communications et la prise de décisions à divers niveaux de l'organisation puissent faire l'objet d'un entraînement normal sans perturber ni alarmer le grand public. Toutefois, certaines localités peuvent, à titre individuel et à leur discrétion, choisir d'étendre leur exercice au niveau de la vérification du fonctionnement des systèmes locaux de notification tels que le système d'alerte en cas de situation d'urgence, les sirènes et les haut- parleurs.

Les exercices stimulent l'élaboration des plans à exécuter en cas de catastrophe et des procédures opérationnelles normalisées, la formation à l'exécution de ces plans, leur mise à l'épreuve et leur évaluation. Les participants aux exercices peuvent utiliser leurs propres exercices multi-aléas antérieurs (par exemple inondation, ouragan, tsunami, tremblement de terre, etc.) comme cadre pour procéder à l'exercice CARIBE WAVE 11/LANTEX 11.

On peut procéder aux exercices à diverses échelles de grandeur et de complexité. Ci-après on trouvera des exemples de types d'exercices relevant des EMO :

1. **Exercice d'orientation (séminaire):** Un exercice d'orientation jette les bases d'un programme d'ensemble d'exercices. Il s'agit d'un événement planifié, mis au point de manière à réunir des personnes et des responsables qui, à un titre ou un autre, s'occupent de la planification des plans d'intervention multi-aléas, de la solution de problèmes, de l'élaboration de procédures opérationnelles normalisées, et de l'intégration et de la coordination des ressources, ou s'y intéressent. Un exercice d'orientation aura un but particulier et des objectifs écrits. Il débouchera sur un plan d'action convenu.
2. **Entraînement**: L'entraînement est une activité planifiée qui met à l'épreuve, développe et/ou maintient les compétences en une seule procédure ou en une procédure limitée d'intervention en cas de situation d'urgence. D'une manière générale, les entraînements impliquent une intervention opérationnelle de la part de services ou d'organismes individuels. Ils peuvent comprendre des notifications internes et/ou des activités de terrain.
3. **Exercice en salle**: L'exercice en salle est une activité planifiée dans laquelle des responsables locaux, le personnel clé, et les organismes chargés de la gestion des

catastrophes sont mis en face de situations d'urgence simulées. Il a habituellement un caractère informel, se déroule dans une salle de conférences, et est conçu pour amener les participants à procéder à un échange constructif de vues. Les participants examineront des problèmes énoncés sur la base de plans ou de procédures, s'ils existent, et tenteront de les résoudre. Ils seront encouragés à examiner les problèmes en profondeur en privilégiant la recherche de solutions à un rythme lent plutôt qu'une décision rapide en temps réel. Un exercice en salle devrait avoir des buts et objectifs particuliers et un narratif de scénario (voir à l'appendice I un modèle de schéma d'exercice en salle).

4. **Exercice fonctionnel**: Un exercice fonctionnel est une activité planifiée conçue pour tester et évaluer les capacités sur le plan de l'organisation. Il vise aussi à évaluer le potentiel du système de gestion de situations d'urgence d'une communauté en testant le plan d'opérations en cas de situation d'urgence. Il s'appuie sur une simulation d'une situation d'urgence proche de la réalité, qui comprend une description de la situation (narratif), avec communications entre acteurs et simulateurs. L'exercice fonctionnel fait vivre aux acteurs (décideurs) l'expérience entièrement simulée d'une implication dans une catastrophe de grande envergure. Il devrait se dérouler en un lieu approprié de coordination (centre d'opérations ou de contrôle en cas de situation d'urgence, centre directeur de contrôle, etc.) et mettre en jeu toutes les personnes concernées que désigne le plan. Les organismes tant internes qu'externes (organismes gouvernementaux, secteur privé, et bénévoles) devraient être impliqués. L'exercice exige le concours d'acteurs, de contrôleurs, de simulateurs et d'évaluateurs. La circulation des messages sera simulée et les messages seront insérés par l'équipe de contrôle afin que les acteurs réagissent/agissent compte tenu des contraintes du temps réel. Il peut comprendre ou ne pas comprendre des évacuations de population. Un exercice fonctionnel devrait avoir des buts et objectifs particuliers et un narratif de son déroulement.

5. **Exercice grandeur nature**: Un exercice grandeur nature est l'aboutissement d'un programme graduel d'exercices qui a évolué au même pas que l'aptitude d'une communauté déterminée à procéder à des exercices. Il s'agit d'une activité planifiée dans un environnement riche en défis, qui embrasse une majorité des fonctions de gestion des situations d'urgence. Ce type d'exercice exige la mobilisation et le déploiement effectifs des ressources humaines et autres ressources appropriés dont on a besoin pour démontrer les capacités opérationnelles. Les EOC et autres centres de contrôle devront entrer en jeu. L'exercice grandeur nature est le type d'exercice de la plus grande ampleur, le plus coûteux et le plus complexe. Il peut comprendre ou ne pas comprendre des évacuations de population.

Exemple de calendrier pour les différents types d'exercice

Type	Période de planification	Durée	Observations
Exercice d'orientation	2 semaines	1 jour	Groupes individuels ou mixtes
Entraînement	2 journées	1 jour	Groupes techniques individuels, en général
Exercice en salle	2 semaines	1 à 3 jours	Un seul ou plusieurs organismes
Exercice fonctionnel	1 à 2 mois	1 à 5 jours	Participation de plusieurs organismes
Exercice grandeur nature	2 à 6 mois	1 jour/ semaine	Participation de plusieurs organismes

3. SCHÉMA DE L'EXERCICE

3.1 GÉNÉRALITÉS

La documentation relative aux tsunamis est fondée principalement sur les observations du tremblement de terre et du tsunami qui ont frappé les îles Vierges, en 1867. L'information de base relative à cet événement est tirée des sources suivantes : « Disaster and Disruption in 1867: Hurricane, Earthquake, and Tsunami in the Danish West Indies » (Watlington et Lincoln, 1997), « Caribbean Tsunamis » (O'Laughlin et Lander, 2003), site Internet de l'Université de Californie du Sud (USC) sur les tsunamis (voir ci-après), « The 1867 Virgin Island Tsunami » (Zahibo, 2003), le rapport de l'USGS destiné à la Commission de régulation nucléaire : « Evaluation of Tsunami Sources with the Potential to Impact the U.S. Atlantic and Gulf of Mexico Coasts » (ten Brink et col., 2008), et « Tsunami Simulations of the 1867 Virgin Island Earthquake: Constraints on Epicenter Location and Fault Parameters » (Barkan et ten Brink, 2010). Les cartes d'inondation due au tsunami pour Porto Rico comprenaient les scénarios relatifs au fossé des îles Vierges/Anegada fondés sur « Mode of Faulting in the Local Zone of Puerto Rico (LZPR) » par Huérfano Moreno (2003).

On peut consulter un bref résumé de l'événement de 1967 sur le site Internet du Groupe de recherche sur les tsunamis de l'USC, à l'adresse suivante : http ://www.usc.edu/dept/tsunamis/caribbean/webpages/1867viindex.html

L'épicentre historique approximatif (sur la base de l'information émanant de l'USC) est indiqué sur la figure 4 ci-après.

On a établi sur ordinateur des modèles de tsunami en utilisant l'Alaska Tsunami Forecast Model (ATFM) du WCATWC et le Rapid Inundation and Forecasting of Tsunamis (RIFT) du PTWC pour produire les effets attendus à travers toute la région. Les modèles ont indiqué un tsunami conséquent dans l'est des Caraïbes, avec peu d'effet à l'extérieur des Caraïbes. Sur la base de ces modèles, l'exercice était limité à la région caraïbe et ne vise pas d'autres zones de responsabilité des TWC dans l'Atlantique ou le golfe du Mexique. Les modèles de tsunami sont fondés sur l'événement de 1867 en tant que double source de séisme dans le fossé des îles Vierges, avec une soixantaine de kilomètres entre les deux épicentres et 5 minutes entre les temps d'origine. Les paramètres de la source du séisme sont les suivants :

Source 1 :

heure= 13h00 TUC, M 7.6, épicentre {18.21Nord 65.26Ouest, direction (strike) = 71o, pendage (dip), 8o, angle de glissement (slip), 90o.

Source 2 :

heure = 13h05 TUC, M 7.6, épicentre {18.36Nord 64.73Ouest}, direction (strike) = 71o, pendage (dip), 8o, angle de glissement (slip), 90o.

On a utilisé des formules de déplacement du fond océanique pour générer les deux soulèvements initiaux et la propagation du tsunami à partir de ces sources, calculée sur la base de l'ATFM, pour produire les prévisions d'amplitudes le long des côtes américaines de l'Atlantique et du golfe du Mexique, et à travers les Caraïbes. Les résultats de la modélisation figurent à l'Appendice II.

Figure 4. Emplacement approximatif du séisme et du tsunami du 18 novembre 1867

Au stade initial, une alerte au tsunami est émise par le WCATWC, visant Porto Rico et les îles Vierges, tandis que le PTWC émet un avis de veille régionale au tsunami. La côte orientale des Etats-Unis et le golfe du Mexique sont inclus dans le message du WCATWC, lequel est transmis uniquement à titre d'information, la menace d'un tsunami dans ces parages étant minimale. Les définitions des produits qui seront émis par les TWC pendant l'exercice sont données ci-après (noter que les produits du PTWPC sont différents de ceux du WCATWC du fait des conditions énoncées par l'ICG/CARIBE-EWS) :

Centre d'alerte aux tsunamis de la côte ouest et de l'Alaska :

Alerte au tsunami – Une alerte au tsunami est émise lorsqu'un tsunami potentiel, avec une inondation conséquente de grande envergure, est imminent ou attendu. Les alertes informent le public qu'une inondation côtière, de grande envergure et dangereuse, accompagnée de courants puissants, est possible et peut continuer pendant plusieurs heures après l'arrivée de la vague initiale. Les gestionnaires des situations d'urgence sont invités à agir pour la zone entière exposée au risque de tsunami. Les actions appropriées que doivent engager les responsables locaux peuvent comprendre l'évacuation des zones côtières de faible élévation et celle des navires vers les eaux profondes, lorsqu'il y a suffisamment de temps pour le faire en toute sécurité. On peut actualiser une alerte, en modifier la couverture géographique, lui attribuer un statut inférieur ou l'annuler. Pour assurer une alerte dans les plus brefs délais, les alertes initiales sont normalement fondées uniquement sur l'information sismique.

Avertissement – Un avertissement est émis en cas de menace d'un tsunami potentiel qui est de nature à générer des courants forts ou des vagues dangereuses pour les personnes se trouvant dans l'eau ou près de l'eau. Les régions côtières qui sont historiquement sujettes aux dégâts causés par les courants forts induits par les tsunamis sont exposées au risque le plus élevé. La menace peut persister pendant plusieurs heures après l'arrivée de la première vague, mais une inondation conséquente de grande envergure n'est pas attendue dans le cas des zones visées par un avertissement. Parmi les actions appropriées que doivent engager les responsables locaux peuvent figurer notamment la fermeture des plages, l'évacuation des ports et ports de plaisance, et l'évacuation des navires vers les eaux profondes, lorsqu'il y a suffisamment de temps pour le faire en toute sécurité. On met normalement à jour un avertissement pour le maintenir, pour étendre/rétrécir sa zone de couverture, pour l'élever au rang d'une alerte, ou pour l'annuler.

Centre d'alerte aux tsunamis dans le Pacifique :

Veille au tsunami – Les avis de veille sont émis par les TWC sur la base d'informations sismiques sans confirmation qu'un tsunami destructeur est imminent. Ils sont émis pour prévenir, à un stade précoce, les zones qui pourraient subir les effets de vagues destructrices générées par un tsunami. On les actualise au moins toutes les heures pour les maintenir, pour étendre leur zone de couverture, pour les élever au rang d'alerte, ou pour lever l'alerte. Un message de veille destiné à une zone déterminée peut être inclus dans le texte d'un message d'alerte adressé à une autre zone.

Bulletin d'information sur les tsunamis (TIB) – Un produit sous forme de texte est émis pour informer qu'un tremblement de terre s'est produit et pour donner un avis quant à la possibilité éventuelle d'un tsunami qu'il pourrait générer. Dans la plupart des cas, un TIB indique qu'il n'existe aucune menace d'un tsunami destructeur, et on l'utilise pour empêcher les évacuations inutiles alors que le tremblement de terre peut avoir été ressenti dans les zones côtières. Un TIB peut, dans des situations appropriées, être une mise en garde quant à la possibilité d'un tsunami destructeur local. On peut émettre un TIB complémentaire à la réception d'une information supplémentaire importante, tel un relevé du niveau de la mer indiquant un signal de tsunami. On peut aussi élever un TIB au rang de veille, d'avertissement ou d'alerte, selon le cas.

Les TWC n'émettront pas des messages en direct sur les chaînes de radiodiffusion, à part un message fictif initial destiné à donner le signal du commencement de l'exercice, le 23 mars 2011, à 13 h 02 TUC. Toutefois, les messages émanant des TWC seront transmis par courrier électronique et par télécopie aux destinataires qui auront expressément demandé à recevoir les messages en direct pendant toute la durée de l'exercice. On trouvera à l'annexe C le contenu du message fictif, lequel indiquera que les participants à l'exercice doivent se reporter au premier message reproduit dans le présent manuel. Ils doivent ensuite suivre le plan figurant au tableau 1 pour consulter les nouveaux messages s'ils ne les reçoivent pas par courrier électronique ou par télécopie. Le tableau 1 est la table horaire des messages qui seraient émis par le TWC s'il s'agissait d'un événement réel, et peut être utilisé par les EMO aux fins de l'exercice. Les messages d'alerte (figurant à l'Appendice IV) couvrent une période de 5 heures, mais dans un événement réel ils continueraient vraisemblablement plus longtemps. Les en-têtes de l'Organisation météorologique mondiale (OMM) et de l'Advanced Weather Interactive Processing System (AWIPS) utilisés dans le message fictif font l'objet de la liste du tableau 2.

Pendant les événements réels, le WCATWC émet deux produits officiels chaque fois qu'un message est émis. Le premier, comme ceux qui figurent à l'Appendice IV, est connu en tant que message normalisé. Il s'agit d'un message comportant des segments et comprenant des zones NWS codées, l'heure d'arrivée prévue de la première vague (VTEC - Valid Time Event Codes), et leur niveau de menace dans la section inférieure du message. La segmentation est utilisée pour les systèmes de traitement automatisé qui analysent les produits du NWS. Le produit normalisé donne aussi la liste des heures d'arrivée attendues. Le second produit est connu en tant que message public. Le message ne comporte pas de segment ; il est écrit dans un format qui n'est pas un tableau et qui est plus facile à lire. Les produits contiennent la même information de base. Les EMO utilisent, d'une manière générale, le produit normalisé aux fins de la réaction à une alerte car il contient une information plus complète. Le WCATWC ajoute aussi des produits graphiques et informatiques à son site Internet. On en trouvera des exemples à l'Appendice V.

Les participants peuvent choisir de procéder à l'exercice en utilisant leur propre calendrier en vue de réaliser leurs propres objectifs. Ainsi, le contrôleur de l'exercice d'un EMO donné peut ou bien alimenter l'exercice de bulletins TWC aux heures de leur propre choix, ou bien les placer dans des enveloppes sur lesquelles est écrite l'heure à laquelle elles doivent être ouvertes, chaque organisme participant clé ayant son propre jeu d'enveloppes. Les

messages reproduits à l'Appendice IV faciliteront cette démarche. Pour le présent exercice, outre le premier message fictif, le WCATWC et le PTWC transmettront les messages par courrier électronique et par télécopie aux participants qui auront demandé ce service.

Les EMO auront toute latitude pour modifier les heures estimatives d'arrivée et/ou les amplitudes des vagues en fonction de leur exercice - par exemple, en faisant arriver le tsunami plus tôt, avec une plus forte amplitude. D'autres éléments complémentaires, tels des comptes rendus de dégâts causés par le tsunami, sont également encouragés.

3.2 PLAN DIRECTEUR (SCRIPT DE L'EXERCICE)

Tableau 1 : Déroulement du scénario

Tsunami généré par un tremblement de terre de magnitude 7,6, coordonnées de l'épicentre : 18.2ºN, 65.3ºO survenant le 23 mars 2011 à 13h00 TUC, et un second tremblement de terre se produisant à proximité, 5 minutes plus tard. L'avis initial d'alerte est diffusé à 13h02 TUC.

Date (TUC)	heure (TUC)	Message WCATWC				Message PTWC			
		#	Type	Fictif	Email	#	Type	Fictif	Email
03/23/2011	1300		- - - - - - le séisme se produit - - - - - -						
03/23/2011	1302	01	Alerte	Oui	Oui	01	Alerte	Oui	Oui
03/23/2011	1332	02	Alerte	Non	Oui				
03/23/2011	1401	03	Alerte	Non	Oui	02	Veille	Non	Oui
03/23/2011	1431	04	Alerte	Non	Oui				
03/23/2011	1500	05	Alerte	Non	Oui	03	Veille	Non	Oui
03/23/2011	1530	06	Alerte	Non	Oui				
03/23/2011	1601	07	Avert.	Non	Oui	04	Veille	Non	Oui
03/23/2011	1630	08	Avert.	Non	Oui				
03/23/2011	1701	09	Annul.	Non	Oui	05	Veille	Non	Oui
03/23/2011	1802					06	Annul.	Non	Oui

Le message fictif initial sera diffusé sur toutes les chaînes normalisées de radiodiffusion dont la liste figure au tableau 2. Ce message est diffusé afin de tester les communications établies avec les EMO et les points focaux d'alerte aux tsunamis et afin de démarrer l'exercice. Tous les messages seront diffusés sur la base d'une liste spéciale de courrier électronique afin qu'ils parviennent en temps réel aux organismes demandant ce service. Pour demander ce service, prière de contacter Christa von Hillebrandt (adresse à 3.5), en communiquant le nom de votre organisme et votre adresse électronique.

Types de messages des TWC :

Alerte	Alerte au tsunami
Avertissement	Avertissement au tsunami
Veille	Veille au tsunami
Annul.	Annulation

Message fictif :

Oui	Message fictif émis
Non	Pas de message fictif émis

Email :

Oui	Message diffusé sur la base d'une liste spéciale de courrier électronique
Non	Message non diffusé sur la base d'une liste spéciale de courrier électronique

Tableau 2 : Types de produits

Types de produits émis pour le message fictif, avec méthodes de transmission

Centre	ID OMM	ID AWIPS	NWWS	SMT	EMWIN	Fax	Email
WCATWC	WEXX20 PAAQ	TSUAT1	Oui	Oui	Oui	Oui	Oui
PTWC	WECA41 PHEB	TSUCAX	Oui	Oui	Oui	Oui	Oui

NWWS NOAA Weather Wire Service
GTS Système mondial de télécommunications
EMWIN Réseau d'information météorologique pour les responsables des situations d'urgence

3.3 ACTIONS EN CAS D'ÉVÉNEMENT RÉEL

Si un événement réel survient pendant l'exercice, les TWC émettent les messages qui sont prévus normalement pour l'événement. Ces messages se verront assigner une priorité absolue, et les TWC décideront s'il y a lieu d'émettre le message fictif et d'adresser des messages par courrier électronique à des destinataires choisis. Les tremblements de terre de faible magnitude, qui ne donnent lieu qu'à un bulletin d'information, ne perturberont pas l'exercice. Toute documentation et correspondance relatives au présent exercice devra être clairement étiquetée **« CARIBE WAVE 11/LANTEX 11 »** et **« Exercice »**.

3.4 PROCÉDURE FAUSSE ALERTE

Chaque fois que l'on procède à des exercices de simulation d'une catastrophe, le risque existe que le public ou les médias pensent qu'il s'agit d'un événement réel. Toutes les entités participantes devraient établir des procédures pour répondre aux préoccupations du public ou des médias concernant le présent exercice et éviter que celui-ci ne fasse l'objet d'une interprétation erronée de leur part.

3.5 RESSOURCES

Les EMO auront certes un préavis de l'exercice et auront la possibilité de mettre en place une équipe spécialisée pour s'assurer que les principales affaires courantes se poursuivent sans interruption. Néanmoins, il est demandé que des niveaux réalistes de ressources soient déployés compte tenu de quelques-uns des problèmes auxquels il faudra vraisemblablement faire face dans un événement réel.

Les questions relatives à l'exercice peuvent être adressées à:

Personne	**Numéro de téléphone**	**Courier électronique**
Lorna Inniss, présidente	246-228-5950	linniss@coastal.gov.bb
Francisco Garces, vice-prés	58-212-2575153	fgarces@funvisis.gob.ve
Frederique Martini, vice-prés	Frederique.MARTINI@developpement-durable.gouv.fr	
Christa von Hillebrandt, vice –prés, directrice NWS CTWP	787-833-8433	christa.vonh@noaa.gov
Emilio Talavera, prés WG1	505-22492761	emilio.talavera@gf.ineter.gob.ni
Aurelio Mercado, prés. WG2	787-265-5461	aurelio.mercado@upr.edu
Rafael Mojica, prés. WG3	787-253-4586	rafael.mojica@noaa.gov
Dimas Alonso, prés. WG4	504-2290606 x401	alonzoaguadesastres@yahoo.com
Bernardo Aliaga, secrétaire technique	33-1-45683980	b.aliaga@unesco.org
Jeremy Collymore, dir. ex CDEMA	246-425-0386	Jeremy.Collymore@cdema.org

Personne	Numéro de téléphone	Courier électronique
Walter Wintzer, CEPREDENAC	502-2362-1981-83	wwintzer@sica.int
Ivan Morales, CEPREDENAC	502-2362-1981-83	imorales@sica.int
Melinda Bailey, NWS région Sud	817-978-1100x107	melinda.bailey@noaa.gov
Wilfredo Ramos, rep. PREMA .	787-724-0124	wramos@aemead.gobierno.pr
Jacqueline Heyliger, rep VITEMA .	340-773-2244	jjheyliger@yahoo.com
Paul Whitmore, dir WCATWC	907-745-4212	paul.whitmore@noaa.gov
Bill Knight WCATWC TWSO	907-745-4212	william.knight@noaa.gov
James Waddell, rep WCATWC.	907-745-4212	james.waddell@noaa.gov
Charles McCreery, dir PTWC	808-689-8207	charles.mccreery@noaa.gov
Stuart Weinstein PTWC TWSO	808-689-8207	stuart.weinstein@noaa.gov
Gerard Fryer, rep PTWC.	808-689-8207	gerard.fryer@noaa.gov
Victor Huerfan, dir.PRSN	787-833-8433	victor@prsn.uprm.edu

3.6 ARRANGEMENTS RELATIFS AUX MÉDIAS

Un avantage de l'exercice réside dans le fait qu'il fournit un lieu permettant une sensibilisation au thème de l'exercice. De nombreux habitants du littoral de la mer des Caraïbes ne se rendent peut-être pas compte de l'existence d'un système d'alerte aux tsunamis pour leur région, et, à plus forte raison, de ce qu'ils devraient faire en cas de catastrophe. Certaines communautés souhaiteront sans doute inviter leurs médias locaux à l'exercice afin de faire prendre davantage conscience à la population locale du danger de tsunami. On trouvera à l'Appendice VI un modèle de communiqué de presse qui peut être modifié selon que de besoin.

La NOAA diffusera plusieurs jours avant l'exercice un communiqué de presse décrivant l'exercice et son objet.

4. ÉVALUATION APRÈS L'EXERCICE

Tous les organismes participants sont priés de fournir un bref retour d'information sur l'exercice qui aidera l'ICG/CARIBE-EWS, le NTHMP, et la NOAA à évaluer CARIBE WAVE 11/LANTEX 11 et à mettre au point des exercices ultérieurs, et les organismes d'intervention à répertorier les enseignements tirés.

Veuillez fournir la rétroaction le 11 avril 2011 au plus tard au site Internet du NTHMP dont l'adresse suit : http ://nthmp.tsunami.gov/exercise2011.php

5. RÉFÉRENCES

Barkan, R. et U. ten Brink, U. (2010). Tsunami Simulations of the 1867 Virgin Island Earthquake : Constraints on Epicenter Location and Fault Parameters. Bull. of the Seismol. Soc. Am., 100, No. 3, p. 99 à 1009, doi : 10.1785/0120090211.

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Watlington, R.A. et Lincoln, S.H. (1997). Disaster and Disruption in 1867 : Hurricane, Earthquake, and Tsunami in the Danish West Indies, Eastern Caribbean Center. University of the Virgin Islands, 134 p.

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Appendice I. EXEMPLE D'EXERCICE EN SALLE

Marche à suivre pour la mise au point d'un exercice en salle
Source: California Office of Emergency Services

Un exercice en salle est une activité planifiée dans laquelle des responsables locaux, le personnel clé, et les organismes chargés de la gestion des catastrophes sont mis en face de situations d'urgence simulées. Il a habituellement un caractère informel, se déroule à un rythme lent, dans une salle de conférences, et est conçu pour amener les participants à procéder à un échange constructif de vues afin d'évaluer les plans, politiques et procédures. Les participants examineront des problèmes énoncés sur la base de plans ou de procédures, s'ils existent, et tenteront de les résoudre. Ils seront encouragés à examiner des décisions en s'appuyant sur les procédures opérationnelles normalisées (SOP) de leur organisme en privilégiant la recherche de solutions à un rythme lent plutôt qu'une décision rapide, en temps réel. Un contrôleur (modérateur) de l'exercice présente un scénario de tsunami fictif aux participants par le biais d'un message écrit, d'un appel téléphonique ou radio fictif, ou par d'autres moyens. Des problèmes et activités relatifs à l'exercice (apports) sont en outre présentés. Les participants procèdent à des discussions de groupe au cours desquelles des solutions sont convenues d'un commun accord, puis résumées par un chef de groupe. Un exercice en salle devrait voir des buts et objectifs particuliers et un narratif du déroulement.

On trouvera ci-après la structure d'un exercice en salle avec un modèle de texte et un exemple.

1. Analyse de vulnérabilité: énoncé du problème

Exemple possible pour un ouragan :
Du fait des récents incidents liés à des ouragans survenus dans la région du sud-est des Etats-Unis, on a pris davantage conscience du risque qu'implique ce genre de catastrophe et en conséquence de la nécessité vitale d'un système d'évacuation. L'Etat de Louisiane poursuit en permanence la planification, la préparation et la formation en vue d'élever son niveau de préparation à l'ouragan.

2. Objet (Mission): ce que vous avez l'intention de réaliser (déclaration générale)

Exemple possible pour un ouragan :
L'Etat de Louisiane s'est rendu compte de la nécessité d'un système d'évacuation plus efficace et plus efficient et reconnaît cette nécessité. C'est pourquoi il met en œuvre le présent plan d'ensemble d'exercice, qui comprend des séminaires, des ateliers, un exercice en salle, des exercices fonctionnels et grandeur nature s'étalant sur une période de 18 mois, au titre du State Homeland Security grant program.

3. Portée: Activités prévues dans le cadre de l'exercice
Organismes impliqués
Type d'aléa
Zone géographique d'impact

Exemple possible:
Les coordonnateurs des services d'urgence aux niveaux locaux du gouvernement de l'État détermineront, dans chacune des six régions d'aide mutuelle situées à travers l'ensemble de son territoire, des autorités représentatives qui accueilleront une série d'exercices de préparation aux catastrophes. Ces autorités hôtes mettront au point une série graduelle d'exercices, chaque exercice s'appuyant sur le précédent. Le processus commencera par une analyse de vulnérabilité des zones relevant de chaque autorité, puis se poursuivra avec un ensemble graduel d'activés, y compris des séminaires d'orientation, des ateliers, et des exercices fonctionnels et en salle. L'objectif final de ces

activités sera d'atténuer les effets de la catastrophe sur les populations et l'infrastructure des villes. Toutes les activités seront évaluées en conformité avec les normes applicables aux comptes rendus de fin de mission de l'US Homeland Security Exercise Evaluation Program (HSEEP). Des mesures seront prises en vue d'actions correctrices à l'issue du déroulement des activités et du compte rendu de fin de mission. Les autorités des zones voisines de la zone d'aide mutuelle apporteront leur concours en désignant les membres de l'équipe de concepteurs, les évaluateurs, ou les observateurs d'exercices aux fins de la transmission d'information destinée à élever leur niveau de préparation opérationnelle. Les autorités participeront à tour de rôle tous les deux ans, ce qui permettra d'accroître le nombre d'autorités locales participantes.

4. Buts et objectifs :

Critères d'un bon objectif : pensez SMART (les premières lettres des cinq alinéas qui suivent) **(**smart **:** astucieux**)**

- S. Simple (concis)
- M. Mesurable
- A. Atteignable (peut-on le réaliser pendant l'exercice ?)
- R. Réaliste (et exaltant)
- T. Axé sur les tâches (orienté vers les fonctions)

Exemple possible :

Objectifs d'un programme d'ensemble d'exercices

- *élever le niveau de préparation opérationnelle*
- *améliorer la coordination multi-organismes et les capacités d'intervention en vue de faire face d'une manière efficace à la catastrophe*
- *déterminer avant l'événement les circuits de communication et les questions litigieuses entre les autorités locales et la zone opérationnelle, les centres d'opérations d'urgence régionaux et ceux de l'État*
- *établir des méthodes uniformes de commande, de suivi et de fourniture de ressources aux organismes impliqués à tous les niveaux administratifs.*

5. **Narratif :**

Le narratif devrait décrire ce qui suit :

- déclencher la simulation de situation d'urgence/catastrophe
- décrire l'environnement au moment du démarrage de l'exercice
- fournir les renseignements de base nécessaires
- préparer les participants à l'exercice
- découverte, compte rendu : comment vous en êtes-vous aperçus ?
- préavis ?
- heure, lieu et étendue ou niveau des dégâts

6. Évaluation :

L'évaluation devrait décrire ce qui suit :

- en fonction des objectifs
- former des équipes d'évaluation
- élaborer des formulaires d'évaluation

7. Compte rendu de fin d'action : On devrait établir le compte rendu de fin d'action en utilisant les comptes rendus d'évaluations.

8. Plan d'amélioration : Le Plan d'amélioration devrait réduire les vulnérabilités.

Appendice II. Description du scénario

La documentation relative aux tsunamis est fondée principalement sur les observations du tremblement de terre et du tsunami de 1867 aux îles Vierges. L'information de base relative à cet événement est tirée des sources suivantes : « Disaster and Disruption in 1867: Hurricane, Earthquake, and Tsunami in the Danish West Indies » (Watlington et Lincoln, 1997), « Caribbean Tsunamis » (O'Laughlin et Lander, 2003), site Internet de l'Université de Californie du Sud (USC) sur les tsunamis (voir ci-après), « The 1867 Virgin Island Tsunami » (Zahibo, 2003), le rapport de l'USGS destiné à la Commission de régulation nucléaire : « Evaluation of Tsunami Sources with the Potential to Impact the U.S. Atlantic and Gulf of Mexico Coasts » (ten Brink et col., 2008), et « Tsunami Simulations of the 1867 Virgin Island Earthquake: Constraints on Epicenter Location and Fault Parameters » (Barkan et ten Brink, 2010).

On peut consulter un bref résumé de l'événement de 1967 sur le site Internet du Groupe de recherche sur les tsunamis de l'USC, à l'adresse suivante: http://www.usc.edu/dept/tsunamis/caribbean/webpages/1867viindex.html

On a établi sur ordinateur des modèles de tsunami en utilisant l'Alaska Tsunami Forecast Model (ATFM) du WCATWC et le Rapid Inundation and Forecasting of Tsunamis (RIFT) du PTWC pour produire les effets attendus à travers toute la région. Les modèles ont indiqué un tsunami conséquent dans l'est des Caraïbes, avec peu d'effet à l'extérieur des Caraïbes. Sur la base de ces modèles, l'exercice était limité à la région caraïbe et ne vise pas d'autres zones de responsabilité des TWC dans l'Atlantique ou le golfe du Mexique. Les modèles de tsunami sont fondés sur l'événement de 1867 en tant que double source de séisme dans le fossé des îles Vierges, avec une soixantaine de kilomètres entre les deux épicentres et 5 minutes entre les temps d'origine. Les paramètres des sources du séisme sont les suivants :

Source 1 :
heure= 13h00 TUC, M 7.6, épicentre {18.21Nord 65.26Ouest}.

Source 2 :
heure = 13h05 TUC, M 7.6, épicentre {18.36Nord 64.73Ouest}.

Les paramètres suivants sont identiques pour les deux sources :
Direction (strike) : 71°
Pendage (dip) : 8°
Angle de glissement (slip) : 90°
Longueur : 70km
Largeur : 35km
Profondeur : 7km
Moment : 7.5x1027 dyne-cm

On a utilisé des formules de déplacement du fond océanique pour générer les deux soulèvements initiaux et la propagation modélisée du tsunami à partir de ces sources, pour produire les prévisions d'amplitudes le long des côtes américaines de l'Atlantique et du golfe du Mexique, et à travers les Caraïbes. Les résultats de la modélisation figurent dans le tableau. Les prévisions d'amplitude sont calculées pour des points au large. La hauteur de la vague sur le rivage pourrait être le double de celle du modèle du fait de la longue période des tsunamis.

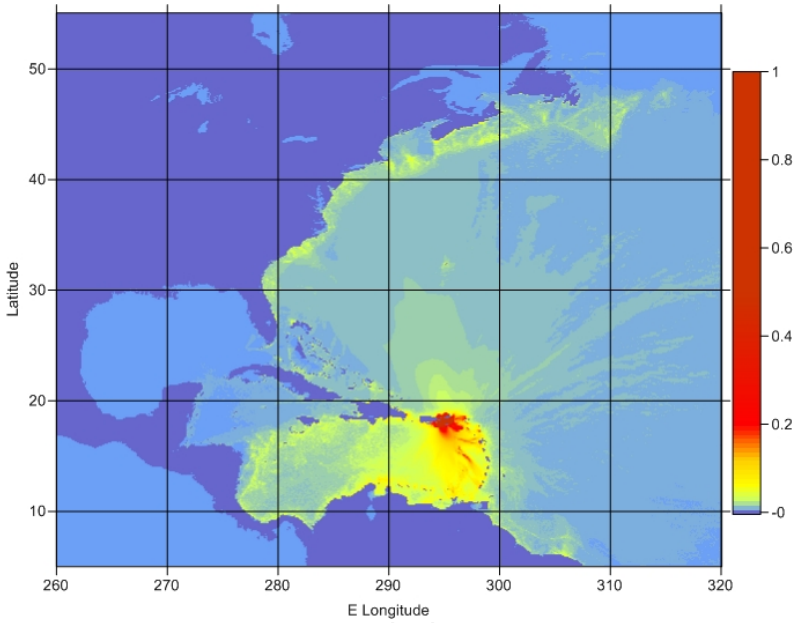

Figure II-1. Amplitude maximale de tsunami modélisée pour l'ensemble de l'Atlantique Nord (échelle en mètres - ATFM)

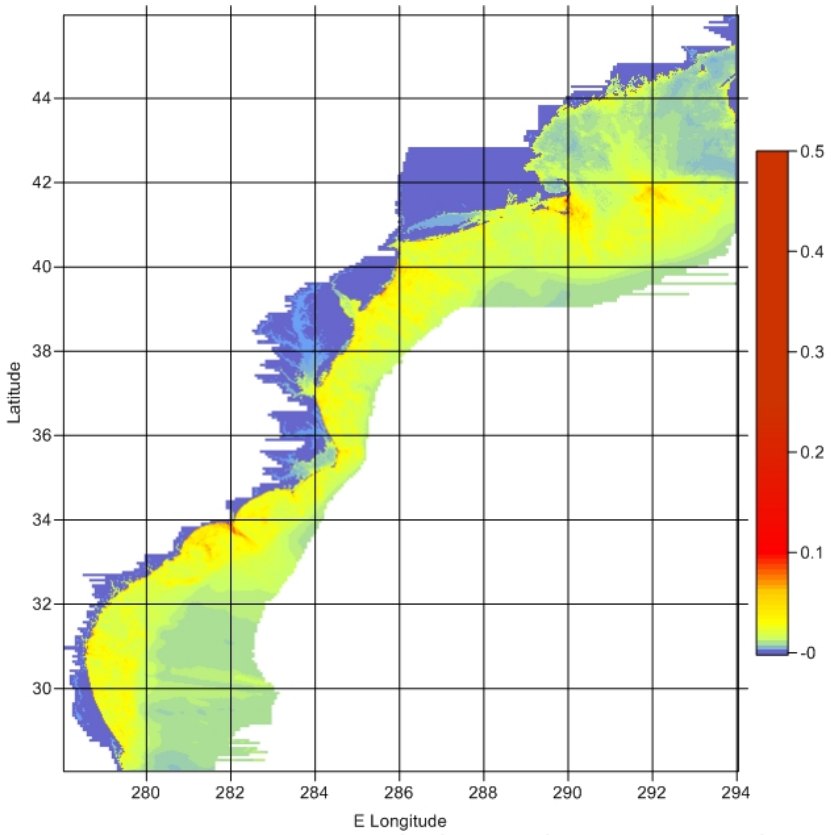

Figure II-2. Amplitude maximale de tsunami modélisée (grille à maille plus fine) à proximité de la côte atlantique des Etats-Unis (échelle en mètres - ATFM)

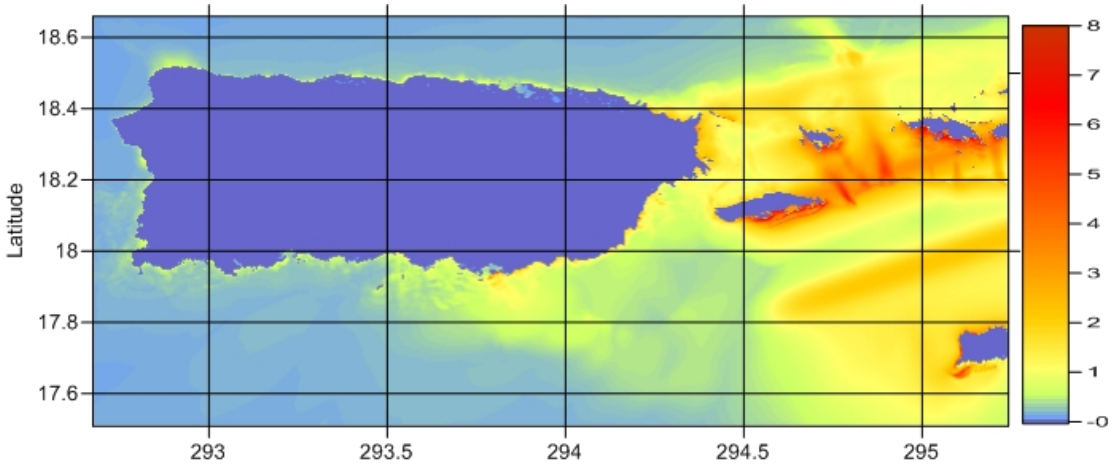

Figure II-3. Amplitude maximale de tsunami modélisée (sur une grille haute résolution) près de Porto Rico et des îles Vierges (échelle en mètres - ATFM)

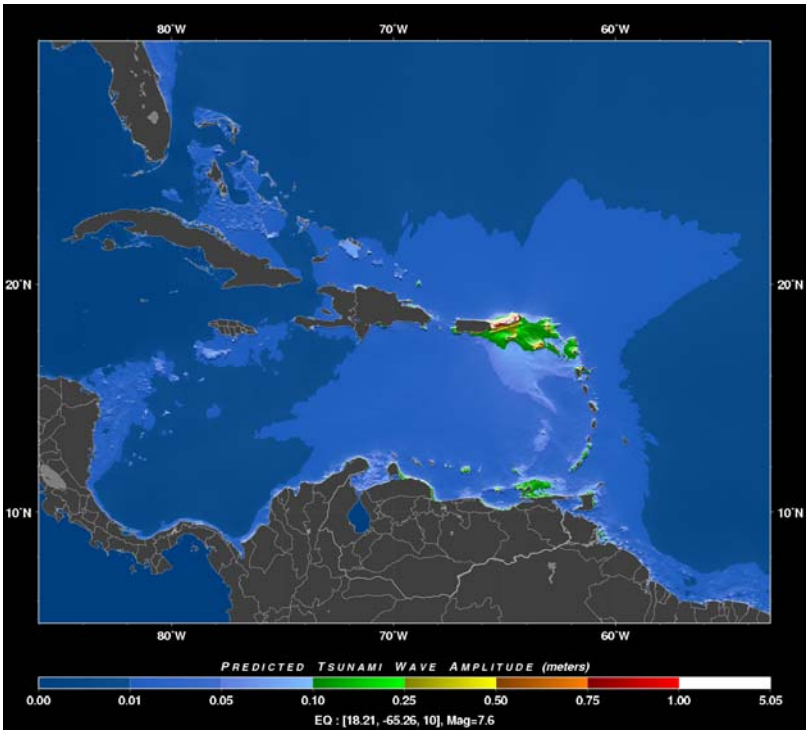

Figure II-4. Amplitude maximale du tsunami modélisée dans les Caraïbes (échelle en mètres - RIFT)

Emplacement	**Temps de parcours (heure : min)**	**Amp.max (mètres)**	**Premier effet**
Charlotte Amalie, IV	0 :01	2.7	élévation
Christiansted, IV	0 :01	2.5	retrait
	0 :01	0.95	retrait
Lameshur Bay, IV	0 :02	2.85	retrait
Limetree Bay, IV	0 :02	4.7	retrait
Virgin Gorda, IV britanniques	0 :03	1.4	retrait
Culebra, PR	0 :05	2.0	
St. John,IV	0 :07	0.26	élévation
Tortola, IV britanniques	0 :07	0.47	élévation
San Juan, PR	0 :12	0.59	élévation

Emplacement	**Temps de parcours (heure : min)**	**Amp.max (mètres)**	**Premier effet**
Mona Island, PR	0 :25	0.26	retrait
Magueyes Island, PR	0 :28	0.75	
D42407	0 :32	.025	retrait
Aquadilla, PR	0 :36	0.50	
Saint-Christophe	0 :44	1.07	retrait
Anguilla	0 :45	1.23	
Montserrat	0 :45	0.18	retrait
Mayaguez, PR	0 :47	0.50	
Basse Terre, Guadeloupe	0 :51	0.19	retrait
Cabo Engano, DR	0 :54	0.12	
Barbuda	0 :55	0.13	retrait
Bonaire	0 :55	0.07	
Roseau, Dominique	0 :55	0.23	retrait
Saint-Martin	1 :01	0.25	
Saint-Domingue	1 :02	0.18	
Fort-de-France, Martinique	1 :03	0.21	retrait
St Johns, Antigua	1 :03	0.24	
Sainte-Lucie	1 :05	0.11	retrait
Saint-Vincent	1 :14	0.78	
Curacao	1 :11	0.27	retrait
Aruba	1 :16	0.13	
Grand Turk, Turques et Caïques	1 :18	0.05	
St. Georges, Grenade	1 :24	0.54	retrait
Maiquetia, VE	1 :30	0.12	
Puerto Plata, DR	1 :30	0.04	élévation
La Guaira, VE	1 :31	0.15	retrait
Bridgetown, Barbade	1 :38	0.05	
Santa Marta, CO	1 :57	0.095	retrait
Barranqilla, CO	2 :01	0.11	
Bermudes	2 :05	0.09	retrait
Cumana, VE	2 :05	0.14	
Carthagène, CO	2 :18	0.02	retrait
Kingston, JA	2 :26	0.08	
Porlamar, VE	2 :29	0.26	
Myrtle Beach, FL	3 :02	0.08	élévation
Gibara, Cuba	3 :08	0.02	
Puerto Limon, CR	3 :11	0.04	retrait
Riohacha, CO	3 :18	0.10	
Punta Fijo, VE	3 :42	0.085	élévation
Port Au Prince, Haïti	3 :57	0.04	retrait
Baie de Guantanamo, Cuba	3 :58	0.035	
Golfo de Venezuela, VE	4 :20	0.02	retrait
Porlamar, VE	4 :21	0.04	
Duck, NC	4 :26	0.07	retrait
Trident Pier, FL	4 :29	0.06	
Montego Bay, JA	4 :35	~0.01	?

Emplacement	Temps de parcours (heure : min)	Amp.max (mètres)	Premier effet
Ocean City, MD	4 :54	0.11	retrait
Wrightsville, NC	5 :05	0.06	
Flagler Beach, FL	5 :06	0.075	élévation
Key West, FL		< 0.01	
Georgetown, Guyana	5 :12	0.04	
Atlantic City, NJ	5 :14	0.19	retrait
Sunset Beach, NC	5 :24	0.14	
Port-of-Spain	5 :24	~0.01	retrait
Springmaid Pier, SC	5 :36	0.06	
Oregon Inlet, SC	5 :44	0.02	élévation
Charleston, SC	5 :48	0.03	élévation
Nantucket Is., MA	6 :24	0.085	élévation
Providence, RI	7 :03	0.055	élévation

Tableau II-1: Prévision d'amplitude côtière fait pour l'événement (ATFM et RIFT). L'amplitude est l'élévation du tsunami au-dessus du niveau de la mer. L'amplitude ne prend pas en compte le soulèvement ou l'abaissement de l'emplacement dû au séisme. L'amplitude étant mesurée au large, les hauteurs sur le rivage pourraient être le double des valeurs des modèles de prévision

Tsunami Event

Date						Tsunami Cause		Tsunami Source Location				Tsunami Parameters			
Year	Mo	Dy	Hr	Mn	Sec	Val	Code	Country	Name	Latitude	Longitude	Max Water Height	Magnitude Abe	Magnitude Ida	Tsu Int	Warn Status
1867	11	18	18	45		4	1	USA TERRITORY	VIRGIN ISLANDS	18.100	-65.100	10.00		2.30		

Tsunami Runups

Addl Info	Doubtful Runup	Tsunami Runup Location						Tsunami Runup Measurements					Tsunami Runup Location Effects							
		Country	State/ Province/ Prefecture	Name	Latitude	Longitude	Distance from Source	Travel Time Hrs	Travel Time Min	Max Water Height	Max Inundation Distance	Type	Per	1st Mtn	Deaths Num	Deaths De	Injuries Num	Injuries De	Damage $Mill	Damage De	Houses Destroyed Num	Houses Destroyed De	Houses Damaged Num	Houses Damaged De
*		ANTIGUA AND BARBUDA		ANTIGUA: ST. JOHNS	17.193	-62.416	302			2.40		1												
*		ANTIGUA AND BARBUDA		BARBUDA: WEST COAST	17.717	-61.817	350			1.40		1												
*		BRITISH VIRGIN ISLANDS		PETER'S ISLAND	18.367	-64.633	58			1.20		1												
*		BRITISH VIRGIN ISLANDS		TORTOLA ISLAND: ROAD TOWN	18.414	-64.616	62			1.50	9.00	1		F						1		2		
*		DOMINICA		RUPERT'S BAY	15.500	-61.333	494			3.00		1												
*		GRENADA		GOUYAVE (CHARLOTTE TOWN)	12.167	-61.733	752			3.00		1								1				
*		GRENADA		SAINT GEORGE'S	12.015	-61.778	765			1.50		1		F										
*		GUADELOUPE		BASSE TERRE	16.000	-61.717	429			1.00		1												
*		GUADELOUPE		DESHAIES	16.317	-61.783	404			10.00		1		F						2				
*		GUADELOUPE		ILES DES SAINTES: FOND-DU-CIRE	15.867	-61.617	446			1.00		1								2				
*		GUADELOUPE		POINTE-A-PITRE	16.233	-61.533	432					1												
*		GUADELOUPE		SAINT BARTHELEMY ISLAND	17.900	-62.833	241					1								1				
*		GUADELOUPE		SAINT MARTIN	18.670	-63.067	224					1								1				
*		GUADELOUPE		SAINTE-ROSE	16.333	-61.700	411			10.00		1		F						2				
*		MARTINIQUE		MARTINIQUE	14.667	-61.000	581					1												
*		NETHERLANDS ANTILLES		SABA ISLAND	17.633	-63.233	204					1												
*		SAINT KITTS AND NEVIS		SAINT KITTS: BASSETERRE	17.300	-62.717	268				2.40	1		F										
*		SAINT LUCIA		LAVON, ANSE-LA-RAYE	13.883	-60.967	644			.90		1												
*		SAINT VINCENT AND THE GRENADINES		BEQUIA ISLAND: ADMIRALTY BAY	13.280	-61.250	676			1.80	146.00	1								1		2		
*		SAINT VINCENT AND THE GRENADINES		SAINT VINCENT	13.130	-61.200	693					1												
*		USA TERRITORY	PR	PUERTO RICO: ARROYO	17.983	-66.050	101			.90	40.00	1												
*		USA TERRITORY	PR	PUERTO RICO: BAHIA DE SAN JUAN	18.450	-66.117	114			.90		1		F										
*		USA TERRITORY	PR	PUERTO RICO: PLAYA DE FAJARDO	18.333	-65.633	62					1		F										
*		USA TERRITORY	PR	PUERTO RICO: VIEQUES	18.150	-65.450	37					1		F										
*		USA TERRITORY	PR	PUERTO RICO: YABUCOA	18.033	-65.883	83			1.37		1		F										
*		USA TERRITORY	VI	VIRGIN ISLANDS: ALTONA	18.341	-64.949	31				76.20	1								2		2		
*		USA TERRITORY	VI	VIRGIN ISLANDS: CHARLOTTE AMALIE	18.333	-64.917	32			6.00		1	10	F	12	1				2				
*		USA TERRITORY	VI	VIRGIN ISLANDS: CHISTIANSTED	17.767	-64.733	54				91.00	1		F										
*		USA TERRITORY	VI	VIRGIN ISLANDS: FREDERIKSTED	17.717	-64.883	48	0	12	7.60	76.00	1		F	5	1				1	20	1		
*		USA TERRITORY	VI	VIRGIN ISLANDS: GALLOWS BAY	17.600	-64.700	70					1								1	20	1		
*		USA TERRITORY	VI	VIRGIN ISLANDS: HASSEL ISLAND	18.300	-64.960	27			4.90		1			3	1								
*		USA TERRITORY	VI	VIRGIN ISLANDS: SABA ISLAND	18.341	-64.982	30					1			10	1								
*		USA TERRITORY	VI	VIRGIN ISLANDS: SAINT CROIX	17.750	-64.750	54			7.00		1												

Figure II-5. Données historiques relatives au tsunami de 1867 (NGDC)

Intergovernmental Oceanographic Commission
technical series

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EJERCICIO CARIBE WAVE 11
Un ejercicio de alerta de tsunami en el Caribe

Manual del participante

23 de marzo de 2011

Preparado por el Grupo Intergubernamental de Coordinación COI/UNESCO del Sistema de Alerta contra Tsunamis y otras Amenazas Costeras del Caribe y Regiones Adyacentes

UNESCO 2010

Colección Técnica de la COI Nº 93
París, noviembre de 2010
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1. ANTECEDENTES

El Ejercicio CARIBE WAVE 11/LANTEX se lleva a cabo para contribuir a las actividades de preparación para casos de tsunami en toda la región del Caribe. Los eventos recientes, como los que se produjeron en el Océano Índico en 2004 y en Samoa en 2009, y los terremotos y tsunamis ocurridos en 2010 en Haití y Chile, atestiguan la importancia de una planificación adecuada de la respuesta a los tsunamis.

Los datos de tsunamis históricos del Centro nacional de datos geofísicos (NGDC) de la Administración Nacional Oceánica y Atmosférica estadounidense (NOAA) indican que en los últimos 500 años se han observado en el Caribe más de 75 tsunamis con una fiabilidad superior a 1 (Figura 1). Estos representan aproximadamente un 7 a 10 por ciento de los tsunamis oceánicos del mundo. Todas las fuentes de tsunamis, a saber, terremotos, deslizamientos de tierras y erupciones volcánicas, han golpeado a la región. Desde 1842 por lo menos 3 510 personas fallecieron a causa de tsunamis en el Caribe. En los últimos años se ha registrado una explosión demográfica y un fuerte incremento de la afluencia de turistas en las costas caribeñas, lo que acentúa la vulnerabilidad de la región a los tsunamis. Además de estos últimos, la región tiene también una larga historia de terremotos destructivos. Los datos históricos demuestran que fuertes seísmos afectaron muchas veces a la región del Caribe en los últimos 500 años.

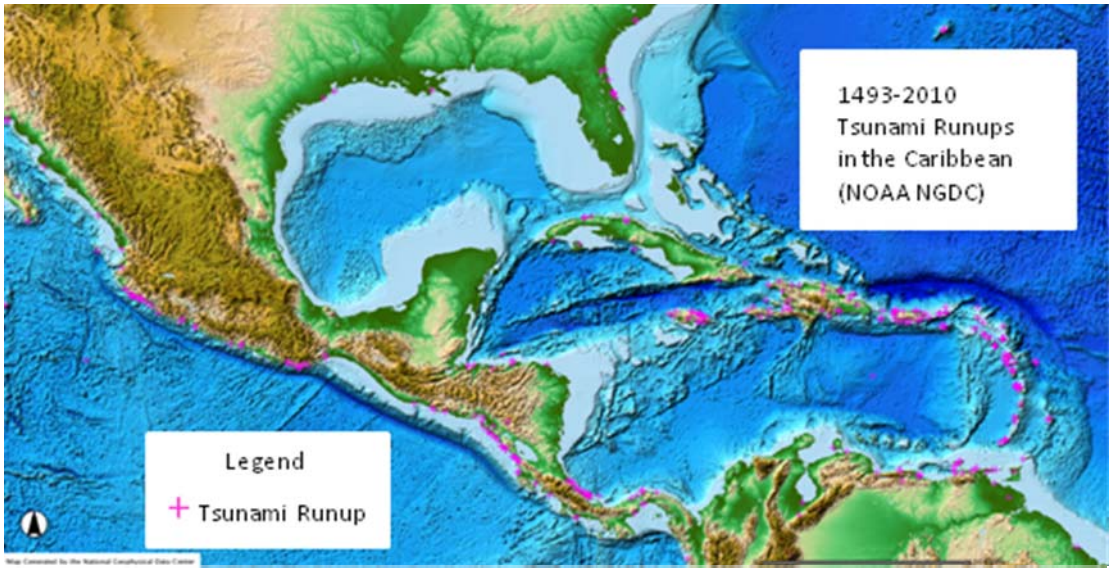

Figura 1. Mapa de las alturas máximas de inundaciones causadas por tsunamis en el Caribe, 1493-2010 (National Geophysical Data Center, http://www.ngdc.noaa.gov/hazards/tsu.shtml)

En la región existen múltiples segmentos de falla y rasgos submarinos que podrían ser fuente de tsunamis generados por terremotos y deslizamientos de tierras (Figura 2). El perímetro de la placa del Caribe está bordeado por nada menos que cuatro grandes placas (América del Norte, América del Sur, Nazca y Cocos). La subducción se produce a lo largo de los márgenes oriental y nororiental atlánticos de la placa del Caribe. El norte de América del Sur, el este de América Central, la cadena montañosa y el graben de las Islas Caimán y el límite de la placa septentrional se caracterizan por fallas normales, transformantes y de desgarre. (Tarr et al, 2007).

En el Caribe nororiental, la Fosa de Puerto Rico, aproximadamente paralela a la costa septentrional de Puerto Rico y situada a unas 75 millas de ésta, tiene unos 900 kilómetros de largo (560 millas) y 100 kilómetros (60 millas) de ancho (Figura 3). A 8 350 metros

(27 362 pies) debajo de la superficie del mar, la fosa es el punto más profundo del Océano Atlántico. La Fosa de La Española es paralela a la costa septentrional de la República Dominicana y Haití, tiene 550 kilómetros (344 millas) de largo y sólo 4 500 metros (14 764 pies) de profundidad. Las Fosas de las Islas Vírgenes y Anegada atraviesan el arco de las Antillas entre el norte de las Islas Vírgenes y Santa Cruz y las Antillas Menores. Se podrían generar tsunamis a lo largo de estas distintas estructuras, pero la dirección y el tamaño de las olas dependerían de muchos factores, entre otros el lugar donde se haya producido el seísmo. En 1867, se produjo en la cuenca un terremoto de magnitud 7,3 que generó un tsunami cuya altura de ola fue de cerca de 7,6 metros en Santa Cruz (Islas Vírgenes de los Estados Unidos); 10 metros en Deshaies, Guadalupe; y se observó en el noreste y el este del Caribe (Reid y Taber, 1920; Watlington, 1997). Se utilizará este fenómeno como base para este Ejercicio.

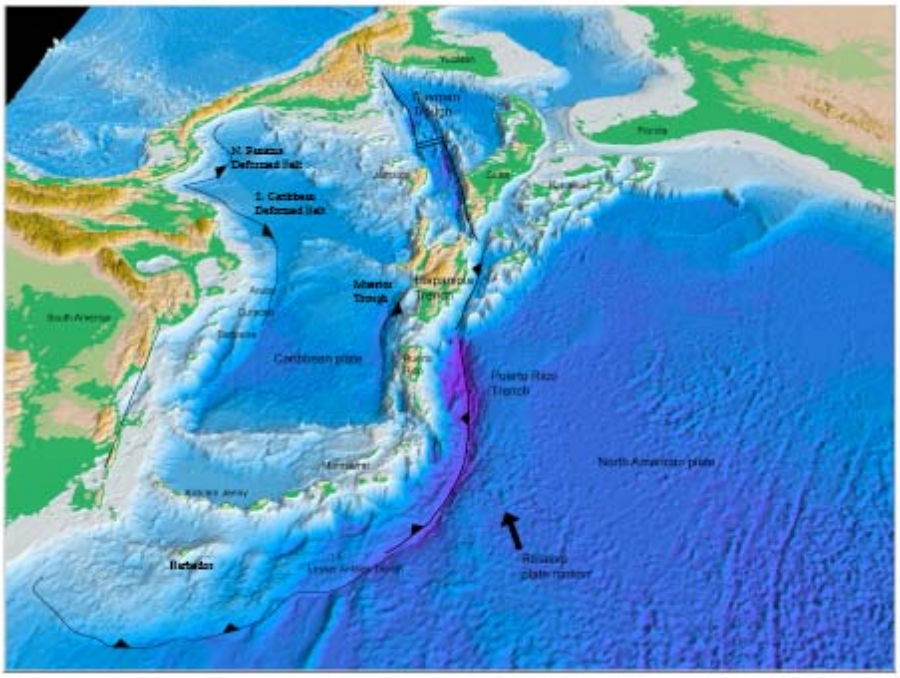

Figura 2. Características tectónicas del Caribe (ten Brink et al., 2008)

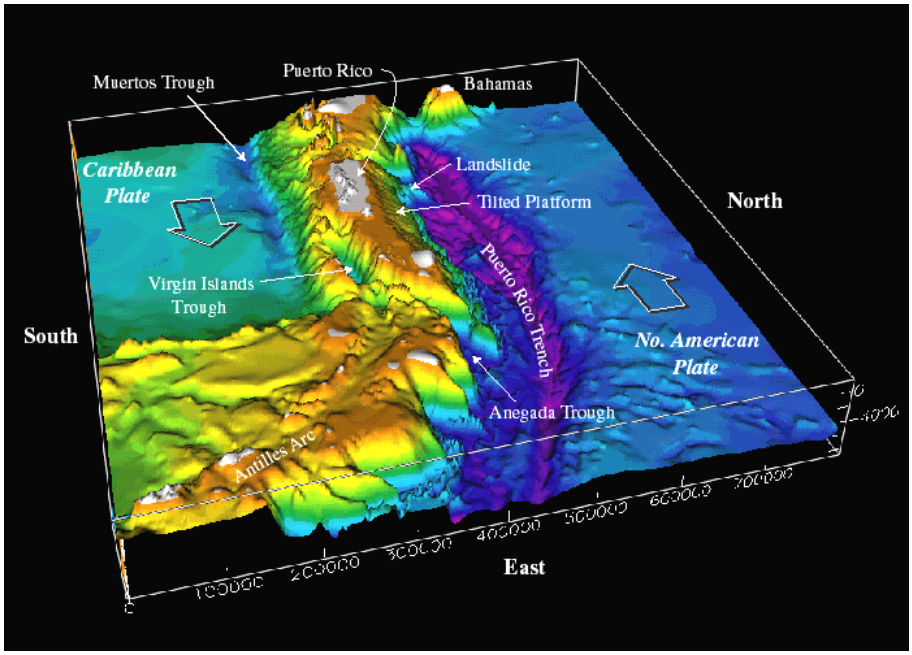

Figura 3. Características tectónicas del noreste del Caribe (ten Brink et al., 2008)

Actualmente presta servicios de alerta contra tsunamis en el Caribe el Centro de Alerta contra los Tsunamis de Alaska y la Costa Occidental (WCATWC) situado en Palmer (Alaska) para Puerto Rico y las Islas Vírgenes, mientras que el Centro de Alerta contra los Tsunamis en el Pacífico (PTWC) de Ewa Beach (Hawai) los proporciona a las regiones del Caribe que no son estadounidenses. Estos Centros transmiten productos sobre tsunamis a la región aproximadamente de 2 a 10 minutos después de que se produzca un terremoto. Los productos del WCATWC incluyen alertas, advertencias, avisos y boletines informativos, en tanto que los del PTWC comprenden información sobre tsunamis y avisos. Entre los principales receptores de los mensajes de un Centro de Alerta contra Tsunamis figuran los puntos focales de alerta contra los tsunamis de cada país, las oficinas meteorológicas, los centros de alerta y de operaciones de emergencia de cada Estado o territorio, los guardias costeros nacionales, y contactos militares. Estos organismos difunden los mensajes a las personas que podrían ser afectadas por un tsunami. La Red Sísmica de Puerto Rico (RSPR) de la Universidad de Puerto Rico en Mayagüez, el Instituto Nicaragüense de Estudios Territoriales (INETER) en Nicaragua, la Fundación Venezolana de Investigaciones Sismológicas (FUNVISIS) en Venezuela, y otras entidades nacionales y regionales también suministran información sobre los terremotos y tsunamis a las regiones de su competencia.

El Grupo Intergubernamental de Coordinación del Sistema de Alerta contra los Tsunamis y otras Amenazas Costeras en el Caribe y Regiones Adyacentes (ICG/CARIBE-EWS) de la Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO), la Agencia de Manejo de Emergencias y Desastres del Caribe (CDEMA), el Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (CEPREDENAC), la NOAA, y el programa nacional estadounidense de atenuación del riesgo de tsunami (NTHMP) proporcionan el marco de referencia para este Ejercicio, a fin de que los encargados de responder a emergencias de todo el Caribe pongan a prueba y actualicen los planes de respuesta a tsunamis. Los elevados grados de vulnerabilidad y amenaza que afectan a muchas naciones caribeñas deberían constituir un fuerte incentivo para que las autoridades locales se preparen para casos de tsunami.

Este Ejercicio comprenderá simulaciones de mensajes de alerta, aviso y advertencia de los Centros de Alerta contra Tsunamis sobre la base de un terremoto hipotético de magnitud 7,6 acaecido cerca de las Islas Vírgenes de los Estados Unidos, en las coordenadas 18º2 N, 65º3 O. Ejercicios como éste contribuirán a lograr que las costas caribeñas estén preparadas para responder a un tsunami peligroso. Ejercicios similares realizados recientemente en las cuencas del Pacífico y del Atlántico han resultado eficaces para fortalecer los niveles de preparación de los organismos encargados de la gestión de emergencias.

2. CONCEPTO DEL EJERCICIO

2.1 FINALIDAD

La finalidad del Ejercicio es mejorar la eficacia del sistema de alerta contra los tsunamis en las costas del Caribe. Brinda la oportunidad de que los organismos encargados de la gestión de emergencias pongan a prueba sus medios de comunicación operativos, examinen sus procedimientos de respuesta a los tsunamis y promuevan la preparación para casos de tsunami. La experimentación periódica de los planes de respuesta es esencial para mantener la preparación para casos de emergencia. Esto es particularmente válido para los tsunamis, que son fenómenos poco frecuentes pero con importantes repercusiones. Se alienta a participar en el Ejercicio a todas las entidades del Caribe que se encargan de la gestión de situaciones de emergencia.

2.2 OBJETIVOS

Cada entidad puede elaborar sus propios objetivos para el Ejercicio, en función de su nivel de participación en el escenario. Los siguientes son los objetivos primordiales del Ejercicio:

1. Asegurar la transmisión de mensajes de los Centros de Alerta contra Tsunamis a los puntos focales de alerta contra los tsunamis (TWFP), y de estos primeros contactos a los organismos encargados de la gestión de emergencias.
2. Poner a prueba los planes de respuesta a tsunamis de las entidades encargadas de las situaciones de emergencia en el Caribe que han elaborado planes de esa índole, y constituir un catalizador para los países y los organismos que no los hayan formulado.
3. Permitir que las entidades encargadas de la gestión de emergencias, los puntos focales de alerta contra los tsunamis (TFWP) y los contactos nacionales sobre tsunamis examinen, debatan y evalúen las diversas opciones de comunicación para recibir y difundir mensajes sobre tsunamis.
4. Posibilitar que las entidades encargadas de la gestión de emergencias, los puntos focales de alerta contra los tsunamis (TFWP) y los contactos nacionales sobre tsunamis examinen, debatan y evalúen posibles medidas de respuesta y eventuales problemas.
5. Definir los procesos para emitir notificaciones locales de fin de alerta.

2.3 TIPO DE EJERCICIO

El Ejercicio deberá realizarse de modo que las comunicaciones y la adopción de decisiones en distintos niveles organizativos se pongan a prueba y se lleven a cabo sin perturbar o alarmar al público en general. Algunas localidades, empero, pueden si lo desean extender el Ejercicio hasta el nivel de experimentación de los sistemas locales de notificación, como el Sistema de Alerta de Emergencias, sirenas o altavoces.

Los ejercicios estimulan la elaboración, enseñanza, experimentación y evaluación de planes para casos de desastre y procedimientos normalizados de operaciones. Los participantes pueden utilizar sus propios simulacros pasados relacionados con peligros múltiples (por ejemplo, inundación, huracán, tsunami, terremoto, etc.) como marco para realizar el CARIBE WAVE 11/LANTEX 11.

Los ejercicios pueden realizarse con distintas escalas de magnitud y grados de complejidad. A continuación se presentan ejemplos de tipos de ejercicios realizados por organismos encargados de la gestión de situaciones de emergencia:

1. Orientation Exercise (Seminar): Ejercicio de orientación (Seminario): un ejercicio de orientación sienta las bases de un programa de ejercicio integral. Es un evento planificado, preparado para reunir a personas y funcionarios que cumplen una función o tienen interés en la planificación de respuestas a peligros múltiples, la solución de problemas, la elaboración de procedimientos normalizados de operaciones y la integración y coordinación de recursos. Un ejercicio de orientación tendrá una meta específica y objetivos escritos, y dará lugar a un Plan de Acción acordado.
2. Simulacro (“drill”): el simulacro es una actividad programada en la que se ponen a prueba, se incrementan y/o mantienen competencias relativas a un procedimiento único o limitado de respuesta a una situación de emergencia. Los simulacros atañen generalmente a la respuesta operacional de una sola dependencia o entidad. Pueden incluir notificaciones internas y/o actividades sobre el terreno.

3. Ejercicio de simulación (“tabletop”): la simulación es una actividad planificada en que se presentan situaciones de emergencia simuladas a las autoridades locales, funcionarios clave y entidades responsables de la gestión de desastres. Suele ser informal, en un ambiente de sala de reuniones, y tiene por objeto suscitar un debate constructivo entre los participantes. Estos examinarán los problemas e intentarán resolverlos sobre la base de planes y procedimientos, si existen. Se alienta a los participantes a analizar a fondo las decisiones haciendo hincapié en la solución de problemas paso a paso, en lugar de la adopción de decisiones rápida y en tiempo real. Un ejercicio de simulación debe tener metas específicas, objetivos y una descripción del escenario (véase el Apéndice I en el que figura un ejemplo de esquema de ejercicio de simulación).

4. Ejercicio funcional: un ejercicio funcional es una actividad planificada destinada a poner a prueba y evaluar las capacidades organizativas. También se utiliza para evaluar la capacidad de un sistema comunitario de gestión de situaciones de emergencia ensayando el Plan de Operaciones de Emergencia. Se basa en la simulación de una situación de emergencia realista que incluye una descripción de la situación (narración) con intercambios entre los jugadores y los simuladores. El ejercicio funcional brinda a los jugadores (responsables de la adopción de decisiones) una experiencia totalmente simulada de la situación frente a un grave desastre. Debe realizarse en el lugar de coordinación apropiado (es decir, un centro de operaciones de emergencia, un centro de mando para situaciones de emergencia, un puesto de comando, un centro de control principal, etc.) y activar a todos los miembros adecuados designados en el Plan. Deberían participar organismos internos y externos (gobierno, sector privado y entidades voluntarias). Requiere jugadores, supervisores, simuladores y evaluadores. El intercambio de mensajes se simulará y el equipo de control lo insertará para generar respuestas/medidas por parte de los jugadores, con las exigencias del tiempo real. Puede incluir o no evacuaciones de población. Un ejercicio funcional debe tener metas específicas, objetivos y una descripción del escenario.

5. Ejercicio integral: un ejercicio integral es la culminación de un programa gradual de ejercicios que se ha desarrollado junto con la capacidad de la comunidad de efectuar ejercicios. Un ejercicio integral es una actividad planificada en un entorno “difícil” que abarca la mayoría de las funciones de la gestión de emergencias. Este tipo de ejercicio requiere la movilización y el despliegue reales del personal y los recursos apropiados que se necesitan para demostrar las capacidades operacionales. Es necesario activar a los Centros de Operaciones de Emergencia y otros centros de mando. Un ejercicio integral es el tipo de ejercicio de mayor envergadura, más costoso y más complejo. Puede incluir o no evacuaciones de población.

Ejemplo de calendarios para distintos tipos de ejercicios

Tipo	Periodo de planificación	Duración	Observaciones
Ejercicio de orientación	2 semanas	1 día	Grupos individuales o mixtos
Simulacro	2 días	1 día	Generalmente grupos técnicos individuales
Ejercicio de simulación	2 semanas	1-3 días	Uno o varios organismos
Ejercicio funcional	1-2 meses	1-5 días	Participación de varios organismos
Ejercicio integral	2-6 meses	1 día/ semana	Participación de varios organismos

3. ESQUEMA DEL EJERCICIO

3.1 GENERALIDADES

El origen del tsunami se basa de modo aproximado en observaciones relativas al terremoto y al tsunami ocurridos en las Islas Vírgenes en 1867. La información de referencia sobre el evento de 1867 proviene de: “Disaster and Disruption in 1867: Hurricane, Earthquake, and Tsunami in the Danish West Indies” (Watlington y Lincoln, 1997), “Caribbean Tsunamis” (O’Laughlin & Lander, 2003), el sitio web de la Universidad del Sur de California (USC) sobre los tsunamis (véase más adelante), “The 1867 Virgin Island Tsunami” (Zahibo, 2003), el informe de la USGS para la Nuclear Regulatory Commission: “Evaluation of Tsunami Sources with the Potential to Impact the U.S. Atlantic and Gulf of Mexico Coasts” (ten Brink et al., 2008), y “Tsunami Simulations of the 1867 Virgin Island Earthquake: Constraints on Epicenter Location and Fault Parameters” (Barkan y ten Brink, 2010). Los mapas de inundación por tsunami de Puerto Rico incluían la Fosa de las Islas Vírgenes/Anegada sobre la base de hipótesis inspiradas en “Mode of Faulting in the Local Zone of Puerto Rico (LZPR)”, por Huérfano Moreno (2003). Puede encontrarse un breve resumen del evento de 1867 en el sitio web del Grupo de Investigación sobre Tsunamis de la Universidad del Sur de California(USC) en http://www.usc.edu/dept/tsunamis/caribbean/webpages/1867viindex.html. El epicentro histórico aproximado (basado en información de la USC) se indica en la Figura 4, más adelante.

Los modelos del tsunami se calcularon utilizando el modelo de pronóstico de tsunami de Alaska (ATFM) del WCATWC y el modelo de inundación rápida y pronóstico de tsunami (RIFT) del PTWC para elaborar los efectos esperados en toda la región. Los modelos indicaron un importante tsunami en el Caribe oriental, con poco impacto fuera del Caribe. Sobre la base de los modelos, el Ejercicio se limitó a la región del Caribe, y no incluye otras zonas que se hallan bajo la responsabilidad de los centros de alerta contra tsunamis en el Atlántico o el Golfo de México. Los modelos del tsunami se basan en el evento de 1867 como doble fuente de terremotos en la Fosa de las Islas Vírgenes, con aproximadamente 60 km entre los epicentros y 5 minutos entre las horas de inicio. Los parámetros de las fuentes son los siguientes:

Fuente 1:

Hora = 13.00 UTC, Mw 7,6, epicentro en {18º21 N, 65º26 O}, rumbo (strike) = 71o, buzamiento (dip), 8o, ángulo de deslizamiento (slip) 90o.

Fuente 2

Hora = 13.05 UTC, Mw 7,6, epicentro en {18º36 N, 64º73 O}, rumbo = 71o, buzamiento, 8o, ángulo de deslizamiento 90o.

Las fórmulas del desplazamiento del fondo marino se utilizaron para generar los dos levantamientos iniciales, y el ATFM calculó la propagación del tsunami desde esas fuentes para producir amplitudes previstas a lo largo de la costa atlántica estadounidense y la del Golfo de México, así como en todo el Caribe. En el Apéndice II se indican los resultados del modelo.

Figura 4. Ubicación aproximada del terremoto y tsunami del 18 de noviembre de 1867

Inicialmente, el WCATWC emite una alerta de tsunami que incluye Puerto Rico y las Islas Vírgenes, mientras que el PTWC emite un aviso de tsunami regional. La costa oriental estadounidense y el Golfo de México están incluidos en el mensaje del WCATWC a título de mera información, ya que allí la amenaza de tsunami es mínima. Más adelante se definen los productos que emitirán los Centros de Alerta contra Tsunamis durante este Ejercicio (Obsérvese que los productos del PTWC difieren de los del WCATWC debido a los requisitos establecidos por el ICG/CARIBE-EWS):

Centro de Alerta contra los Tsunamis de Alaska y la Costa Occidental

Alerta de tsunami *(Tsunami Warning)* – Una alerta de tsunami se emite cuando es inminente o se espera un tsunami potencial con una importante y extensa inundación. La alerta advierte al público de la posibilidad de una amplia y peligrosa inundación de las costas acompañada por poderosas corrientes, que puede durar varias horas después de la llegada de la primera ola. Las alertas también anuncian a los responsables de la gestión de emergencias que deben tomar medidas en toda la zona amenazada por el tsunami. Las medidas apropiadas que deben adoptar los responsables locales pueden incluir la evacuación de zonas costeras bajas, y el desplazamiento de buques a aguas profundas cuando tienen tiempo de hacerlo sin correr peligro. Las alertas pueden actualizarse, ajustarse geográficamente, disminuirse o cancelarse. Para que se pueda dar la alarma lo más pronto posible, las primeras alertas se basan generalmente sólo en información sísmica.

Advertencia de tsunami (*Tsunami Advisory*) – Una advertencia de tsunami se emite debido a la amenaza de un tsunami potencial que puede producir fuertes corrientes u olas peligrosas para quienes están en el agua o cerca de ella. Las zonas costeras históricamente expuestas a daños causados por fuertes corrientes inducidas por tsunamis son las que corren mayor peligro. La amenaza puede perdurar varias horas después de la llegada de la primera ola, pero en el caso de una advertencia no se espera una importante y extensa inundación en la zona afectada. Las medidas adecuadas que han de tomar los funcionarios locales pueden incluir el cierre de las playas, la evacuación de puertos y marinas, y el desplazamiento de buques a aguas profundas cuando tienen tiempo de hacerlo sin correr peligro. Una advertencia suele actualizarse para mantenerla, ampliar o reducir las zonas afectadas, convertirla en alerta, o cancelarla.

Centro de Alerta contra los Tsunamis en el Pacífico

Aviso de tsunami (*Tsunami Watch*) – Los avisos son emitidos por los Centros de Alerta contra Tsunamis sobre la base de información sísmica, sin confirmación de que esté en curso un tsunami destructivo. Se emiten para proporcionar una prealerta a zonas que podrían ser afectadas por las olas de un tsunami destructivo. Los avisos se actualizan por lo menos cada hora para mantenerlos vigentes, ampliar su cobertura, convertirlos en alerta, o cancelar la alarma. Un Aviso para una zona determinada puede incluirse en el texto del mensaje que difunde una Alerta para otra zona.

Boletín de información sobre tsunami (*Tsunami Information Bulletin*) – Se emite un texto para comunicar que se ha producido un seísmo y advertir acerca de sus posibilidades de generar un tsunami. En la mayoría de los casos, un Boletín de Información sobre Tsunami indica que no hay amenaza de tsunami destructivo, y se utiliza para impedir evacuaciones innecesarias ya que el terremoto puede haberse percibido en las zonas costeras. Un Boletín de Información sobre Tsunami puede, en situaciones apropiadas, anunciar la posibilidad de un tsunami destructivo local. Puede emitirse un Boletín suplementario si se recibe información adicional importante, como una medición del nivel del mar que dé un indicio de tsunami. Un Boletín de Información sobre Tsunami también puede convertirse en aviso, advertencia o alerta, según proceda.

Los Centros de Alerta contra Tsunamis no difundirán mensajes en directo en canales de radio y televisión fuera de un primer mensaje ficticio para iniciar el ejercicio a las 13.02 UTC el 23 de marzo de 2011. En cambio, los mensajes de estos Centros se enviarán por correo electrónico y por fax a determinados destinatarios que han pedido una difusión en directo a lo largo del evento. El contenido del mensaje ficticio figura en el Apéndice III. El mensaje ficticio indicará que los participantes en el Ejercicio deben remitirse al primer mensaje que figura en el presente manual. A partir de ese momento, deben seguir el programa presentado en el Cuadro 1 para buscar los nuevos mensajes si no los reciben por correo electrónico o por fax. El Cuadro 1 es el cronograma de los mensajes que enviarían los Centros de Alerta contra Tsunamis si se produjera un evento real, y los responsables de la gestión de emergencias pueden utilizarlo para programar la cronología. Los mensajes de alerta (que figuran en el Apéndice IV) abarcan un periodo de 5 horas, aunque en un evento real durarían probablemente más. Los códigos identificadores (ID) de la Organización Meteorológica Mundial (OMM) y del Advanced Weather Interactive Processing System (AWIPS) [sistema interactivo avanzado de procesamiento de la información meteorológica] utilizados en el mensaje ficticio se indican en el Cuadro 2.

Cuando se produce realmente un evento, el WCATWC emite dos productos oficiales cada vez que se emite un mensaje. El primero (los que figuran en el Apéndice IV) se conoce como mensaje estándar. Es un mensaje dividido en segmentos que incluye las zonas codificadas por los Servicios Meteorológicos Nacionales, el tiempo esperado de arribo de la primera ola [Valid Time Event Codes] (VTEC), y su nivel de amenaza en la sección inferior del mensaje. La segmentación se utiliza para los sistemas de procesamiento automatizados que analizan los productos de los Servicios Meteorológicos Nacionales. En el mensaje estándar también se indican las horas de llegada previstas. El segundo producto se conoce como mensaje público. Este mensaje no está dividido en segmentos y está escrito en forma no tabular, fácil de leer. Los productos contienen la misma información básica. Los organismos de gestión de emergencias utilizan generalmente el producto estándar para la respuesta a una alerta, ya que contiene información más completa. El WCATWC también difunde productos gráficos y electrónicos complementarios en su sitio web. Ejemplos de éstos figuran en el Apéndice V.

Los participantes pueden decidir aplicar sus propios cronogramas para alcanzar sus propios objetivos. Por ejemplo, un determinado Supervisor del Ejercicio de un organismo de gestión de emergencias puede elegir integrar los boletines de los Centros de Alerta contra Tsunamis

en el Ejercicio en el momento de su elección, o bien ponerlos en sobres en los que escribirá la hora en que debe abrirse cada uno, con un juego de sobres para cada organismo participante clave. Los mensajes, presentados en el Apéndice IV, facilitarán este método. Para este Ejercicio, además del mensaje ficticio, el WCATWC y el PTWC enviarán los mensajes por correo electrónico y por fax a los participantes que hayan solicitado este servicio.

Los organismos de gestión de emergencias podrán modificar las horas de llegada estimadas y/o las amplitudes de la ola para adaptarlas a su ejercicio –por ejemplo, decidir que el tsunami llegará antes y que su amplitud será mayor. También se alientan otras contribuciones al Ejercicio, como informes sobre los daños causados por el tsunami.

3.2 PLAN RECTOR (GUION DEL EJERCICIO)

Cuadro 1: Cronología del escenario

Tsunami generado por un terremoto de magnitud 7,6 con epicentro en 18º2 N, 65º3 O que ocurrió el 23 de marzo de 2011 a las 13.00 UTC y un segundo terremoto cercano que se produjo 5 minutos después. La primera alerta se difunde a las 13.02 UTC.

Fecha (UTC)	Hora (UTC)	Mensaje del WCATWC				Mensaje del PTWC			
		#	Tipo	Ficticio	Correo electrónico	#	Tipo	Ficticio	Correo electrónico
03/23/2011	13.00		- - - - - - Se produce el seísmo- - - - -						
03/23/2011	13.02	01	Alerta	Sí	Sí	01	Aviso	Sí	Sí
03/23/2011	13.32	02	Alerta	No	Sí				
03/23/2011	14.01	03	Alerta	No	Sí	02	Aviso	No	Sí
03/23/2011	14.31	04	Alerta	No	Sí				
03/23/2011	15.00	05	Alerta	No	Sí	03	Aviso	No	Sí
03/23/2011	15.30	06	Alerta	No	Sí				
03/23/2011	16.01	07	Adv	No	Sí	04	Aviso	No	Sí
03/23/2011	16.30	08	Adv	No	Sí				
03/23/2011	17.01	09	Can	No	Sí	05	Aviso	No	Sí
03/23/2011	18.02					06	Can	No	Sí

El mensaje ficticio inicial se difundirá por todos los canales de difusión habituales de los Centros de Alerta contra Tsunamis, tal como se indica en el Cuadro 2. Se emite para poner a prueba las comunicaciones con los organismos de gestión de emergencias y los Puntos focales de alerta contra los tsunamis, e iniciar el Ejercicio. Todos los mensajes se enviarán a los destinatarios que figuren en una lista especial de correo electrónico para transmitir los mensajes en tiempo real a las entidades que soliciten este servicio. Para solicitarlo, se ruega contactar con Christa von Hillebrandt (su dirección figura en la sección 3.5) para comunicarle el nombre de su organismo y la dirección electrónica.

Tipos de mensaje de los Centros de Alerta contra Tsunamis:

Alerta	Alerta de tsunami
Adv	Advertencia de tsunami
Aviso	Aviso de tsunami
Can	Cancelación

Ficticio:

Sí	Mensaje ficticio emitido
No	Mensaje ficticio no emitido

Correo electrónico:

Sí	Mensaje difundido a la lista especial de correo electrónico
No	Mensaje no difundido a la lista especial de correo electrónico

Cuadro 2: Tipos de productos

Tipos de productos emitidos para el mensaje ficticio, con sus métodos de transmisión:

Centro	ID OMM	ID AWIPS	NWWS	SMT	EMWIN	Fax	Correo electrónico
WCATWC	WEXX20 PAAQ	TSUAT1	Sí	Sí	Sí	Sí	Sí
PTWC	WECA41 PHEB	TSUCAX	Sí	Sí	Sí	Sí	Sí

NWWS NOAA Weather Wire Service [red de telecomunicaciones de la NOAA]
GTS Sistema Mundial de Telecomunicación
EMWIN Red de Información Meteorológica para Administradores de Situaciones de Emergencia

3.3 MEDIDAS EN CASO DE EVENTO REAL

En caso de que se produzca un evento real durante el Ejercicio, los Centros de Alerta contra Tsunamis emitirán sus mensajes habituales al respecto. Se dará absoluta prioridad a esos mensajes, y los Centros de Alerta decidirán si envían el mensaje ficticio y mensajes por correo electrónico a destinatarios escogidos. Pequeños seísmos que sólo den lugar a un Boletín de Información sobre Tsunami no interrumpirán el Ejercicio. Toda la documentación y la correspondencia relacionadas con este Ejercicio llevarán claramente la mención "**CARIBE WAVE 11/ LANTEX 11**" y "**Ejercicio"**.

3.4 PROCEDIMIENTO EN CASO DE FALSA ALARMA

Cada vez que se realiza un ejercicio de respuesta a un desastre, existe la posibilidad de que el público o los medios de comunicación interpreten que el evento es real. Todas las entidades participantes deberían establecer procedimientos para atender las preocupaciones de la población o de los órganos informativos relacionadas con este Ejercicio en caso de interpretación errónea.

3.5 RECURSOS

Si bien los organismos de gestión de emergencias recibirán por anticipado el anuncio del Ejercicio y pueden elegir dedicarle especialmente un turno para permitir que las actividades básicas esenciales sigan su curso sin interrupción, se pide asignar niveles de recursos realistas para poner de manifiesto algunos de los problemas que tienen probabilidades de surgir ante un evento real.

Las preguntas sobre el Ejercicio pueden enviarse a:

Persona	Teléfono #	Correo electrónico
Lorna Inniss, Presidenta	246-228-5950	linniss@coastal.gov.bb
Francisco Garcés, Vicepresidente	58-212-2575153	fgarces@funvisis.gob.ve
Frederique Martini, Vicepresidenta	Frederique.MARTINI@developpement-durable.gouv.fr	
Christa von Hillebrandt, Vicepresidenta; Responsable NWS CTWP Manager	787-833-8433	christa.vonh@noaa.gov
Emilio Talavera, Presidente GT	505-22492761	emilio.talavera@gf.ineter.gob.ni
Aurelio Mercado, Presidente GT2	787-265-5461	aurelio.mercado@upr.edu
Rafael Mojica, Presidente GT3	787-253-4586	rafael.mojica@noaa.gov
Dimas Alonso, Presidente GT4	504-2290606 x401	alonzoaguadesastres@yahoo.com

Persona	Teléfono #	Correo electrónico
Bernardo Aliaga, Secretario Técnico	33-1-45683980	b.aliaga@unesco.org
Jeremy Collymore, ex Director CDEMA	246-425-0386	Jeremy.Collymore@cdema.org
Walter Wintzer, CEPREDENAC	502-2362-1981-83	wwintzer@sica.int
Ivan Morales, CEPREDENAC	502-2362-1981-83	imorales@sica.int
Melinda Bailey, Serv. Meteorológico Nacional, Región Sur	817-978-1100x107	melinda.bailey@noaa.gov
Wilfredo Ramos, Rep. PREMA	787-724-0124	wramos@aemead.gobierno.pr
Jacqueline Heyliger Rep.VITEMA	340-773-2244	jjheyliger@yahoo.com
Paul Whitmore Director WCATWC	907-745-4212	paul.whitmore@noaa.gov
Bill Knight TWSO WCATWC	907-745-4212	william.knight@noaa.gov
James Waddell Rep. WCATWC	907-745-4212	james.waddell@noaa.gov
Charles McCreery Director PTWC	808-689-8207	charles.mccreery@noaa.gov
Stuart Weinstein TWSO PTWC	808-689-8207	stuart.weinstein@noaa.gov
Gerard Fryer Rep. PTWC	808-689-8207	gerard.fryer@noaa.gov
Víctor Huérfano Director PRSN	787-833-8433	victor@prsn.uprm.edu

3.6 DISPOSICIONES RELATIVAS A LOS MEDIOS DE COMUNICACIÓN

Una de las ventajas de la realización de ejercicios es que brinda la ocasión de generar conciencia del tema del Ejercicio. Puede que numerosos residentes de las costas del Caribe no sepan que existe un sistema de alerta contra los tsunamis en su región, y menos aún cuál es la respuesta adecuada. Las comunidades pueden desear invitar a sus órganos informativos locales a participar en el Ejercicio a fin de sensibilizar a la población local sobre el peligro de los tsunamis. En el Apéndice VI figura un ejemplo de comunicado de prensa que puede adaptarse en función de las necesidades.

La NOAA difundirá un comunicado de prensa varios días antes del Ejercicio a fin de describirlo y explicar su finalidad.

4. EVALUACIÓN POSTERIOR AL EJERCICIO

Se invita a todos los organismos participantes a proporcionar un breve comentario después de realizado el ejercicio. Este comentario ayudará al ICG/CARIBE-EWS, el NTHMP y la NOAA a evaluar el CARIBE WAVE 11/LANTEX 11 y preparar ejercicios ulteriores, así como a los organismos interesados a documentar las enseñanzas extraídas.

Se ruega hacer llegar el comentario posterior al Ejercicio a más tardar el 11 de abril de 2011 al sitio web del NTHMP en:
http://nthmp.tsunami.gov/exercise2011.php.

5. REFERENCIAS

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Apéndice I. EJEMPLO DE EJERCICIO DE SIMULACIÓN

Etapas de la preparación del ejercicio de simulación
Fuente: Oficina de Servicios de Emergencia de California

La simulación es una actividad planificada en que se presentan situaciones de emergencia simuladas a las autoridades locales, funcionarios clave y entidades responsables de la gestión de desastres. Suele ser informal, transcurrir sin prisas, en un ambiente de sala de reuniones, y tiene por objeto suscitar un debate constructivo entre los participantes para evaluar planes, políticas y procedimientos. Los participantes examinarán los problemas e intentarán resolverlos sobre la base de planes y procedimientos, si existen. Se alienta a los participantes a analizar a fondo las decisiones sobre la base de los Procedimientos Normalizados de Operaciones de su organización, haciendo hincapié en la solución de problemas paso a paso, en lugar de la adopción de decisiones rápida y en tiempo real. Un Supervisor del Ejercicio (moderador) presenta un escenario de simulación de tsunami a los participantes mediante un mensaje escrito, una llamada simulada por teléfono o por radio, u otros medios. A continuación se presentan los problemas y las actividades (contribuciones) del Ejercicio. Los participantes debaten colectivamente hasta llegar a una resolución generalmente acordada y sintetizada por un jefe de grupo. Un ejercicio de simulación debe tener metas específicas, objetivos y una descripción del escenario.

A continuación se expone la estructura de un ejercicio de simulación con muestras de textos y ejemplos.

1. Análisis de la vulnerabilidad: enunciado del problema

Un ejemplo en caso de huracán podría ser:
Debido a los recientes huracanes que afectaron al sudoeste de los Estados Unidos, ha aumentado la conciencia del peligro de amenaza que entrañan esos desastres, por lo que la necesidad de un sistema de evacuación es vital. El Estado de Luisiana prosigue sus tareas de planificación, preparación y formación en previsión de que se produzcan huracanes.

2. Propósito (Cometido): intenciones, qué se prevé lograr (Declaración de política)

Un ejemplo en caso de huracán podría ser:
El Estado de Luisiana ha tomado conciencia de la necesidad de disponer de un sistema de evacuación más eficiente y eficaz y, reconociéndola, le responde con este Plan de Ejercicio Integral. Incluye seminarios, talleres, un ejercicio de simulación, un ejercicio funcional y un ejercicio integral en un plazo de 18 meses, en el marco del programa de subsidios de la Seguridad Interior del Estado.

3. Alcance: Actividades del Ejercicio
Organismos participantes
Tipo de peligro
Zona geográfica afectada

Un ejemplo podría ser:
Los coordinadores de Servicios de Emergencia a nivel local del gobierno designarán las autoridades representativas de cada una de las seis regiones de ayuda mutua situadas en el territorio del Estado para que acojan una serie de ejercicios de preparación para casos de desastre. Estas autoridades anfitrionas elaborarán una serie gradual de ejercicios, basándose cada uno en el tipo de ejercicio anterior. El proceso comenzará con un análisis de la vulnerabilidad de las zonas que les competen y proseguirá con actividades sucesivas que incluirán: seminarios de

orientación, talleres y ejercicios de simulación y funcionales. El objetivo final de estas actividades será reducir los efectos de los desastres en su población y su infraestructura urbana. Todos los eventos se evaluarán utilizando las normas de presentación de informes posterior a la actividad [after action reporting (AAR)] del Programa de Evaluación de Ejercicios de la Seguridad del Interior de los Estados Unidos de América (HSEEP). Las etapas de las medidas correctivas pasarán a ser parte del proceso y el informe posteriores a la acción. Las autoridades de zonas vecinas de la zona de ayuda mutua serán miembros del equipo de diseño del ejercicio y evaluadores u observadores del ejercicio a los fines de la transmisión de información para incrementar su disponibilidad operacional. Las autoridades participarán por turno, cada dos años, lo que permitirá incrementar el número de autoridades participantes.

4. Metas y objetivos

Criterios para tener buenos objetivos para pensar "SMART"(por sus siglas en inglés):

• Simples (concisos),
• Mensurables ,
• Asequibles (¿se puede hacer esto durante el ejercicio?) ,
• Realistas (y estimulantes),
• Orientados hacia las tareas (orientados hacia las funciones).

Un ejemplo podría ser
Objetivos del programa del Ejercicio Integral:
• Mejorar la disponibilidad operacional.
• Reforzar la coordinación entre múltiples organismos y las capacidades para dar una respuesta eficaz a un desastre.
• Determinar los cauces de comunicación y las áreas problemáticas antes del desastre entre las autoridades locales y la zona de operaciones, y los centros regionales y estatales de operaciones para casos de emergencia.
• Establecer métodos uniformes de encargo, seguimiento y suministro de recursos para las entidades participantes en todos los niveles de gobierno.

5. Descripción del evento

La descripción del evento debe incluir lo siguiente:
• Activación de la emergencia/desastre,
• Descripción del medio ambiente en el momento en que comienza el ejercicio,
• Información de referencia necesaria,
• Preparación de los participantes para el Ejercicio,
• Descubrimiento, información: ¿cómo supo Ud. que se aproximaba un tsunami?,
• ¿Notificación previa? ,
• Hora, ubicación, extensión o gravedad de los daños.

6. Evaluación:

En la Evaluación ha de describirse lo siguiente:
•Cotejo con los objetivos.,
•Formación de los equipos de evaluación,
•Elaboración de formularios de evaluación.

7. Informe posterior a la actividad: este informe debe elaborarse utilizando los informes de evaluación**.**

8. Plan de mejoramiento: este Plan debería reducir las vulnerabilidades

Apéndice II. Descripción del evento

El origen del tsunami se basa de modo aproximado en observaciones relativas al terremoto y el tsunami ocurridos en las Islas Vírgenes en 1867. La información de referencia sobre el evento de 1867 proviene de: “Disaster and Disruption in 1867: Hurricane, Earthquake, and Tsunami in the Danish West Indies” (Watlington y Lincoln, 1997), “Caribbean Tsunamis” (O’Laughlin & Lander, 2003), el sitio web de la Universidad del Sur de California (USC) sobre los tsunamis (véase más adelante), “The 1867 Virgin Island Tsunami” (Zahibo, 2003), el informe de la USGS para la Nuclear Regulatory Commission: “Evaluation of Tsunami Sources with the Potential to Impact the U.S. Atlantic and Gulf of Mexico Coasts” (ten Brink et al., 2008), y “Tsunami Simulations of the 1867 Virgin Island Earthquake: Constraints on Epicenter Location and Fault Parameters” (Barkan y ten Brink, 2010).

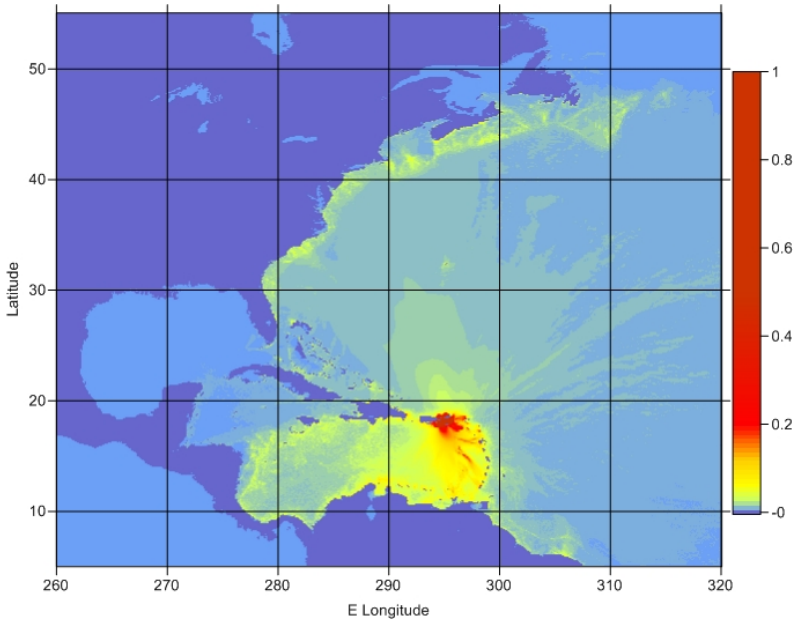
Puede encontrarse un breve resumen del evento de 1867 en el sitio web del Grupo de Investigación sobre Tsunamis de la Universidad del Sur de California (USC) en http://www.usc.edu/dept/tsunamis/caribbean/webpages/1867viindex.html

Los modelos del tsunami se calcularon utilizando el modelo de pronóstico de tsunami de Alaska (ATFM) del WCATWC y el modelo de inundación rápida y pronóstico de tsunami (RIFT) del PTWC para elaborar los efectos esperados en toda la región. Los modelos indicaron un importante tsunami en el Caribe oriental, con poco impacto fuera del Caribe. Sobre la base de los modelos, el Ejercicio se limitó a la región del Caribe, y no incluye otras zonas que se hallan bajo la responsabilidad de los centros de alerta contra tsunamis en el Atlántico o el Golfo de México. Los modelos del tsunami se basan en el evento de 1867 como doble fuente de seísmos en la Fosa de las Islas Vírgenes con aproximadamente 60 km entre los epicentros y 5 minutos entre las horas de inicio. Los parámetros de la fuente son los siguientes:

Fuente 1: hora = 13.00 UTC, 7,6 Mw, epicentro en {18º21 N, 65º26 O}.
Fuente 2: hora = 13.05 UTC, 7,6 Mw, epicentro en {18º36 N, 64º73 O}.
Para ambos eventos se utilizaron los siguientes parámetros:

Rumbo (strike):	71o
Buzamiento (dip):	8o
Ángulo de deslizamiento (slip):	90o
Largo:	70 km
Ancho:	35 km
Profundidad:	7 km
Momento:	7.5 x 1027 microbaras

Las fórmulas del desplazamiento del fondo marino se utilizaron para generar los dos levantamientos iniciales, y los modelos calcularon la propagación del tsunami desde esas fuentes para producir amplitudes previstas a lo largo de la costa atlántica estadounidense y la del Golfo de México, así como en todo el Caribe. Los resultados de los modelos se indican en las Figuras presentadas más adelante, y en el Cuadro se proporcionan las amplitudes previstas en las costas. Las amplitudes previstas se calcularon para puntos situados frente a la costa. La altura de la ola en la orilla podría ser el doble de la que indican los resultados de los modelos debido a la longitud del periodo del tsunami.



Latitud - Longitud

Figura II-1. Amplitud máxima del tsunami modelizado en todo el Atlántico Norte (escala en metros - ATFM).

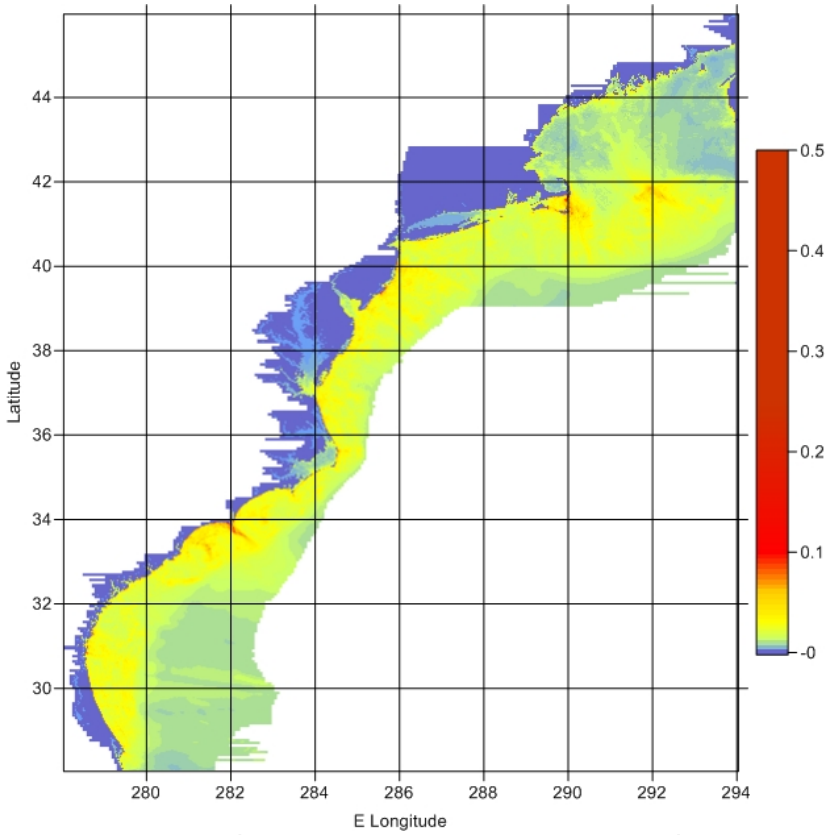


Figura II-2. Amplitud máxima del tsunami modelizado con más alta resolución cerca de la costa atlántica estadounidense (escala en metros - ATFM).

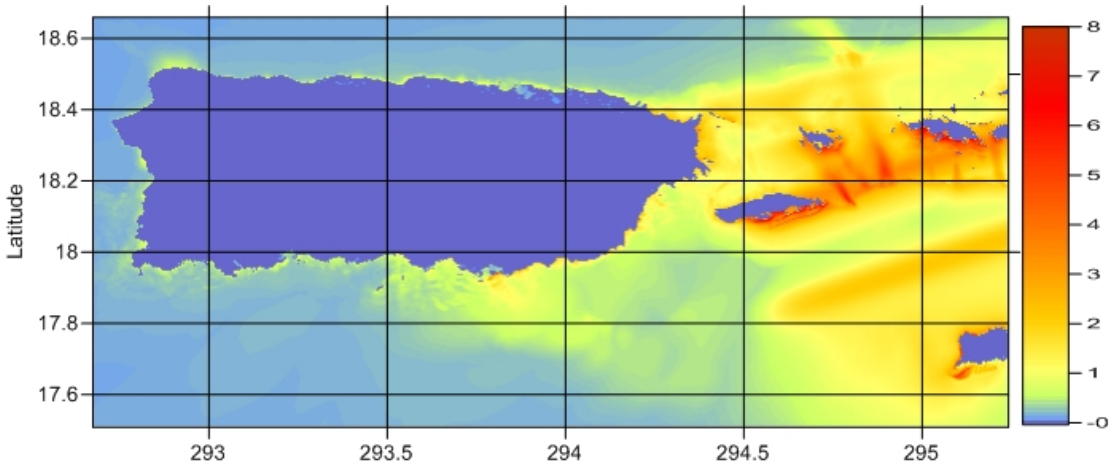


Figura II-3. Amplitud máxima del tsunami modelizado con más alta resolución cerca de Puerto Rico y las Islas Vírgenes (escala en metros - ATFM).

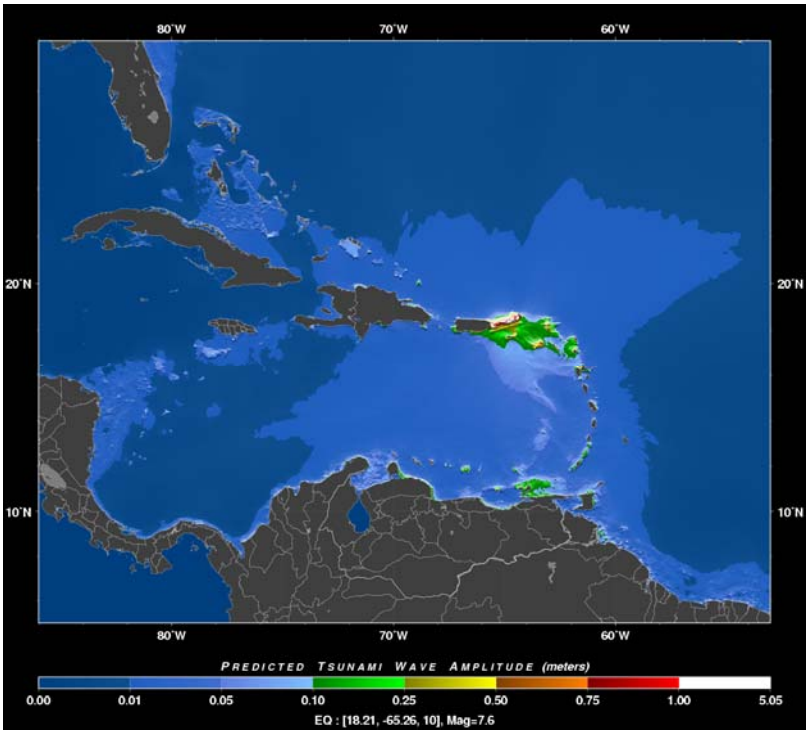


Figura II-4. Amplitud máxima del tsunami modelizado en el Caribe (escala en metros - RIFT)

Ubicación	Tiempo de viaje (h:min)	Ampl. máx (metros)	Primer efecto
Charlotte Amalie, VI	0:01	2.7	subida
Christiansted, VI	0:01	2.5	retirada
Fajardo, PR	0:01	0.95	retirada
Lameshur Bay, VI	0:02	2.85	retirada
Limetree Bay, VI	0:02	4.7	retirada
Virgin Gorda, BVI	0:03	1.4	retirada
Culebra, PR	0:05	2.0	subida
St. John, VI	0:07	0.26	subida
Tortola, BVI	0:07	0.47	subida
San Juan, PR	0:12	0.59	subida
Mona Island, PR	0:25	0.26	retirada
Magueyes Island, PR	0:28	0.75	retirada
D42407	0:32	.025	retirada
Aquadilla, PR	0:36	0.50	retirada
Saint Kitts	0:44	1.07	retirada
Anguilla	0:45	1.23	
Montserrat	0:45	0.18	retirada
Mayaguez, PR	0:47	0.50	retirada
Basse Terre, Guadaloupe	0:51	0.19	retirada
Cabo Engano, DR	0:54	0.12	retirada
Barbuda	0:55	0.13	retirada
Bonaire	0:55	0.07	retirada
Roseau, Dominica	0:55	0.23	retirada
Saint Maarten,	1:01	0.25	retirada
Santo Domingo	1:02	0.18	
Fort-de-France, Martinique	1:03	0.21	retirada
St Johns, Antigua	1:03	0.24	retirada
Saint Lucia	1:05	0.11	retirada
Saint Vincent	1:14	0.78	retirada
Curacao	1:11	0.27	retirada
Aruba	1:16	0.13	retirada
Grand Turk, Turks and Caicos	1:18	0.05	
St. Georges, Grenada	1:24	0.54	retirada
Maiquetia, VE	1:30	0.12	retirada
Puerto Plata, DR	1:30	0.04	subida
La Guaira, VE	1:31	0.15	retirada
Bridgetown, Barbados	1:38	0.05	retirada
Santa Marta, CO	1:57	0.095	retirada
Barranqilla, CO	2:01	0.11	retirada
Bermuda	2:05	0.09	retirada
Cumana, VE	2:05	0.14	subida
Cartagena, CO	2:18	0.02	retirada
Kingston, JA	2:26	0.08	retirada
Porlamar, VE	2:29	0.26	
Myrtle Beach, FL	3:02	0.08	subida
Gibara, Cuba	3:08	0.02	
Puerto Limon, _CR	3:11	0.04	retirada
Riohacha, CO	3:18	0.10	retirada
Punta Fijo, VE	3:42	0.085	subida
Port Au Prince, Haiti	3:57	0.04	retirada
Guantanamo Bay, Cuba	3:58	0.035	subida
Golfo_de_Venezuela, VE	4:20	0.02	retirada
Porlamar, VE	4:21	0.04	subida
Duck, NC	4:26	0.07	retirada
Trident Pier, FL	4:29	0.06	subida
Montego Bay, JA	4:35	~0.01	?
Ocean City, MD	4:54	0.11	retirada

Ubicación	Tiempo de viaje (h:min)	Ampl. máx (metros)	Primer efecto
Wrightsville, NC	5:05	0.06	subida
Flagler Beach, FL	5:06	0.075	subida
Key West, FL		< 0.01	
Georgetown, Guyana	5:12	0.04	
Atlantic City, NJ	5:14	0.19	retirada
Sunset Beach, NC	5:24	0.14	retirada
Port-O-Spain	5:24	~0.01	retirada
Springmaid Pier, SC	5:36	0.06	retirada
Oregon Inlet, SC	5:44	0.02	subida
Charleston, SC	5:48	0.03	subida
Nantucket Is., MA	6:24	0.085	subida
Providence, RI	7:03	0.055	subida

Cuadro II-1: Pronóstico de amplitud en la costa para el evento (ATFM y RIFT). La amplitud es la elevación del tsunami por encima del nivel del mar. La amplitud no toma en cuenta el levantamiento o la subsidencia del lugar debidas al terremoto. La amplitud se mide frente a la costa, las alturas sobre la costa podrían ser el doble de las que se indican en los modelos de pronósticos.

Tsunami Event

Date						Tsunami Cause		Tsunami Source Location				Tsunami Parameters				
Year	Mo	Dy	Hr	Mn	Sec	Val	Code	Country	Name	Latitude	Longitude	Max Water Height	Magnitude Abe	Magnitude Iida	Tsu Int	Warn Status
1867	11	18	18	45		4	1	USA TERRITORY	VIRGIN ISLANDS	18.100	-65.100	10.00		2.30		

Tsunami Runups

Addl Info	Doubtful Runup	Tsunami Runup Location							Tsunami Runup Measurements					Tsunami Runup Location Effects									
		Country	State/ Province/ Prefecture	Name	Latitude	Longitude	Distance from Source	Travel Time Hrs	Travel Time Min	Max Water Height	Max Inundation Distance	Type	Per	1st Mtn	Deaths Num	Deaths De	Injuries Num	Injuries De	Damage $Mill	Damage De	Houses Destroyed Num	Houses Destroyed De	Houses Damaged Num	Houses Damaged De
*		ANTIGUA AND BARBUDA		ANTIGUA: ST. JOHNS	17.193	-62.416	302			2.40		1												
*		ANTIGUA AND BARBUDA		BARBUDA: WEST COAST	17.717	-61.817	350			1.40		1												
*		BRITISH VIRGIN ISLANDS		PETER'S ISLAND	18.367	-64.633	58			1.20		1												
*		BRITISH VIRGIN ISLANDS		TORTOLA ISLAND: ROAD TOWN	18.414	-64.616	62			1.50	9.00	1		F					1		2			
*		DOMINICA		RUPERT'S BAY	15.500	-61.333	494			3.00		1												
*		GRENADA		GOUYAVE (CHARLOTTE TOWN)	12.167	-61.733	752			3.00		1							1					
*		GRENADA		SAINT GEORGE'S	12.015	-61.778	765			1.50		1		F										
*		GUADELOUPE		BASSE TERRE	16.000	-61.717	429			1.00		1												
*		GUADELOUPE		DESHAIES	16.317	-61.783	404			10.00		1		F					2					
*		GUADELOUPE		ILES DES SAINTES: FOND-DU-CIRE	15.867	-61.617	446			1.00		1							2					
*		GUADELOUPE		POINTE-A-PITRE	16.233	-61.533	432					1												
*		GUADELOUPE		SAINT BARTHELEMY ISLAND	17.900	-62.833	241					1							1					
*		GUADELOUPE		SAINT MARTIN	18.670	-63.067	224					1							1					
*		GUADELOUPE		SAINTE-ROSE	16.333	-61.700	411			10.00		1		F					2					
*		MARTINIQUE		MARTINIQUE	14.667	-61.000	581					1												
*		NETHERLANDS ANTILLES		SABA ISLAND	17.633	-63.233	204					1												
*		SAINT KITTS AND NEVIS		SAINT KITTS: BASSETERRE	17.300	-62.717	268				2.40	1		F										
*		SAINT LUCIA		LAYON, ANSE-LA-RAYE	13.883	-60.967	644			.90		1												
*		SAINT VINCENT AND THE GRENADINES		BEQUIA ISLAND: ADMIRALTY BAY	13.280	-61.250	676			1.80	146.00	1							1		2			
*		SAINT VINCENT AND THE GRENADINES		SAINT VINCENT	13.130	-61.200	693					1												
*		USA TERRITORY	PR	PUERTO RICO: ARROYO	17.983	-66.050	101			.90	40.00	1												
*		USA TERRITORY	PR	PUERTO RICO: BAHIA DE SAN JUAN	18.450	-66.117	114			.90		1		F										
*		USA TERRITORY	PR	PUERTO RICO: PLAYA DE FAJARDO	18.333	-65.633	62					1		F										
*		USA TERRITORY	PR	PUERTO RICO: VIEQUES	18.150	-65.450	37					1		F										
*		USA TERRITORY	PR	PUERTO RICO: YABUCOA	18.033	-65.883	83			1.37		1		F										
*		USA TERRITORY	VI	VIRGIN ISLANDS: ALTONA	18.341	-64.949	31				76.20	1							2		2			
*		USA TERRITORY	VI	VIRGIN ISLANDS: CHARLOTTE AMALIE	18.333	-64.917	32			6.00		1	10	F	12	1			2					
*		USA TERRITORY	VI	VIRGIN ISLANDS: CHISTIANSTED	17.767	-64.733	54				91.00	1		F										
*		USA TERRITORY	VI	VIRGIN ISLANDS: FREDERIKSTED	17.717	-64.883	48	0	12	7.60	76.00	1		F	5	1			1		20	1		
*		USA TERRITORY	VI	VIRGIN ISLANDS: GALLOWS BAY	17.600	-64.700	70					1							1		20	1		
*		USA TERRITORY	VI	VIRGIN ISLANDS: HASSEL ISLAND	18.300	-64.960	27			4.90		1			3	1								
*		USA TERRITORY	VI	VIRGIN ISLANDS: SABA ISLAND	18.341	-64.982	30					1			10	1								
*		USA TERRITORY	VI	VIRGIN ISLANDS: SAINT CROIX	17.750	-64.750	54			7.00		1												

Figura II-5. Datos de tsunamis históricos para el evento de 1867 (NGDC)

No.	Title	Languages
1	Manual on International Oceanographic Data Exchange. 1965	(out of stock)
2	Intergovernmental Oceanographic Commission (Five years of work). 1966	(out of stock)
3	Radio Communication Requirements of Oceanography. 1967	(out of stock)
4	Manual on International Oceanographic Data Exchange - Second revised edition. 1967	(out of stock)
5	Legal Problems Associated with Ocean Data Acquisition Systems (ODAS). 1969	(out of stock)
6	Perspectives in Oceanography, 1968	(out of stock)
7	Comprehensive Outline of the Scope of the Long-term and Expanded Programme of Oceanic Exploration and Research. 1970	(out of stock)
8	IGOSS (Integrated Global Ocean Station System) - General Plan Implementation Programme for Phase I. 1971	(out of stock)
9	Manual on International Oceanographic Data Exchange - Third Revised Edition. 1973	(out of stock)
10	Bruun Memorial Lectures, 1971	E, F, S, R
11	Bruun Memorial Lectures, 1973	(out of stock)
12	Oceanographic Products and Methods of Analysis and Prediction. 1977	E only
13	International Decade of Ocean Exploration (IDOE), 1971-1980. 1974	(out of stock)
14	A Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment and Baseline Study Guidelines. 1976	E, F, S, R
15	Bruun Memorial Lectures, 1975 - Co-operative Study of the Kuroshio and Adjacent Regions. 1976	(out of stock)
16	Integrated Ocean Global Station System (IGOSS) General Plan and Implementation Programme 1977-1982. 1977	E, F, S, R
17	Oceanographic Components of the Global Atmospheric Research Programme (GARP) . 1977	(out of stock)
18	Global Ocean Pollution: An Overview. 1977	(out of stock)
19	Bruun Memorial Lectures - The Importance and Application of Satellite and Remotely Sensed Data to Oceanography. 1977	(out of stock)
20	A Focus for Ocean Research: The Intergovernmental Oceanographic Commission - History, Functions, Achievements. 1979	(out of stock)
21	Bruun Memorial Lectures, 1979: Marine Environment and Ocean Resources. 1986	E, F, S, R
22	Scientific Report of the Interealibration Exercise of the IOC-WMO-UNEP Pilot Project on Monitoring Background Levels of Selected Pollutants in Open Ocean Waters. 1982	(out of stock)
23	Operational Sea-Level Stations. 1983	E, F, S, R
24	Time-Series of Ocean Measurements. Vol.1. 1983	E, F, S, R
25	A Framework for the Implementation of the Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment. 1984	(out of stock)
26	The Determination of Polychlorinated Biphenyls in Open-ocean Waters. 1984	E only
27	Ocean Observing System Development Programme. 1984	E, F, S, R
28	Bruun Memorial Lectures, 1982: Ocean Science for the Year 2000. 1984	E, F, S, R
29	Catalogue of Tide Gauges in the Pacific. 1985	E only
30	Time-Series of Ocean Measurements. Vol. 2. 1984	E only
31	Time-Series of Ocean Measurements. Vol. 3. 1986	E only
32	Summary of Radiometric Ages from the Pacific. 1987	E only
33	Time-Series of Ocean Measurements. Vol. 4. 1988	E only

(continued)

No.	Title	Languages
34	Bruun Memorial Lectures, 1987: Recent Advances in Selected Areas of Ocean Sciences in the Regions of the Caribbean, Indian Ocean and the Western Pacific. 1988	Composite E, F, S
35	Global Sea-Level Observing System (GLOSS) Implementation Plan. 1990	E only
36	Bruun Memorial Lectures 1989: Impact of New Technology on Marine Scientific Research. 1991	Composite E, F, S
37	Tsunami Glossary - A Glossary of Terms and Acronyms Used in the Tsunami Literature. 1991	E only
38	The Oceans and Climate: A Guide to Present Needs. 1991	E only
39	Bruun Memorial Lectures, 1991: Modelling and Prediction in Marine Science. 1992	E only
40	Oceanic Interdecadal Climate Variability. 1992	E only
41	Marine Debris: Solid Waste Management Action for the Wider Caribbean. 1994	E only
42	Calculation of New Depth Equations for Expendable Bathymerographs Using a Temperature-Error-Free Method (Application to Sippican/TSK T-7, T-6 and T-4 XBTS. 1994	E only
43	IGOSS Plan and Implementation Programme 1996-2003. 1996	E, F, S, R
44	Design and Implementation of some Harmful Algal Monitoring Systems. 1996	E only
45	Use of Standards and Reference Materials in the Measurement of Chlorinated Hydrocarbon Residues. 1996	E only
46	Equatorial Segment of the Mid-Atlantic Ridge. 1996	E only
47	Peace in the Oceans: Ocean Governance and the Agenda for Peace; the Proceedings of *Pacem in Maribus* XXIII, Costa Rica, 1995. 1997	E only
48	Neotectonics and fluid flow through seafloor sediments in the Eastern Mediterranean and Black Seas - Parts I and II. 1997	E only
49	Global Temperature Salinity Profile Programme: Overview and Future. 1998	E only
50	Global Sea-Level Observing System (GLOSS) Implementation Plan-1997. 1997	E only
51	L'état actuel de 1'exploitation des pêcheries maritimes au Cameroun et leur gestion intégrée dans la sous-région du Golfe de Guinée *(cancelled)*	F only
52	Cold water carbonate mounds and sediment transport on the Northeast Atlantic Margin. 1998	E only
53	The Baltic Floating University: Training Through Research in the Baltic, Barents and White Seas - 1997. 1998	E only
54	Geological Processes on the Northeast Atlantic Margin (8^{th} training-through-research cruise, June-August 1998). 1999	E only
55	Bruun Memorial Lectures, 1999: Ocean Predictability. 2000	E only
56	Multidisciplinary Study of Geological Processes on the North East Atlantic and Western Mediterranean Margins (9^{th} training-through-research cruise, June-July 1999). 2000	E only
57	Ad hoc Benthic Indicator Group - Results of Initial Planning Meeting, Paris, France, 6-9 December 1999. 2000	E only
58	Bruun Memorial Lectures, 2001: Operational Oceanography – a perspective from the private sector. 2001	E only
59	Monitoring and Management Strategies for Harmful Algal Blooms in Coastal Waters. 2001	E only
60	Interdisciplinary Approaches to Geoscience on the North East Atlantic Margin and Mid-Atlantic Ridge (10^{th} training-through-research cruise, July-August 2000). 2001	E only
61	Forecasting Ocean Science? Pros and Cons, Potsdam Lecture, 1999. 2002	E only

No.	Title	Languages
62	Geological Processes in the Mediterranean and Black Seas and North East Atlantic (11th training-through-research cruise, July- September 2001). 2002	E only
63	Improved Global Bathymetry – Final Report of SCOR Working Group 107. 2002	E only
64	R. Revelle Memorial Lecture, 2006: Global Sea Levels, Past, Present and Future. 2007	E only
65	Bruun Memorial Lectures, 2003: Gas Hydrates – a potential source of energy from the oceans. 2003	E only
66	Bruun Memorial Lectures, 2003: Energy from the Sea: the potential and realities of Ocean Thermal Energy Conversion (OTEC). 2003	E only
67	Interdisciplinary Geoscience Research on the North East Atlantic Margin, Mediterranean Sea and Mid-Atlantic Ridge (12th training-through-research cruise, June-August 2002). 2003	E only
68	Interdisciplinary Studies of North Atlantic and Labrador Sea Margin Architecture and Sedimentary Processes (13th training-through-research cruise, July-September 2003). 2004	E only
69	Biodiversity and Distribution of the Megafauna / Biodiversité et distribution de la mégafaune. 2006 Vol.1 The polymetallic nodule ecosystem of the Eastern Equatorial Pacific Ocean / Ecosystème de nodules polymétalliques de l'océan Pacifique Est équatorial Vol.2 Annotated photographic Atlas of the echinoderms of the Clarion-Clipperton fracture zone / Atlas photographique annoté des échinodermes de la zone de fractures de Clarion et de Clipperton Vol.3 Options for the management and conservation of the biodiversity — The nodule ecosystem in the Clarion Clipperton fracture zone: scientific, legal and institutional aspects	E F
70	Interdisciplinary geoscience studies of the Gulf of Cadiz and Western Mediterranean Basin (14th training-through-research cruise, July-September 2004). 2006	E only
71	Indian Ocean Tsunami Warning and Mitigation System, IOTWS. Implementation Plan, 7–9 April 2009 (2nd Revision). 2009	E only
72	Deep-water Cold Seeps, Sedimentary Environments and Ecosystems of the Black and Tyrrhenian Seas and the Gulf of Cadiz (15th training-through-research cruise, June–August 2005). 2007	E only
73	Implementation Plan for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS), 2007–2011. 2007 *(electronic only)*	E only
74	Bruun Memorial Lectures, 2005: The Ecology and Oceanography of Harmful Algal Blooms – Multidisciplinary approaches to research and management. 2007	E only
75	National Ocean Policy. The Basic Texts from: Australia, Brazil, Canada, China, Colombia, Japan, Norway, Portugal, Russian Federation, United States of America. (Also Law of Sea Dossier 1). 2008	E only
76	Deep-water Depositional Systems and Cold Seeps of the Western Mediterranean, Gulf of Cadiz and Norwegian Continental margins (16th training-through-research cruise, May–July 2006). 2008	E only
77	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – 12 September 2007 Indian Ocean Tsunami Event. Post-Event Assessment of IOTWS Performance. 2008	E only
78	Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE EWS) – Implementation Plan 2008. 2008	E only
79	Filling Gaps in Large Marine Ecosystem Nitrogen Loadings Forecast for 64	E only

(continued)

No.	Title	Languages
	LMEs – GEF/LME global project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	
80	Models of the World's Large Marine Ecosystems. GEF/LME Global Project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	E only
81	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – Implementation Plan for Regional Tsunami Watch Providers (RTWP). 2008	E only
82	Exercise Pacific Wave 08 – A Pacific-wide Tsunami Warning and Communication Exercise, 28–30 October 2008. 2008	E only
83.	*Cancelled*	
84.	Global Open Oceans and Deep Seabed (GOODS) Bio-geographic Classification. 2009	E only
85.	Tsunami Glossary	E, F, S
86	Pacific Tsunami Warning System (PTWS) Implementation Plan *(under preparation)*	
87.	Operational Users Guide for the Pacific Tsunami Warning and Mitigation System (PTWS) – January 2009. 2009	E only
88.	Exercise Indian Ocean Wave 2009 (IOWave09) – An Indian Ocean-wide Tsunami Warning and Communication Exercise – 14 October 2009. 2009	E only
89.	Ship-based Repeat Hydrography: A Strategy for a Sustained Global Programme. 2009	E only
90.	12 January 2010 Haiti Earthquake and Tsunami Event Post-Event Assessment of CARIBE EWS Performance. 2010	E only
91.	Compendium of Definitions and Terminology on Hazards, Disasters, Vulnerability and Risks in a coastal context	*Under preparation*
92.	Pacific Tsunami Warning System (PTWS) 27 February 2010 Chile Earthquake and Tsunami Event — Post-Event Assessment of PTWS Performance	*Under preparation*
93.	Exercise CARIBE WAVE 11 —A Caribbean Tsunami Warning Exercise 23 March 2011. Participant Handbook / Exercise CARIBE WAVE 11 —Exercice d'alerte au tsunami dans les Caraïbes. Manuel du participant / Ejercicio Caribe Wave 11. Un ejercicio de alerta de tsunami en el Caribe, 23 de marzo de 2011. Manual del participante. 2010	E/F/S

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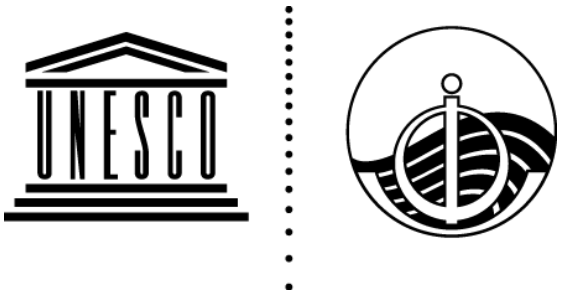

EXERCISE
CARIBE WAVE 11/ LANTEX11
A Caribbean Tsunami Warning Exercise

Report

Volume 2

UNESCO

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Executive Summary

During the first regional tsunami exercise CARIBE WAVE 2011 held on 23 March 2011 jointly with LANTEX there were 34 countries and territories* within the Caribbean participating in it. This exercise was conducted under the framework of the UNESCO/IOC Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS). This represents a participation rate of almost 90 % of the nations in the region that have nominated Tsunami Warning Focal Points and National Contacts in the region and 75 % of all the countries and territories in the region.

The scenario of the exercise was a magnitude 7.6 earthquake in the Virgin Islands basin which generated a tsunami with run-ups of up to 10 metres. At 13:02 UTC, the NOAA NWS Pacific Tsunami Warning Center (PTWC) and NOAA NWS West Coast and Alaska Tsunami Warning Center (WC/ATWC) issued a “Dummy” Message to all the officially designated Tsunami Warning Forecast Points (TWFP). The bulletins that would be issued for such an event by the PTWC and WC/ATWC which currently serve the Caribbean were included in the Exercise Manual which was distributed in December 2010 in French, Spanish and English. Nevertheless, for the first time for such an exercise, almost 300 public and private institutions signed up to receive all the exercise bulletins via email from the warning centres during the exercise.

All of the participants of CARIBE WAVE were able to test the communications systems between the warning centres and the officially designated TWFP. The participants received the messages by fax, email, EMWIN (Emergency Managers Weather Information Network) and/or the GTS (Global Telecommunication Systems). Sirens, text messages, emails, emergency alert systems, media outlets, NOAA weather radio and traditional telephone calls were then used by many TWFP to disseminate the messages to the government authorities and the public. Given the ample awareness campaigns that were conducted in preparation for the event, no false alarms were reported. In addition to the communication test, exercises were conducted at various additional levels of magnitudes and sophistication and included seminars, table top exercises and drills. Several countries used the opportunity to review their protocols for issuing “All Clear” messages after a Tsunami strike.

Planning for CARIBE WAVE took a full year and was coordinated by a task team led by the Caribbean Tsunami Warning Program and included the Tsunami Unit (IOC Secretariat), CARIBE EWS officers, PTWC, WC/ATWC, national and regional emergency management organizations, Tsunami National Contacts and Tsunami Warning Focal Points. To promote and discuss the exercise, dozens of talks, interviews and webinars were conducted by the stakeholders throughout the Caribbean. At least five special websites were established by organizations to share information on the event. The media also played a key role before, during and after the exercise in alerting the public and identifying strengths and gaps in the tsunami warning system.

An evaluation questionnaire was posted online so that each of the countries could provide feedback on the exercise. Thirty-two of the 34 (94 %) participating countries and territories submitted a questionnaire. The main observations and findings from this exercise were the following:

- In addition to the National authorities, 60 % of the nations also activated local organizations for the exercise.
- Thirthy-three (33 %) per cent of the respondents indicated that schools also participated.

- In 50 % of the countries private institutions and organizations also participated, mainly from the tourism and port sectors.
- Eighty-three (83 %) per cent reported that they found the format of the exercise satisfactory.
- Ninety (90 %) per cent of the Tsunami Warning Focal Points received in a timely fashion the “dummy” message sent by the Tsunami Warning Centres (TWC) kicking off the exercise.
- Ninety (90 %) per cent of the participants also noted that they found the bulletins that were prepared for the exercise and would be issued for such an event to be clear, while 37 % indicated that more content should be added.
- Eighty-seven (87 %) per cent of the countries signed up to receive emails with the actual TWC products during the event and almost all of these, 85 % found them helpful.
- Forty (40 %) per cent of the participants indicated that in addition to the products of the TWC, they received special products from another agency, for example, Met Services, Seismic Networks and the Caribbean Disaster Emergency Management Agency.
- While 50 % of the respondents indicated that they had a tsunami response plan and 69 % that actions were laid out to respond to a tsunami, only 47 % indicated that it was adequate to address a tsunami threat.
- Sixty (60 %) per cent of the countries received feedback from the public directly or through different media outlets.
- Although only 40 % of the countries reported to have participated in the webinars, 100 % of all who responded indicated that they were useful, highlighting this mechanism as an important one for training and coordination in the region.

As 100 % of the countries and territories indicated through the survey, despite gaps in communications and actions, the exercise was helpful in validating or highlighting the need for tsunami planning. There is an absolute need to reinforce preparedness, evacuation plans and involvement of private sector in tsunami readiness. The fact that the population and press has a high interest and awareness on these matters is important.

The CARIBE EWS in light of CARIBE WAVE 2011 can consider if and when another such tsunami exercise and integrating the lessons learned, as well as consider different scenarios.

*Aruba, Antigua and Barbuda, Bahamas, Barbados, Belize, Bolivarian Republic of Venezuela, Colombia, Curacao, Dominica, Dominican Republic, France (Martinique, Guadeloupe, St Martin), Grenada, Guatemala, Haiti, Honduras, Jamaica, Mexico, Netherlands (Sint Eustatius), Nicaragua, Panama, Peru, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten, Trinidad and Tobago, United Kingdom (Anguilla, British Virgin Islands, Bermuda, Cayman Islands, Turks and Caicos), United States (Puerto Rico and the US Virgin Islands).

1. INTRODUCTION

1.1 BACKGROUND

The **Exercise CARIBE WAVE 11/LANTEX** was conducted to assist tsunami preparedness efforts throughout the Caribbean region. 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 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.

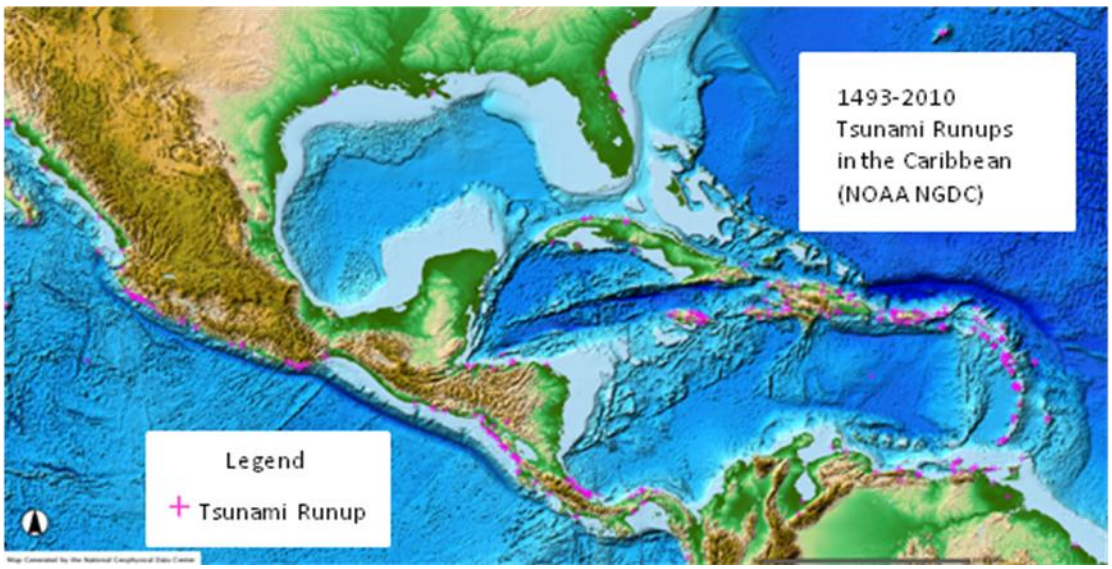

Figure.1 Map of tsunami run-ups in the Caribbean 1493–2010
(National Geophysical Data Center, http://www.ngdc.noaa.gov/hazards/tsu.shtml)

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 perimetre 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 (Tarr et al, 2007).

In the northeastern Caribbean, the Puerto Rico Trench, roughly parallel to and about 75 miles off the northern coast of Puerto Rico, is about 900 kilometres (560 miles) long and 100 kilometres (60 miles) wide (Figure 3). At 8,350 metres (27,362 feet) below the sea surface, the trench is deepest point in the Atlantic Ocean. The Hispaniola Trench parallels the north coast of the Dominican Republic and Haiti, and is 550 kilometres (344 miles) long and only 4,500 metres

(14764 feet) deep. The Virgin Islands and Anegada troughs cut across the Antilles arc between the northern Virgin Islands and St. Croix and the Lesser Antilles. Tsunamis could be generated along these different structures, but the direction and size of the waves would depend on many factors, including where the earthquake occurred. In 1867, a M 7.3 earthquake occurred within the basin that generated a tsunami with wave heights near 7.6 metres in St. Croix, U.S.V.I; 10 m in Deshaies, Guadeloupe; and was observed across the Northeastern and Eastern Caribbean (Reid and Taber, 1920; Watlington, 1997). This event was used as the basis for this exercise.

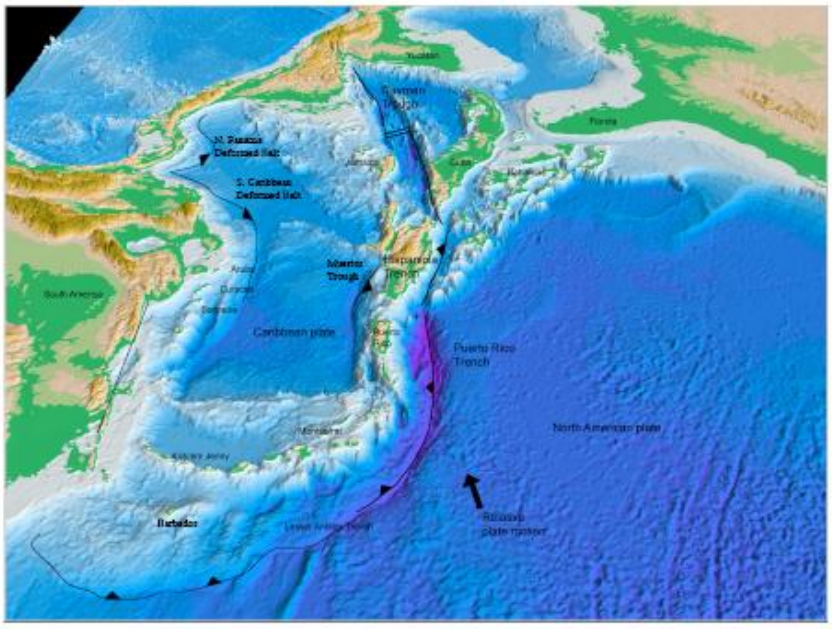

Figure.2 Tectonic features in the Caribbean (ten Brink et al., 2008).

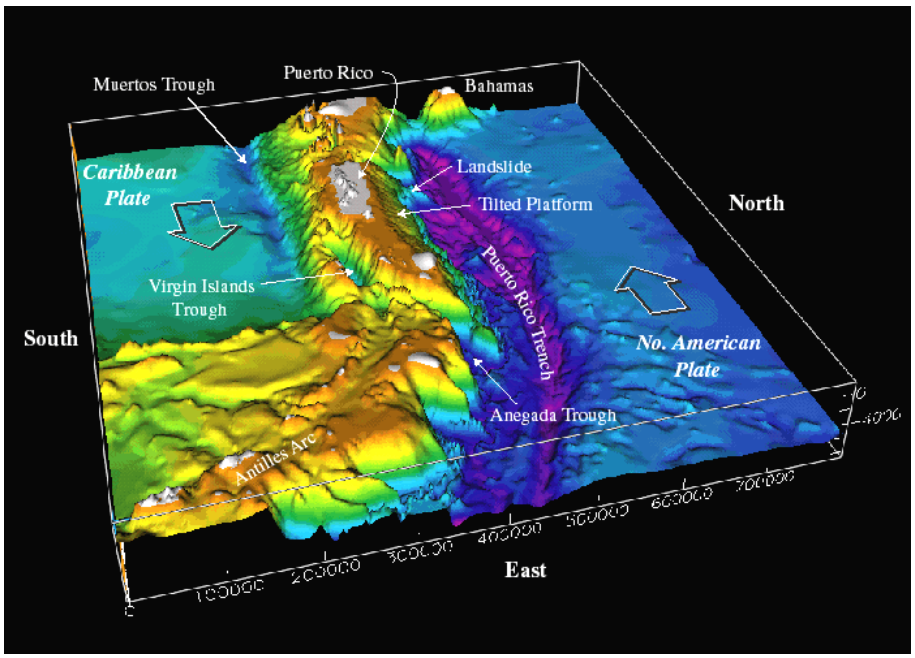

Figure.3 Tectonic features in the north-eastern Caribbean (ten Brink et al., 2008).

Tsunami warning services for the Caribbean are currently provided by the West Coast/Alaska Tsunami Warning Center (WC/ATWC) in Palmer, Alaska for Puerto Rico and the Virgin Islands, while the Pacific Tsunami Warning Center (PTWC) in Ewa Beach, Hawaii, is providing services for the non-US Caribbean. These Centres issue tsunami products to the region approximately 2 to 10 minutes after an earthquake's occurrence. The WC/ATWC 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), state/territory warning points/emergency operation centres, 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, La Fundación Venezolana de Investigaciones Sismológicas (FUNVISIS) in Venezuela, and other national and regional institutions also provide earthquake and tsunami information for their areas of responsibilities.

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) provided 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 provided a strong incentive for local jurisdictions to prepare for a tsunami.

This exercise provided simulated tsunami warning, watch, and advisory messages from the TWCs based on the hypothetical magnitude 7.6 earthquake located near the U.S. Virgin Islands at 18.2oN, 65.3oW. A total of 34 countries and territories participated in the exercise. This represented a participation rate of over 90 % of the countries and territories in the region. Exercises like this will help ensure that Caribbean coasts are ready to respond in the event of a dangerous tsunami. Similar recent exercises in the Pacific and Atlantic Basins have proven effective in strengthening preparedness levels of emergency management organizations.

2. EXERCISE CONCEPT

2.1 PURPOSE

The purpose of the exercise was to improve Tsunami Warning System effectiveness along the Caribbean coasts. The exercise provided 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) was encouraged to participate.

2.2 OBJECTIVES

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

- Ensure message transmission from the Tsunami Warning Centres (TWCs) to Tsunami Warning Focal Points (TWFPs) and from these primary contacts to the EMOs.
- Test tsunami response plans for Caribbean EMOs that had developed plans, and provide a catalyst for countries and EMOs that had not developed plans.

- EMOs, TFWPs and Tsunami National Contacts (TNCs) review, discuss, and evaluate the various communication alternatives for receiving and disseminating tsunami messages.
- EMOs, TFWPs and TNCs review, discuss, and evaluate potential response actions and challenges.
- Identify processes to issue local all-clear notices.

2.3 TYPES OF EXERCISE

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

Exercises stimulated the development, training, testing, and evaluation of Disaster Plans and Standard Operating Procedures. Some of the exercise participants used their own past multi-hazard drills (e.g. flood, hurricane, tsunami, earthquake, etc.) as a framework to conduct CARIBE WAVE 11/LANTEX 11.

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

(i) **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 had a specific goal and written objectives and result in an agreed upon Plan of Action.

(ii) **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.

Figure.4 Students at Anguilla participating in the exercise

Figure.5 Students and other persons participating in the national simulation exercise at British Virgin Islands (BVI News, Alliance News, http://bvinews.com/bvi/ddm-reports-tsunami-sumulation-exercise-was-a-success/)

(iii) **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.

Figure.6 Tabletop Exercise at Martinique, French West Indies

Figure.7 Tabletop Exercise at Sint Maarten, Kingdom of the Netherlands

(iv) **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 centre, emergency command centre, command post, master control centre, 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.

Figure 8. Functional Exercise at the Emergency Operations Center (COE)
from the Emergency Management Agency and Disaster Administration (AEMEAD) in Puerto Rico.

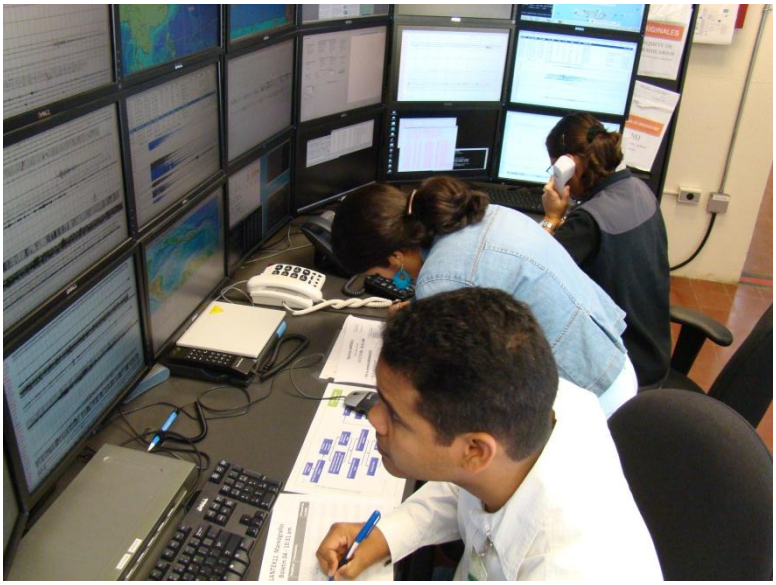

Figure.9 Puerto Rico Seismic Network analysts participating in a Functional Exercise

3. EXERCISE OUTLINE

3.1 GENERAL

The tsunami source was based roughly on observations of the 1867 Virgin Islands earthquake and tsunami. Background information on the 1867 event was obtained from: “Disaster and Disruption in 1867: Hurricane, Earthquake, and Tsunami in the Danish West Indies” (Watlington and Lincoln, 1997); “Caribbean Tsunamis” (O’Laughlin & Lander, 2003); the USC tsunami website (see below); “The 1867 Virgin Island Tsunami” (Zahibo, 2003); the USGS report for the Nuclear Regulatory Commission: “Evaluation of Tsunami Sources with the Potential to Impact the U.S. Atlantic and Gulf of Mexico Coasts” (ten Brink et al., 2008); and Tsunami Simulations of the 1867 Virgin Island Earthquake: Constraints on Epicentre Location and Fault Parametres (Barkan and ten Brink, 2010). The tsunami inundation maps for Puerto Rico included Virgin Islands/Anegada trough scenarios based on “Mode of Faulting in the Local Zone of Puerto Rico (LZPR) by Huérfano Moreno (2003). A brief summary of the 1867 event can be found at the University of Southern California’s (USC) Tsunami Research Group’s website at http://www.usc.edu/dept/tsunamis/caribbean/webpages/1867viindex.html. The approximate historic epicentre (based on USC information) is shown in the Figure.10.

Tsunami models were computed using WC/ATWC’s Alaska Tsunami Forecast Model (ATFM) and PTWC’s Rapid Inundation and 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. Based on the models, the exercise was limited to the Caribbean region, and did not include other TWC areas-of-responsibility in the Atlantic or Gulf of Mexico. However some countries participated in the exercise as observers. The tsunami models were based on the 1867 event as a double quake source in the Virgin Islands Trough with approximately 60 km between epicentres and 5 minutes between origin times. The earthquake source parametres were:

Source1:

time = 1300 UTC, Mw 7.6, epicentre at {18.21N, 65.26W}, strike = 71o, dip, 8o, slip 90o.

Source2:

time = 1305 UTC, Mw 7.6, epicentre at {18.36N, 64.73W}, strike = 71o, dip, 8o, slip 90o.

Sea floor displacement formulae were used to generate the two initial uplifts, and the ATFM computed tsunami propagation from those sources to produce forecast amplitudes along the U.S. Atlantic and Gulf of Mexico coasts, and throughout the Caribbean.

Figure 10 Approximate location of November 18, 1867 earthquake and tsunami.

At 13:02 (1.02 p.m.) UTC, the NOAA Pacific Tsunami Warning Center (PTWC) and NOAA West Coast and Alaska Tsunami Warning Center (WC/ATWC) issued a “Dummy” Message to all the officially designated Tsunami Warning Forecast Points (TWFP). WC/ATWC issued a tsunami warning for Puerto Rico and the Virgin Islands, while PTWC issued a Regional Tsunami Watch. The U.S. east coast and the Gulf of Mexico was included in the WC/ATWC message as information only since the tsunami threat was minimal. Definitions of the products that were issued by the TWCs during this exercise are provided below. (Note that PTWC products differ from WC/ATWC products due to requirements set forth by the ICG/CARIBE EWS).

West Coast Alaska Tsunami Warning Center:

Tsunami Warning – A tsunami warning is issued when a potential tsunami with significant widespread inundation is imminent or expected. Warnings alert the public that widespread, dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after arrival of the initial wave. Warnings also 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.

Tsunami Advisory – A tsunami advisory is issued due to the threat of a potential tsunami which may produce strong currents or waves dangerous to those in or near the water. Coastal regions historically prone to damage due to strong currents induced by tsunamis are at the greatest risk. The threat may continue for several hours after the arrival of the initial wave, but significant widespread inundation is not expected for areas under an advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbors and marinas, and the repositioning of ships to deep waters when there is time to safely do so. Advisories are normally updated to continue the advisory, expand/contract affected areas, upgrade to a warning, or cancel the advisory.

Pacific Tsunami Warning Center:

Tsunami Watch – Watches are issued by the TWCs based on seismic information without confirmation that a destructive tsunami is underway. It is issued as a means of providing an advance alert to areas that could be impacted by destructive tsunami waves. Watches are updated at least hourly to continue them, expand their coverage, upgrade them to a Warning, or end the alert. A Watch for a particular area may be included in the text of the message that disseminates a Warning for another area.

Tsunami Information Bulletin (TIB) – A text product is issued to inform that an earthquake has occurred and to advise regarding its potential to generate a tsunami. In most cases, a Tsunami Information Bulletin indicates there is no threat of a destructive tsunami, and are used to prevent unnecessary evacuations as the earthquake may have been felt in coastal areas. A Tsunami Information Bulletin may, in appropriate situations, caution about the possibility of a destructive local tsunami. A supplemental Tsunami Information Bulletin may be issued if important additional information is received such as a sea level reading showing a tsunami signal. A Tsunami Information Bulletin may also be upgraded to a watch, advisory, or warning if appropriate.

The TWCs did not issued live messages over broadcast dissemination channels other than the initial dummy message to start the exercise at 13.02 UTC on 23 March 2011. However, messages from the TWCs were emailed and faxed to specific recipients who requested live dissemination throughout the event. Almost 300 public and private institutions signed up with the NOAA Caribbean Tsunami Warning Program (CTWP) to receive all these exercise bulletins. The content of the dummy message is given in Annex II. The dummy message indicated that the exercise participants had to refer to the first message provided in this report. From then on, participants had to follow the schedule in Table 1 to look at new messages if they were not receiving them via email or fax. Table 1 was the timeline for when messages were to be issued by the TWCs if this were a real event, and was used by EMOs to drive the exercise timing. Sirens, text messages, emails, emergency alert systems, media outlets, NOAA weather radio and traditional telephone calls were then used by many TWFP to disseminate the messages to the government authorities and the public. The warning messages (as shown in Annex III) covered 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 listed in Table 2.

During real events, the WC/ATWC issues two official products each time a message is issued. The first, and the ones provided in Annex III, are known as the standard message. This message is a segmented message which includes encoded NWS zones, Valid Time Event Codes (VTEC), and their level of threat in the lower section of the message. The segmentation is used for automated processing systems which parse NWS products. The standard product also lists expected arrival times. The second product is known as the public message. This message has no segmentation and is written in a non-tabular, easier-to-read format. The products contain the same basic information. EMOs generally use the standard product for warning response as it has more

complete information. WC/ATWC also issues additional graphical and web-based products to its web site.

EMOs were 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, were also encouraged.

3.2 MASTER SCHEDULE (EXERCISE SCRIPT)

Scenario Timeline

Tsunami generated by a magnitude 7.6 earthquake with epicentre at 18.2ºN, 65.3ºW occurring on March 23, 2011 at 1300 UTC and a second nearby earthquake which occured 5 minutes later. The initial warning was disseminated at 1302 UTC.

Date (UTC)	Time (UTC)	WC/ATWC Message				PTWC Message			
		#	Type	Dummy	Email	#	Type	Dummy	Email
03/23/2011	1300		- - - - - - E a r t h q u a k e O c c u r s - - - - - -						
03/23/2011	1302	01	Warn	Yes	Yes	01	Watch	Yes	Yes
03/23/2011	1332	02	Warn	No	Yes				
03/23/2011	1401	03	Warn	No	Yes	02	Watch	No	Yes
03/23/2011	1431	04	Warn	No	Yes				
03/23/2011	1500	05	Warn	No	Yes	03	Watch	No	Yes
03/23/2011	1530	06	Warn	No	Yes				
03/23/2011	1601	07	Adv	No	Yes	04	Watch	No	Yes
03/23/2011	1630	08	Adv	No	Yes				
03/23/2011	1701	09	Can	No	Yes	05	Watch	No	Yes
03/23/2011	1802					06	Can	No	Yes

Table.1 Scenario Timeline

The initial dummy message was disseminated over all standard TWC broadcast channels as listed in Table 2. This was issued to test communications with EMOs and Tsunami Warning Focal Points, and to start the exercise. All messages were disseminated over a special email list to provide the messages in real time to organizations requesting this service.

TWC Message Types:

Warn	Tsunami Warning
Advisory	Tsunami Advisory
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

Product Types

Product Types Issued for Dummy Message with Transmission Methods

Centre	WMO ID	AWIPS ID	NWWS	GTS	EMWIN	Fax	Email
WC/ATWC	WEXX20 PAAQ	TSUAT1	Yes	Yes	Yes	Yes	Yes
PTWC	WECA41 PHEB	TSUCAX	Yes	Yes	Yes	Yes	Yes

Table.2 Product Types

NWWS NOAA Weather Wire Service

GTS Global Telecommunications System

EMWIN Emergency Manager's Weather Information Network

3.3 FALSE ALARMS

Any time disaster response exercises are conducted, the potential exists for the public or media to interpret the event as real. During the exercise a few false alarms were received. Overall, the exercise proceeded smoothly without serious misconceptions by the media or the public.

3.4 RESOURCES

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

Before and during the exercise the task team (Table 3) were available to answer questions and provide guidance. The task team leader was Ms Christa von Hillebrandt from NOAA NWS CTWP.

Person	**Telephone #**	**Email**
Lorna Inniss, Chair	246-228-5950	linniss@coastal.gov.bb
Francisco Garces, Vice Chair	58-212-2575153	fgarces@funvisis.gob.ve
Frederique Martini, Vice Chair	Frederique.MARTINI@developpement-durable.gouv.fr	
Christa von Hillebrandt, Vice Chair; NWS CTWP Manager	787-833-8433	christa.vonh@noaa.gov
Emilio Talavera, Chair WG1	505-22492761	emilio.talavera@gf.ineter.gob.ni
Aurelio Mercado, Chair WG2	787-265-5461	aurelio.mercado@upr.edu
Rafael Mojica, Chair WG3	787-253-4586	rafael.mojica@noaa.gov
Dimas Alonso, Chair WG4	504-2290606 x401	alonzoaguadesastres@yahoo.com
Bernardo Aliaga, Technical Secretary	33-1-45683980	b.aliaga@unesco.org
Jeremy Collymore, Ex. Director CDEMA	246-425-0386	Jeremy.Collymore@cdema.org
Walter Wintzer, CEPREDENAC	502-2362-1981-83	wwintzer@sica.int
Ivan Morales, CEPREDENAC	502-2362-1981-83	imorales@sica.int
Melinda Bailey, NWS Southern Region	817-978-1100x107	melinda.bailey@noaa.gov
Wilfredo Ramos, PREMA Rep.	787-724-0124	wramos@aemead.gobierno.pr
Jacqueline Heyliger VITEMA Rep.	340-773-2244	jjheyliger@yahoo.com
Paul Whitmore WC/ATWC Director	907-745-4212	paul.whitmore@noaa.gov
Bill Knight WC/ATWC TWSO	907-745-4212	william.knight@noaa.gov

Person	Telephone #	Email
James Waddell WC/ATWC Rep.	907-745-4212	james.waddell@noaa.gov
Charles McCreery PTWC Director	808-689-8207	charles.mccreery@noaa.gov
Stuart Weinstein PTWC TWSO	808-689-8207	stuart.weinstein@noaa.gov
Gerard Fryer PTWC Rep.	808-689-8207	gerard.fryer@noaa.gov
Victor Huerfano PRSN Director	787-833-8433	victor@prsn.uprm.edu

Table.3 Task Team Contacts Information

3.5 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. In order to promote the local awareness of the tsunami hazards, there was a press release from NOAA and another one from UNESCO/IOC, in addition there were independent press releases from the participating countries (Annex III). Also there were offered dozens of talks and interviews to the public. Two sessions of Webinars were held from 18 to 20 January 2011, and also from 1 to 3 February 2011 for the participating agencies. These Webinar sessions were in Spanish and English. At least, five special websites were established by organizations to share information on the event, and more than 60 media reports were published before, during, and after the exercise.The media also played a key role in alerting the public and identifying strengths and gaps in the tsunami warning system.

4. POST-EXERCISE EVALUATION

All participating agencies were requested to provide brief feedback on the exercise. Agencies had to fill out an online evaluation questionnaire which was established for the participants to submit their comments. The CTWP was responsible for reviewing the submitted evaluations. The provided feedback was to assist the ICG/CARIBE-EWS, NTHMP, and NOAA in the evaluation of CARIBE WAVE 11/LANTEX 11 and the development of subsequent exercises, and help response agencies document lessons learned. In general, reports indicated some gaps in communications and the absolute need to reinforce preparedness, evacuation plans and involvement of the private sector in tsunami readiness.

5. REFERENCES

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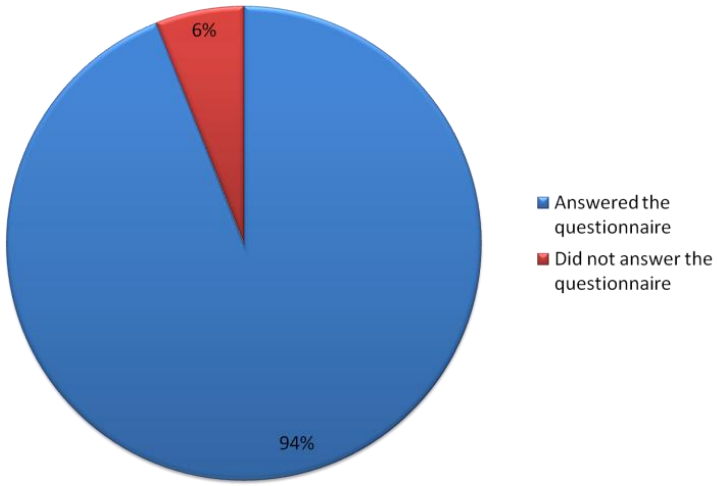
ANNEX I

COUNTRY REPORTS FOR CARIBE WAVE 2011

1. PARTICIPATION

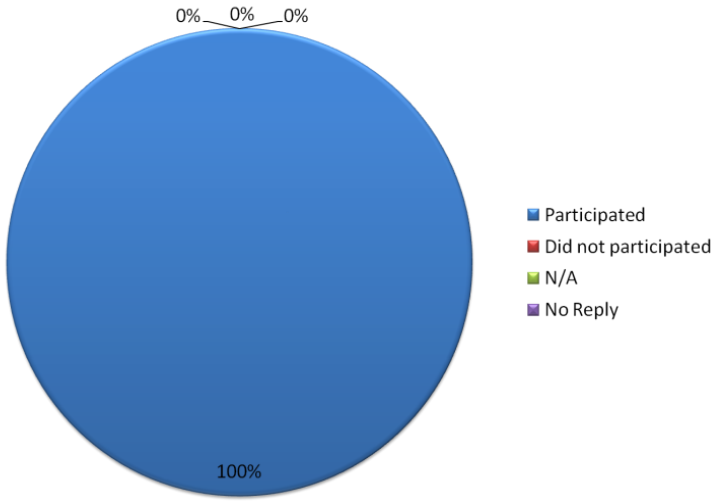
1.A PARTICIPATION OF COUNTRY/STATE/TERRITORIAL IN CARIBE WAVE 11/LANTEX 11

There were 34 participating countries in the exercise. Each participant country/state/territory had to fill out this questionnaire. There was a total of 32 questionnaires handed in by 34 countries (France only answered one questionnaire which included Martinique, Guadeloupe, and Saint Martin, which lowered the number of received questionnaires to 32). In other words, 94 % of the participating countries answered the questionnaire.



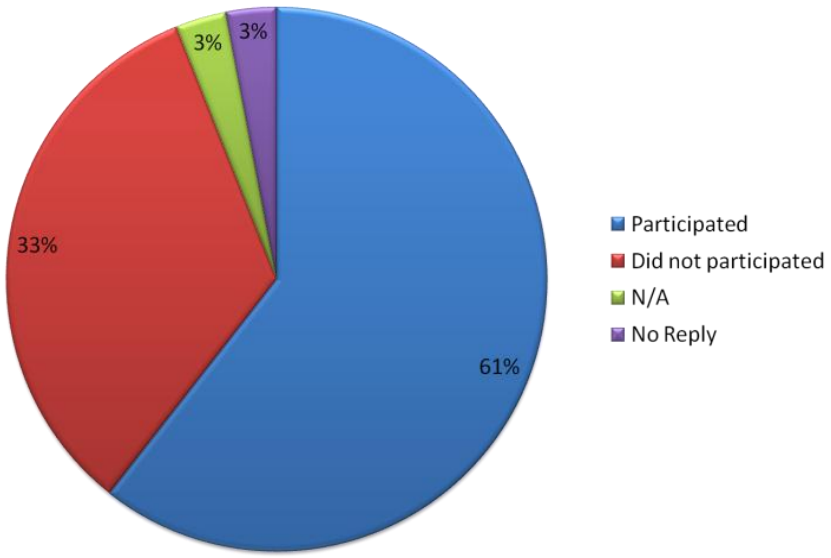
1.B PARTICIPATION OF OTHER NATIONAL/STATE/TERRITORIAL AGENCIES IN THE EXERCISE

There was 100 % participation of the other national/state/territorial agencies in the exercise. There were also international observers to the exercise.



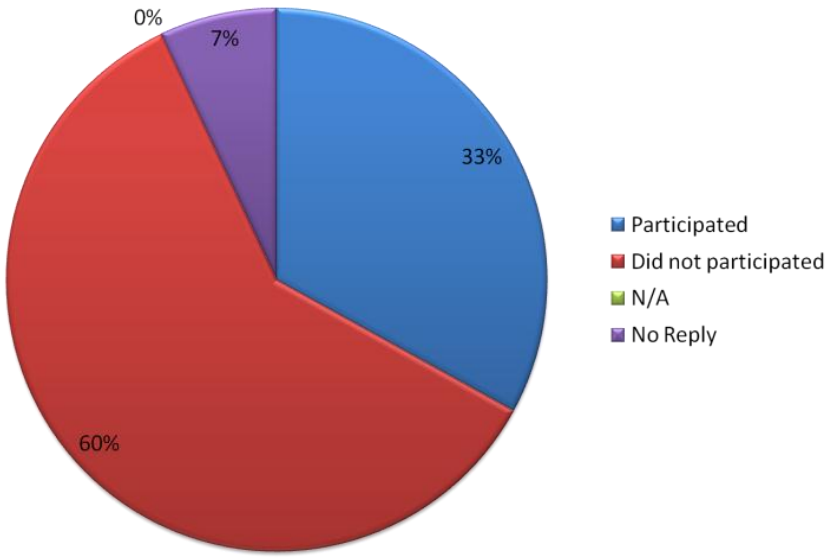
1.C PARTICIPATION OF LOCAL AGENCIES/COMMUNITIES IN THE EXERCISE

There was a 61 % participation of local agencies and communities in the exercise.



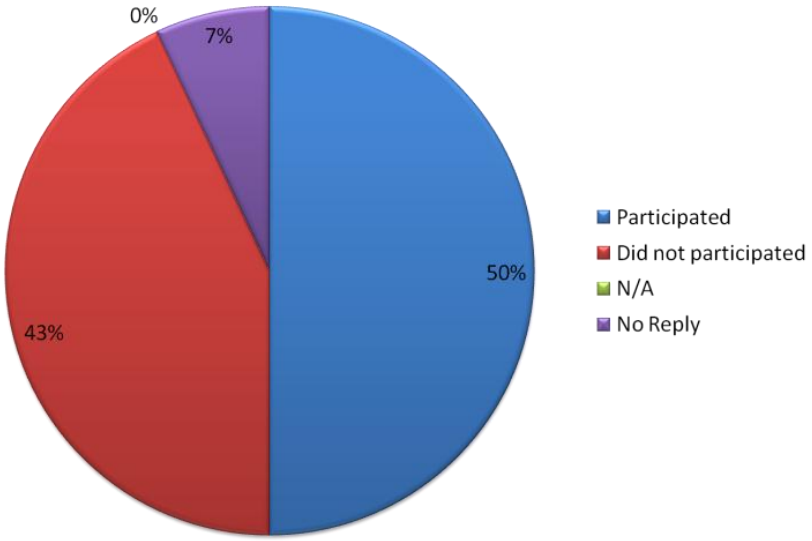
1.D PARTICIPATION OF SCHOOLS IN THE EXERCISE

Approximately 188 schools participated in the exercise, three countries indicated that they had schools that participated but did not specify the quantity, and two countries indicated that all the schools had participated in the exercise. This constitutes a 33 % of the participants having schools participation in the exercise.



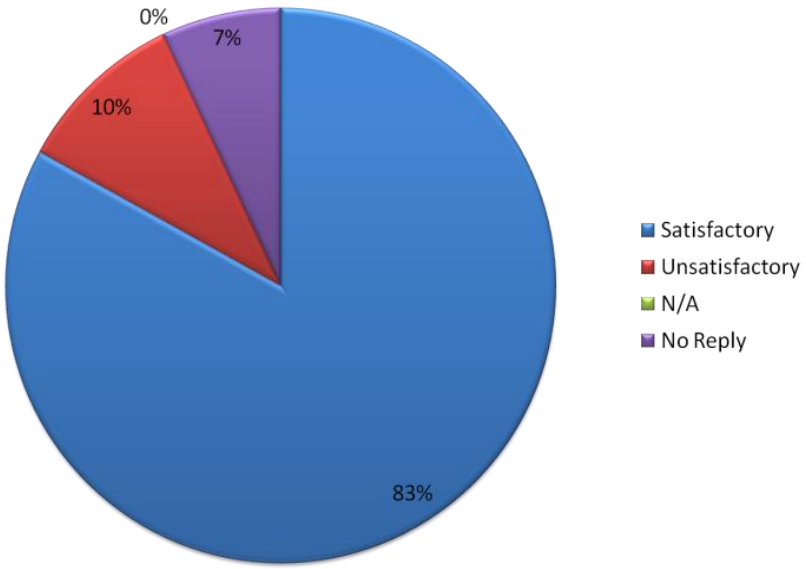
1.E PARTICIPATION OF PRIVATE ENTITIES IN THE EXERCISE

Approximately, 139 private entities participated in the exercise including hotels, port operators, and media outlets. This represents a 50 % of the countries having participation from the private sector.



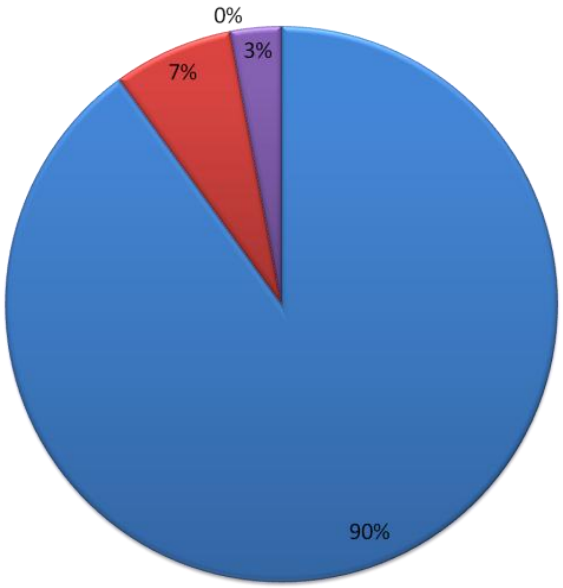
2. SATISFACTION WITH EXERCISE FORMAT

There was an 83 % participants' satisfaction with the exercise format, although commentaries regarding it were expressed. Some countries commented that they found the use of two earthquake events confusing. Also, there were complaints regarding the translation of alert levels in the text.



3. RECEPTION OF THE "DUMMY" MESSAGE FROM THE WC/ATWC OR PTWC TO START THE EXERCISE

The "dummy" message was the only live message issued over broadcast dissemination channels, and was the initial message to start the exercise. This first message was received thru: email, fax, phone, EMWIN, GTS, AFTN, and EAS. Ninety (90 %) per cent of the participating countries received the dummy message by any of these means.

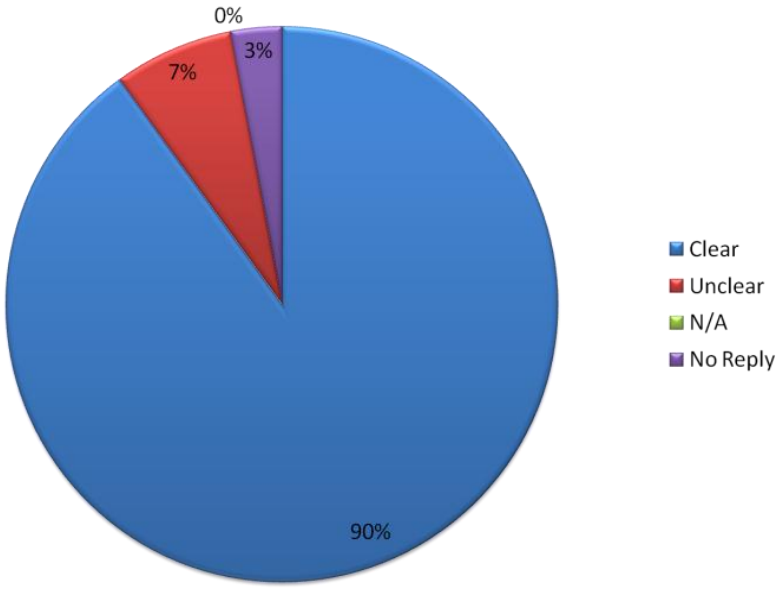


Distribution:

Email:	16
Fax:	12
Phone:	3
EMWIN:	3
GTS:	3
AFTN:	1
EAS:	1

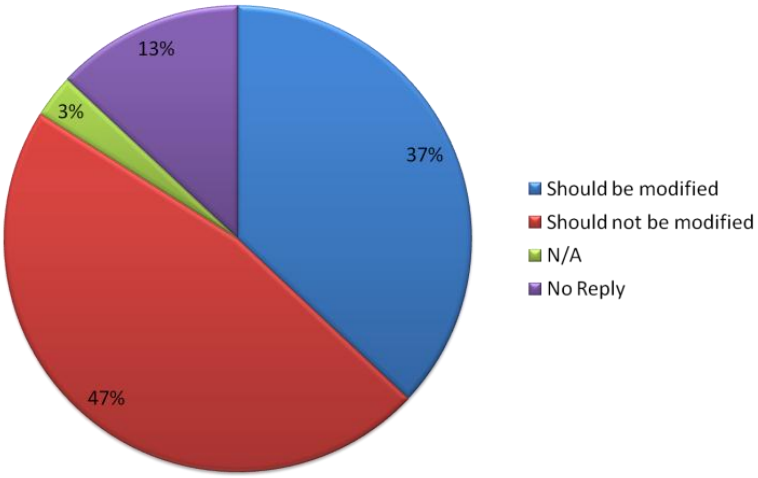
4. CLARITY OF THE CONTENT AND INTENTION OF THE TSUNAMI MESSAGE

Ninety (90 %) per cent of the participating countries indicated that the content and the intention of the tsunami messages were clear to them.



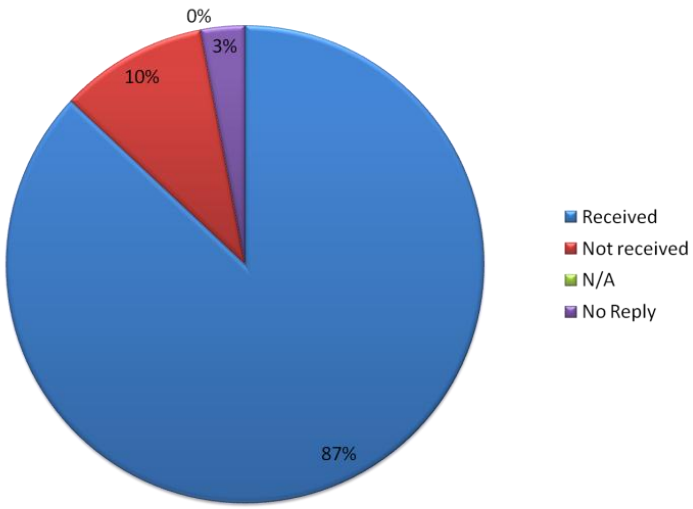
5. MESSAGES MODIFICATION TO ADD ANY OTHER CONTENT

Although 47 % of the participants answered that the messages should not be modified, in general, there were problems regarding the language of the issued messages, and recommendations to translate them into Spanish and French were received. There was also some confusion with the terms for alert. The agencies suggested adding more countries into the list for the calculations of the tsunami travel times and tsunami amplitudes. Also, there were requests to provide more detailed information on the impacts, and more information online.



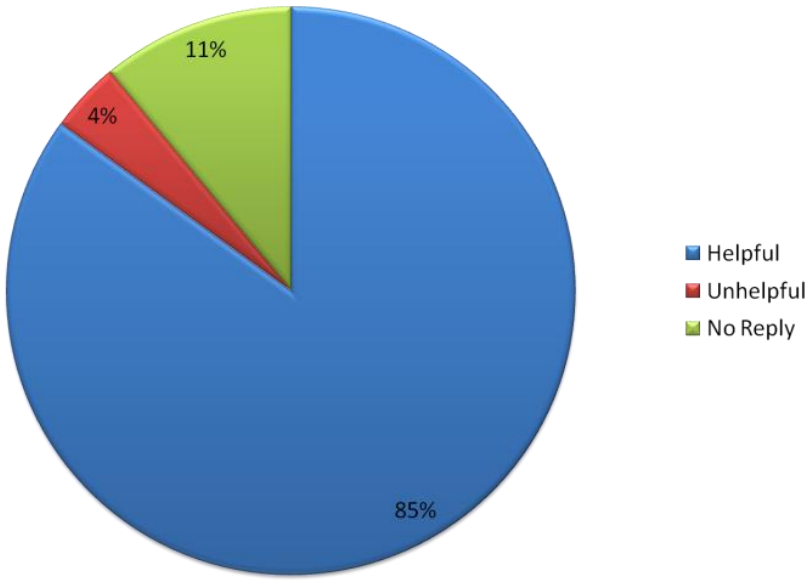
6. RECEPTION OF ALL THE OTHER EMAIL MESSAGES ISSUED BY THE WC/ATWC AND/OR PTWC DURING THE EXERCISE

During the exercise a series of email messages were issued by the WC/ATWC and/or PTWC to the subscribed agencies under a special list prepared for the exercise. These messages represented the official standard products that should be issued during a real event. No live messages, besides the “dummy” message, were issued. An 87 % of the participants received these issued messages.



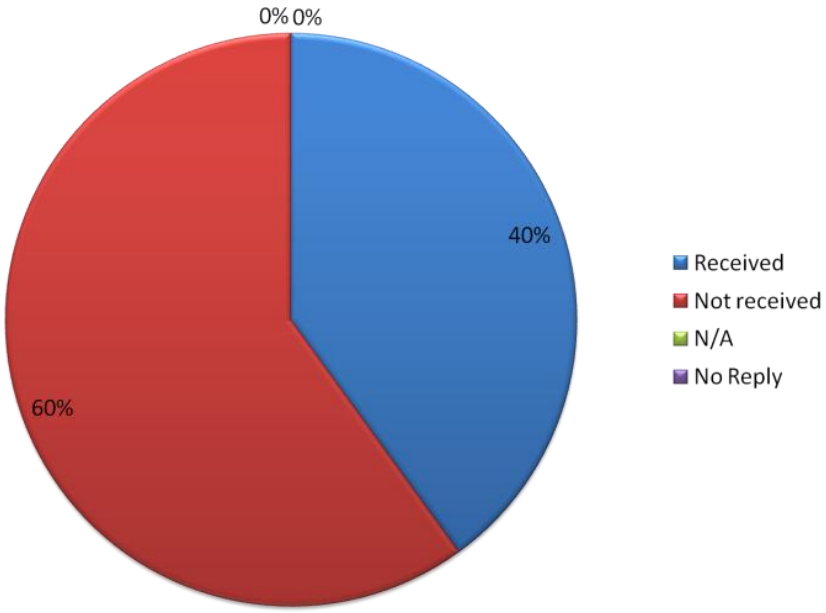
Helpfulness of the email messages issued by the WC/ATWC and/or PTWC during the exercise

An 85 % of the participants indicated that these issued messages were helpful during the exercise.



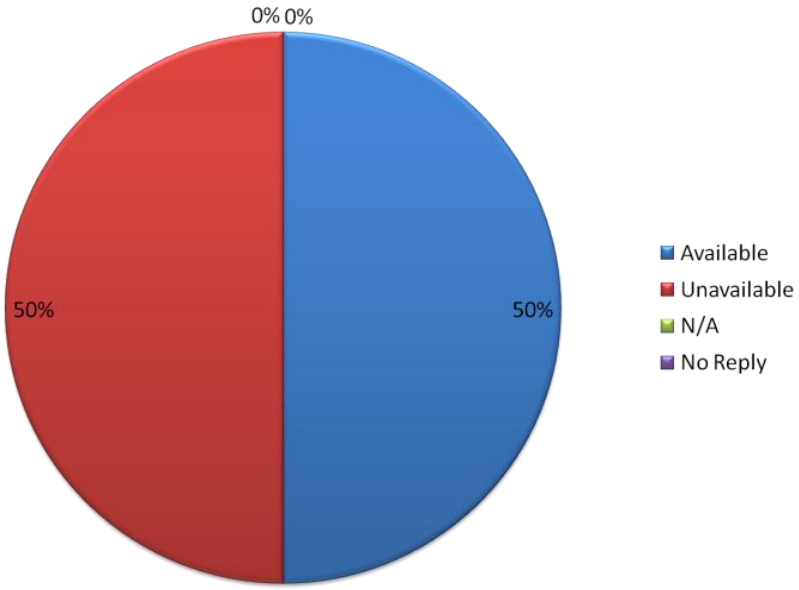
7. RECEPTION OF ANY MESSAGES FROM ORGANIZATIONS OTHER THAN THE WC/ATWC AND/OR PTWC

During the exercise other organizations issued tsunami messages throughout the Caribbean. Some of them were: CDEMA (Caribbean Emergency Management Agency), PRSN (Puerto Rico Seismic Network of the University of Puerto Rico at Mayagüez), INETER (Instituto Nicaragüense de Estudios Territoriales), Panamá Geoscience Institute, FUNVISIS (Fundación Venezolana de Investigaciones Sismológicas), Met Services, Navy, and Emergency Management Organizations. A 40% of the participating countries received the messages from organizations other than the WC/ATWC and/or PTWC.



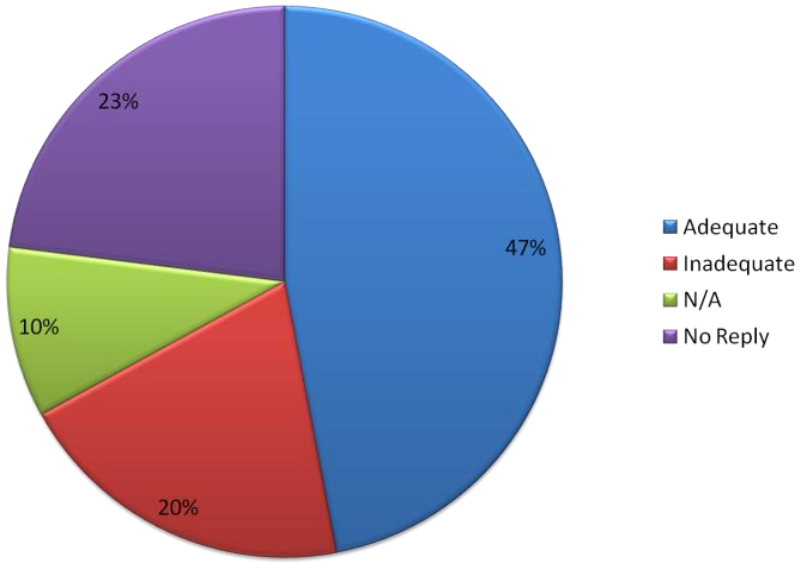
8. AGENCY AVAILABILITY OF A TSUNAMI RESPONSE PLAN IN PLACE PRIOR TO THE EXERCISE

Fifty (50 %) per cent of the participating countries had a tsunami response plan in place prior to the exercise.



9. ADEQUACY OF THE RESPONSE PLAN TO ADDRESS THE EVENT

There were a 47 % of the participants that indicated that their respective response plans were adequate to address the event.

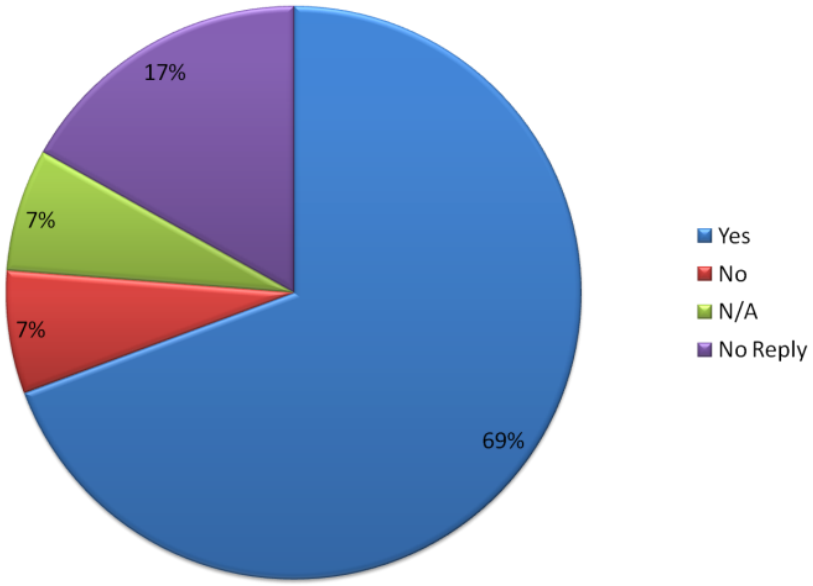


10. ACTIONS TAKEN BY THE AGENCY DURING THE EXERCISE:

Each agency decided the type of exercise they wanted to have. These types were: orientation exercise, drill, tabletop exercise, functional exercise, and full-scale exercise. During the exercise the different agencies held tabletop exercises, communication exercises, activation of the EOC's, seminars, and drills. There were also international observers to the exercise.

11. EMERGENCY MANAGEMENT ACTIONS DURING THE EVENT CLEARLY LAID OUT BY THE PLAN:

A 69 % of the participants indicated that their respective emergency management actions during the exercise were clearly laid out by the plan.



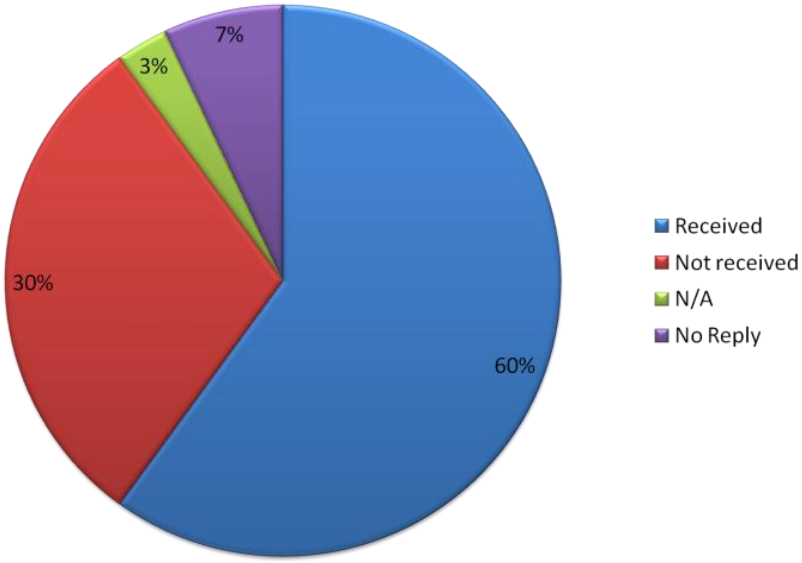
12. LIST OF THE MECHANISMS THAT WILL USE THE AGENCIES TO NOTIFY THE POPULATION OF ANY TSUNAMI DANGER IN CASE OF A REAL EVENT

The participants indicated the following as their mechanisms to notify the public of a tsunami theat:

- Radio, TV, Cable TV
- SMS
- Sirens
- Phone calls
- Emails
- Word of mouth
- Loudspeakers on emergency vehicles
- Social Media

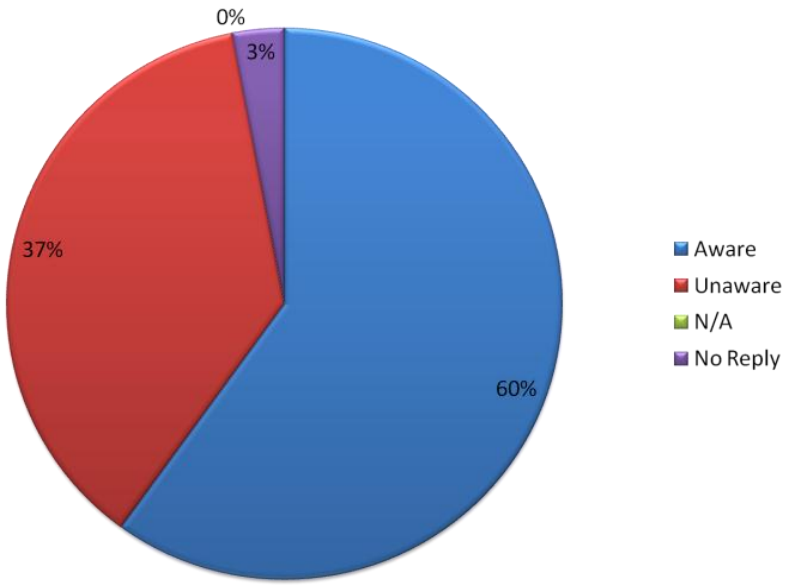
13. FEEDBACK RECEPTION FROM THE PUBLIC

There were requests from the public for more media involvement, and also, there were a few reported false messages circulating during the exercise. In general, 60 % of the participating countries indicated that they received feedback from the public community.



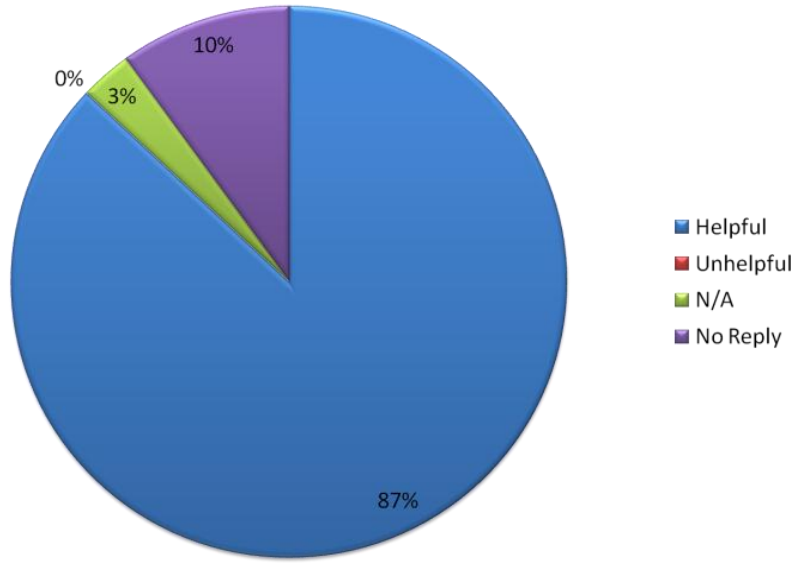
14. AWARENESS OF THE POTENTIAL TSUNAMI DANGER ZONES IN THE AREA

A 60 % of the participants indicated that they are aware of the potential tsunami danger zones in their area.



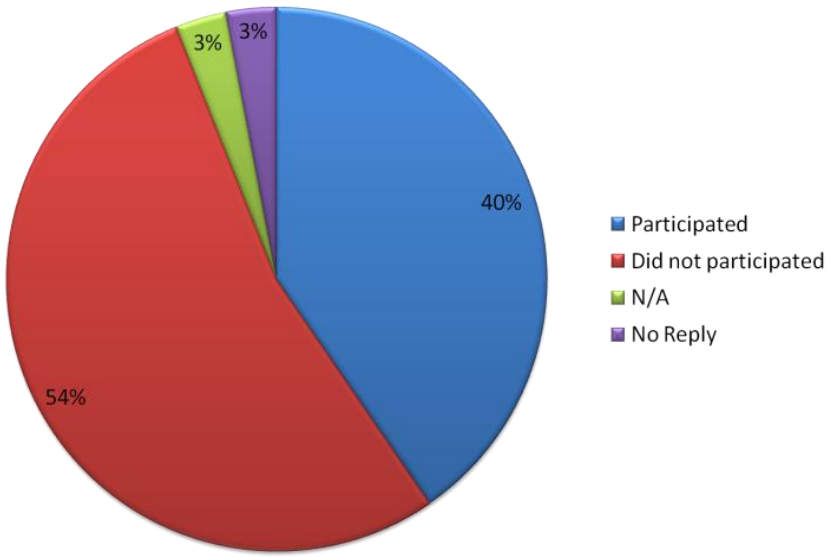
15. HELPFULNESS OF THE EXERCISE TO VALIDATE THE RESPONSE PLAN OR TO SHOW INSUFFICIENCIES

There were 87 % of the participants that indicated that the exercise was helpful on to validate their respective response plans and to show any insufficiencies that need to be address.



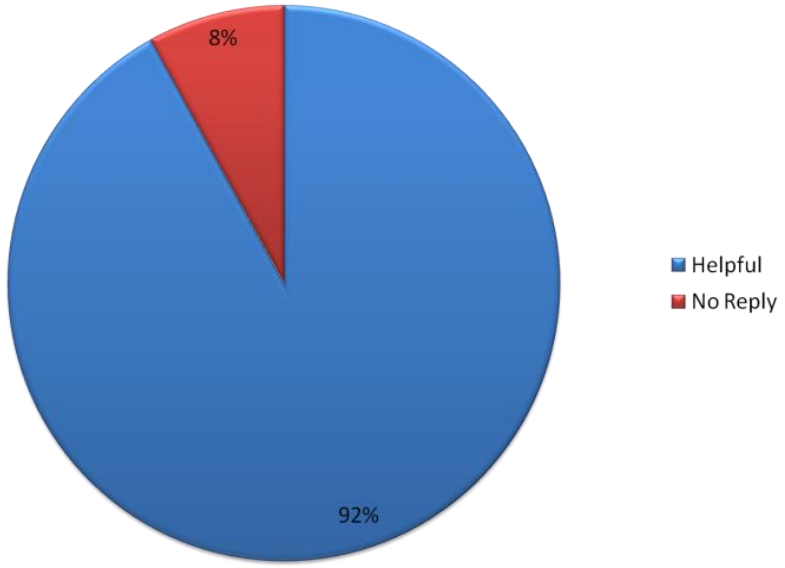
16. PARTICIPATION IN THE WEBINARS OFFERED PRIOR THE EXERCISE

A series of Webinars were offered prior the exercise to help the countries into the preparations. These were held from 18 to 20 January 2011, and also from 1 to 3 February 2011, both in Spanish and English. There was a 40 % participation of the countries in these Webinars.



Helpfulness of the Webinars for the exercise:

From all the participants of these Webinars, 92 % of them indicated that these were helpful in the preparations for the exercise and during it.



ANNEX II

TWC ISSUED DUMMY MESSAGES

WC/ATWC

WEXX20 PAAQ 231302

TSUAT1

TEST...TSUNAMI EXERCISE MESSAGE NUMBER 1...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
902 AM AST WED MAR 23 2011
...CARIBE WAVE 11/LANTEX 11 TSUNAMI EXERCISE MESSAGE. REFER TO WC/ATWC MESSAGE 1 IN THE EXERCISE HANDBOOK. THIS IS AN EXERCISE ONLY...

THIS MESSAGE IS BEING USED TO START THE CARIBE WAVE 11/LANTEX 11 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 WC/ATWC.ARH.NOAA.GOV. THE EXERCISE PURPOSE IS TO PROVIDE EMERGENCY MANAGEMENT A REALISTIC SCENARIO TO TEST TSUNAMI RESPONSE PLANS.

THIS IS ONLY AN EXERCISE.

$$

PTWC

WECA41 PHEB 231302

TSUCAX

TEST...TSUNAMI EXERCISE MESSAGE NUMBER 1...TEST
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1302Z 23 MAR 2011
...CARIBE WAVE 11/LANTEX 11 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 11/LANTEX 11 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 WC/ATWC.ARH.NOAA.GOV. THE EXERCISE PURPOSE IS TO PROVIDE EMERGENCY MANAGEMENT A REALISTIC SCENARIO TO TEST TSUNAMI RESPONSE PLANS.
THIS IS ONLY AN EXERCISE.

$$

ANNEX III

TWC ISSUED EXERCISE MESSAGES

The following messages, created for the CARIBE WAVE 11/LANTEX 11 tsunami exercise, are representative of the official standard products issued by the WC/ATWC and PTWC during a large magnitude 7.6 earthquake and tsunami originating 25 miles southeast of Fajardo, Puerto Rico and 60 miles southeast of San Juan, Puerto Rico at 18.2oN, 65.3oW.

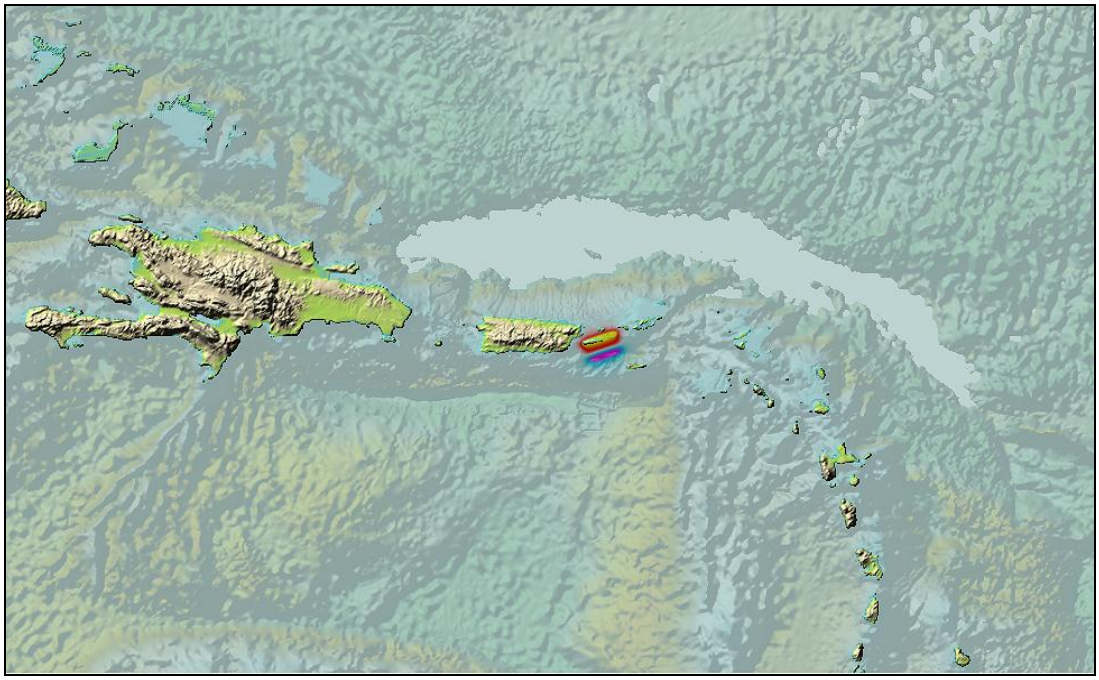


Figure III.1: Tsunami source at zero minute

WC/ATWC Message #1

WEXX20 PAAQ 231302
TSUAT1

BULLETIN
TEST...TSUNAMI MESSAGE NUMBER 1...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
902 AM AST WED MAR 23 2011

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

...A TEST TSUNAMI WARNING IS NOW IN EFFECT FOR PUERTO RICO AND
THE VIRGIN ISLANDS...

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

BROWNSVILLE TEXAS TO CAPE CHIDLEY LABRADOR...

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

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE - 7.6
TIME - 0900 EDT MAR 23 2011
0900 AST MAR 23 2011
0800 CDT MAR 23 2011
1300 UTC MAR 23 2011
LOCATION - 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
DEPTH - 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED MAINLY ON EARTHQUAKE DATA. EARTHQUAKES OF THIS SIZE OFTEN GENERATE DANGEROUS TSUNAMIS. AS MORE INFORMATION BECOMES AVAILABLE THE WARNING AREAS WILL BE REFINED.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231402-
/T.NEW.PAAQ.TS.W.0003.110323T1302Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
902 AM AST WED MAR 23 2011

...A TEST TSUNAMI WARNING IS NOW IN EFFECT FOR PUERTO RICO AND
THE VIRGIN ISLANDS...

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

TSUNAMI WARNINGS MEAN THAT A TSUNAMI WITH SIGNIFICANT WIDESPREAD INUNDATION IS IMMINENT OR EXPECTED. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL

TIME. ESTIMATED TIMES OF INITIAL WAVE ARRIVAL FOR SELECTED
SITES IN THE WARNING ARE PROVIDED BELOW.

CHRISTIANSTED-VI 0911 AST MAR 23 MAYAGUEZ-PR 0952 AST MAR 23
SAN JUAN-PR 0945 AST MAR 23 CHARLOT AMALI-VI 0955 AST MAR 23
FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WC/ATWC.ARH.NOAA.GOV

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

$$

PTWC Message #1

WECA41 PHEB 231302
TSUCAX

TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1302Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT
PUERTO RICO AND THE VIRGIN ISLANDS. THE WEST COAST/
ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR
THESE AREAS.

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

A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS -
MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT
MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE -
CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA -
HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA -
TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE - 7.6
TIME - 1300 UTC MAR 23 2011
LOCATION - 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
DEPTH - 56 MILES/90 KM

EVALUATION
EARTHQUAKES OF THIS SIZE HAVE THE POTENTIAL TO GENERATE A
DESTRUCTIVE LOCAL TSUNAMI AND SOMETIMES A DESTRUCTIVE REGIONAL
TSUNAMI ALONG COASTS LOCATED USUALLY NO MORE THAN A THOUSAND

KILOMETRES FROM THE EARTHQUAKE EPICENTER. AREAS FURTHER FROM THE EPICENTER COULD EXPERIENCE NON-DAMAGING SEA LEVEL CHANGES AND STRONG OR UNUSUAL COASTAL CURRENTS.

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

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

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES	ARRIVAL TIME
SAINT MAARTEN	SIMPSON BAAI	18.0N 63.1W	1336Z MAR23
SABA	NETH ANTILLES	17.6N 63.2W	1338Z MAR23
ST EUSTATIUS	NETH ANTILLES	17.5N 63.0W	1344Z MAR23
ANGUILLA	THE VALLEY	18.3N 63.1W	1345Z MAR23
SAINT KITTS	BASSETERRE	17.3N 62.7W	1352Z MAR23
MONTSERRAT	PLYMOUTH	16.7N 62.2W	1354Z MAR23
DOMINICAN REP	CABO ENGANO	18.6N 68.3W	1354Z MAR23
GUADELOUPE	BASSE-TERRE	16.0N 61.7W	1401Z MAR23
DOMINICAN REP	SANTO DOMINGO	18.5N 69.9W	1402Z MAR23
DOMINICA	ROSEAU	15.3N 61.4W	1404Z MAR23
SAINT MARTIN	BAIE BLANCHE	18.1N 63.0W	1405Z MAR23
BARBUDA	PALMETTO POINT	17.6N 61.9W	1410Z MAR23
MARTINIQUE	FORT-DE-FRANCE	14.6N 61.1W	1411Z MAR23
SAINT LUCIA	CASTRIES	14.0N 61.0W	1412Z MAR23
DOMINICAN REP	PUERTO PLATA	19.8N 70.7W	1413Z MAR23
BONAIRE	ONIMA	12.3N 68.3W	1414Z MAR23
CURACAO	WILLEMSTAD	12.1N 68.9W	1418Z MAR23
TURKS N CAICOS	GRAND TURK	21.5N 71.1W	1418Z MAR23
ST VINCENT	KINGSTOWN	13.1N 61.2W	1419Z MAR23
ANTIGUA	SAINT JOHNS	17.1N 61.9W	1425Z MAR23
GRENADA	SAINT GEORGES	12.0N 61.8W	1428Z MAR23
HAITI	CAP-HAITEN	19.8N 72.2W	1430Z MAR23
ARUBA	ORANJESTAD	12.5N 70.0W	1433Z MAR23
TURKS N CAICOS	WEST CAICOS	21.7N 72.5W	1434Z MAR23
VENEZUELA	MAIQUETIA	10.6N 67.0W	1436Z MAR23
BAHAMAS	MAYAGUANA	22.3N 73.0W	1437Z MAR23
BARBADOS	BRIDGETOWN	13.1N 59.6W	1439Z MAR23
VENEZUELA	CUMANA	10.5N 64.2W	1442Z MAR23
BAHAMAS	GREAT INAGUA	20.9N 73.7W	1444Z MAR23
CUBA	BARACOA	20.4N 74.5W	1448Z MAR23
HAITI	JEREMIE	18.6N 74.1W	1450Z MAR23
TRINIDAD TOBAGO	PIRATES BAY	11.3N 60.6W	1451Z MAR23
BAHAMAS	SAN SALVADOR	24.1N 74.5W	1452Z MAR23
BAHAMAS	CROOKED IS	22.7N 74.1W	1455Z MAR23

CUBA	SANTIAGO D CUBA	19.9N 75.8W	1458Z MAR23
COLOMBIA	SANTA MARTA	11.2N 74.2W	1501Z MAR23
COLOMBIA	RIOHACHA	11.6N 72.9W	1501Z MAR23
COLOMBIA	BARRANQUILLA	11.1N 74.9W	1504Z MAR23
BAHAMAS	ELEUTHERA IS	25.2N 76.1W	1507Z MAR23
CUBA	GIBARA	21.1N 76.1W	1508Z MAR23
JAMAICA	MONTEGO BAY	18.5N 77.9W	1516Z MAR23
COLOMBIA	CARTEGENA	10.4N 75.6W	1516Z MAR23
BAHAMAS	NASSAU	25.1N 77.4W	1519Z MAR23
VENEZUELA	PUNTO FIJO	11.7N 70.2W	1521Z MAR23
JAMAICA	KINGSTON	17.9N 76.9W	1525Z MAR23
BAHAMAS	ABACO IS	26.6N 77.1W	1525Z MAR23
HAITI	PORT-AU-PRINCE	18.5N 72.4W	1527Z MAR23
VENEZUELA	PORLAMAR	10.9N 63.8W	1529Z MAR23
TRINIDAD TOBAGO	PORT-OF-SPAIN	10.6N 61.5W	1541Z MAR23
BAHAMAS	FREEPORT	26.5N 78.8W	1542Z MAR23
CUBA	CIENFUEGOS	22.0N 80.5W	1552Z MAR23
VENEZUELA	GOLFO VENEZUELA	11.4N 71.2W	1554Z MAR23
COLOMBIA	PUNTA CARIBANA	8.6N 76.9W	1600Z MAR23
CUBA	SANTA CRZ D SUR	20.7N 78.0W	1703Z MAR23
CUBA	LA HABANA	23.2N 82.4W	1703Z MAR23
CUBA	NUEVA GERONA	21.9N 82.8W	1806Z MAR23
GUYANA	GEORGETOWN	6.8N 58.2W	1812Z MAR23

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

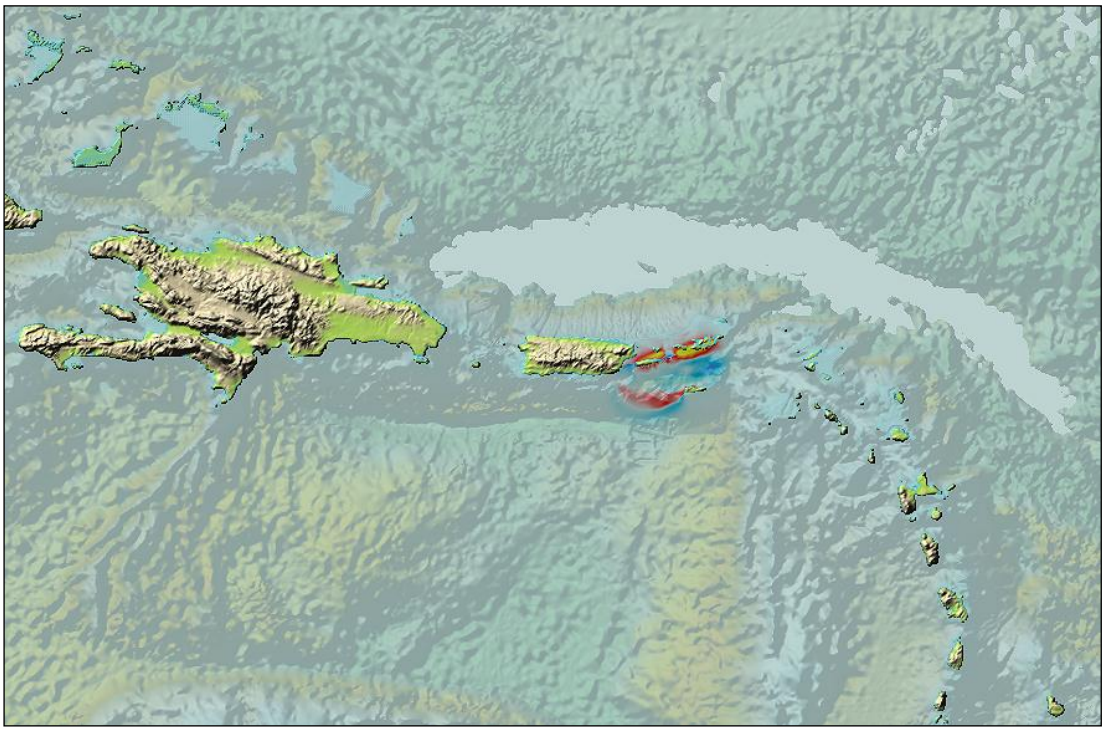


Figure III.2: Tsunami at ten minutes.

WC/ATWC Message #2

WEXX20 PAAQ 231332
TSUAT1

BULLETIN
TEST...TSUNAMI MESSAGE NUMBER 2...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
932 AM AST WED MAR 23 2011

THIS MESSAGE CONTAINS NEW OBSERVATIONS AND INFORMATION ON AN AFTERSHOCK.

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...

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

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

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

A 7.6 MW AFTERSHOCK WAS RECORDED AT 1305 UTC - 5 MINUTES AFTER THE INITIAL QUAKE. ITS EPICENTER WAS POSITIONED AT 18.36N 64.73W. FIGURES WITHIN WC/ATWC MESSAGES REFLECT THE IMPACT OF BOTH QUAKES ON THE EVENT.
A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES

LOCATION	LAT	LON	TIME	AMPL
CHRISTIANSTED VI	17.7N	64.7W	906 AST	8.23 FT/2.51 M
LIMETREE BAY VI	17.6N	64.6W	909 AST	15.41 FT/4.70 M
CHARLOTTE AMALIE VI	18.3N	65.0W	909 AST	8.83 FT/2.69 M
LAMESHUR BAY VI	18.3N	64.7W	918 AST	9.37 FT/2.86 M
CULEBRA PR	18.3N	65.3W	921 AST	6.79 FT/2.07 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

WAVES OF THIS SIZE ARE KNOWN TO CAUSE INUNDATION AND DAMAGE TO

COASTAL STRUCTURES. TSUNAMIS ARE EXPECTED TO CONTINUE AT DANGEROUS LEVELS FOR AT LEAST TWO HOURS. A 15.0-FOOT/4.6-METRE TSUNAMI IN LIMETREE BAY VI WAS WITNESSED TEARING THE BOARDS FROM A LOCAL PIER AND PUSHING THREE BOATS ASHORE.

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE - 7.6
TIME – 0900 EDT MAR 23 2011
0900 AST MAR 23 2011
0800 CDT MAR 23 2011
1300 UTC MAR 23 2011
LOCATION – 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
DEPTH – 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231432-
/T.CON.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
932 AM AST WED MAR 23 2011

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

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

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

CHRISTIANSTED-VI 0911 AST MAR 23 MAYAGUEZ-PR 0952 AST MAR 23
SAN JUAN-PR 0945 AST MAR 23 CHARLOT AMALI-VI 0955 AST MAR 23

FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WC/ATWC.ARH.NOAA.GOV

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

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WC/ATWC Message #3

WEXX20 PAAQ 231401
TSUAT1

BULLETIN
TEST...TSUNAMI MESSAGE NUMBER 3...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1001 AM AST WED MAR 23 2011

THIS MESSAGE CONTAINS MORE OBSERVED TSUNAMI AMPLITUDES AND DAMAGE INFORMATION.

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...

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

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

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES

LOCATION	LAT	LON	TIME	AMPL
CHRISTIANSTED VI	17.7N	64.7W	906 AST	8.23 FT/2.51 M
LIMETREE BAY VI	17.6N	64.6W	909 AST	15.41 FT/4.70 M
LAMESHUR BAY VI	18.3N	64.7W	918 AST	9.37 FT/2.86 M
VIRGIN GORDA BVI	18.5N	64.5W	919 AST	4.59 FT/1.40 M
CULEBRA PR	18.3N	65.3W	921 AST	6.79 FT/2.07 M
CHARLOTTE AMALIE VI	18.4N	64.9W	945 AST	8.27 FT/2.52 M
MONA ISLAND PR	18.1N	67.9W	948 AST	0.85 FT/0.26 M
MAGUEYES ISLAND PR	18.2N	67.2W	951 AST	2.48 FT/0.76 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

INITIAL DAMAGE REPORTS NOTE FLOODED STREETS IN CHRISTIANSTED VI
AND MANY HOMES TORN FROM THE FOUNDATIONS IN LIMETREE BAY VI.

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE – 7.6

TIME–	0900 EDT MAR 23 2011
	0900 AST MAR 23 2011
	0800 CDT MAR 23 2011
	1300 UTC MAR 23 2011
LOCATION–	18.2 NORTH 65.3 WEST
	25 MILES/40 KM SE OF FAJARDO PUERTO RICO
	60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
DEPTH–	56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI
AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231501-
/T.CON.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1001 AM AST WED MAR 23 2011

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

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

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

SITES IN THE WARNING ARE PROVIDED BELOW.

CHRISTIANSTED-VI 0911 AST MAR 23 MAYAGUEZ-PR 0952 AST MAR 23
SAN JUAN-PR 0945 AST MAR 23 CHARLOT AMALI-VI 0955 AST MAR 23
FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WC/ATWC.ARH.NOAA.GOV

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

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PTWC Message #2

WECA41 PHEB 231401
TSUCAX

TSUNAMI MESSAGE NUMBER 2
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1401Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT PUERTO RICO AND THE VIRGIN ISLANDS. THE WEST COAST/ ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR THESE AREAS.

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

A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS - MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE - CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA - HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA - TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE – 7.6
TIME– 1300 UTC MAR 23 2011
LOCATION– 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
DEPT– 56 MILES/90 KM

MEASUREMENTS OR REPORTS OF TSUNAMI ACTIVITY

LOCATION	LAT	LON	TIME	AMPL
CHRISTIANSTED VI	17.7N	64.7W	1306Z	8.23 FT/2.51 M
LIMETREE BAY VI	17.6N	64.6W	1309Z	15.41 FT/4.70 M
LAMESHUR BAY VI	18.3N	64.7W	1318Z	9.37 FT/2.86 M
VIRGIN GORDA BVI	18.5N	64.5W	1319Z	4.59 FT/1.40 M
CULEBRA PR	18.3N	65.3W	1321Z	6.79 FT/2.07 M
CHARLOTTE AMALIE VI	18.4N	64.9W	1345Z	8.27 FT/2.52 M
MONA ISLAND PR	18.1N	67.9W	1348Z	0.85 FT/0.26 M
MAGUEYES ISLAND PR	18.2N	67.2W	1351Z	2.48 FT/0.76 M
BASSETERRE SAINT KITTS	17.3N	62.7W	1352Z	3.21 FT/1.00 M
PLYMOUTH MONTSERRAT	16.7N	62.2W	1355Z	1.66 FT/0.51 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

SEVERE DAMAGE HAS BEEN REPORTED IN CHRISTIANSTED VI WITH NOTED FLOODING AS FAR INLAND AS ROUTE 70. HOTEL ON THE CAY LOCATED WITHIN THE HARBOR IS REPORTED AS TOTALLY DESTROYED WITH SEVERAL PEOPLE REPORTED AS MISSING. WITNESSES NEAR LIMETREE BAY VI REPORT A 15+ FOOT WAVE INUNDATING THE TANK FARM AT JERUSALEM AND FIGTREE HILL RESULTING IN LEAKING FUEL. AN OIL SLICK HAS BEEN NOTED IN THE AREA THAT IS 3-MILES LONG BY 500-FEET WIDE. TWO TANKS AT THE FARM ARE CURRENTLY ON FIRE AND MANY EMPLOYEES AT THE FACILITY ARE REPORTED MISSING. THE WAVE IN THIS AREA IS REPORTED TO HAVE GONE PAST ROUTE 66 AND AS FAR INLAND AS ROUTE 707. THE HENRY E. ROHLSEN AIRPORT REPORTS FLOODING ON THE RUNWAY AND IS CURRENTLY NOT OPERATING. COMMUNICATIONS WITH COUNTRIES IN THE NORTHEASTERN CARIBBEAN IS VERY SPORADIC AND DAMAGE AND INUNDATION REPORTS ARE NOW JUST COMING IN.

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

THE THREAT MAY CONTINUE FOR COASTAL AREAS LOCATED WITHIN ABOUT A THOUSAND KILOMETRES OF THE EARTHQUAKE EPICENTER. 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.

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

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES

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

LOCATION	COORDINATES	ARRIVAL TIME
SAINT MAARTEN	SIMPSON BAAI	18.0N 63.1W 1336Z MAR23
SABA	NETH ANTILLES	17.6N 63.2W 1338Z MAR23
ST EUSTATIUS	NETH ANTILLES	17.5N 63.0W 1344Z MAR23
ANGUILLA	THE VALLEY	18.3N 63.1W 1345Z MAR23
SAINT KITTS	BASSETERRE	17.3N 62.7W 1352Z MAR23
MONTSERRAT	PLYMOUTH	16.7N 62.2W 1354Z MAR23
DOMINICAN REP	CABO ENGANO	18.6N 68.3W 1354Z MAR23
GUADELOUPE	BASSE-TERRE	16.0N 61.7W 1401Z MAR23
DOMINICAN REP	SANTO DOMINGO	18.5N 69.9W 1402Z MAR23
DOMINICA	ROSEAU	15.3N 61.4W 1404Z MAR23
SAINT MARTIN	BAIE BLANCHE	18.1N 63.0W 1405Z MAR23
BARBUDA	PALMETTO POINT	17.6N 61.9W 1410Z MAR23
MARTINIQUE	FORT-DE-FRANCE	14.6N 61.1W 1411Z MAR23
SAINT LUCIA	CASTRIES	14.0N 61.0W 1412Z MAR23
DOMINICAN REP	PUERTO PLATA	19.8N 70.7W 1413Z MAR23
BONAIRE	ONIMA	12.3N 68.3W 1414Z MAR23
CURACAO	WILLEMSTAD	12.1N 68.9W 1418Z MAR23
TURKS N CAICOS	GRAND TURK	21.5N 71.1W 1418Z MAR23
ST VINCENT	KINGSTOWN	13.1N 61.2W 1419Z MAR23
ANTIGUA	SAINT JOHNS	17.1N 61.9W 1425Z MAR23
GRENADA	SAINT GEORGES	12.0N 61.8W 1428Z MAR23
HAITI	CAP-HAITEN	19.8N 72.2W 1430Z MAR23
ARUBA	ORANJESTAD	12.5N 70.0W 1433Z MAR23
TURKS N CAICOS	WEST CAICOS	21.7N 72.5W 1434Z MAR23
VENEZUELA	MAIQUETIA	10.6N 67.0W 1436Z MAR23
BAHAMAS	MAYAGUANA	22.3N 73.0W 1437Z MAR23
BARBADOS	BRIDGETOWN	13.1N 59.6W 1439Z MAR23
VENEZUELA	CUMANA	10.5N 64.2W 1442Z MAR23
BAHAMAS	GREAT INAGUA	20.9N 73.7W 1444Z MAR23
CUBA	BARACOA	20.4N 74.5W 1448Z MAR23
HAITI	JEREMIE	18.6N 74.1W 1450Z MAR23
TRINIDAD TOBAGO	PIRATES BAY	11.3N 60.6W 1451Z MAR23
BAHAMAS	SAN SALVADOR	24.1N 74.5W 1452Z MAR23
BAHAMAS	CROOKED IS	22.7N 74.1W 1455Z MAR23
CUBA	SANTIAGO D CUBA	19.9N 75.8W 1458Z MAR23
COLOMBIA	SANTA MARTA	11.2N 74.2W 1501Z MAR23
COLOMBIA	RIOHACHA	11.6N 72.9W 1501Z MAR23
COLOMBIA	BARRANQUILLA	11.1N 74.9W 1504Z MAR23
BAHAMAS	ELEUTHERA IS	25.2N 76.1W 1507Z MAR23
CUBA	GIBARA	21.1N 76.1W 1508Z MAR23
JAMAICA	MONTEGO BAY	18.5N 77.9W 1516Z MAR23
COLOMBIA	CARTEGENA	10.4N 75.6W 1516Z MAR23
BAHAMAS	NASSAU	25.1N 77.4E 1519Z MAR23
VENEZUELA	PUNTO FIJO	11.7N 70.2W 1521Z MAR23
JAMAICA	KINGSTON	17.9N 76.9W 1525Z MAR23
BAHAMAS	ABACO IS	26.6N 77.1W 1525Z MAR23
HAITI	PORT-AU-PRINCE	18.5N 72.4W 1527Z MAR23
VENEZUELA	PORLAMAR	10.9N 63.8W 1529Z MAR23
TRINIDAD TOBAGO	PORT-OF-SPAIN	10.6N 61.5W 1541Z MAR23

BAHAMAS	FREEPORT	26.5N	78.8W	1542Z MAR23
CUBA	CIENFUEGOS	22.0N	80.5W	1552Z MAR23
VENEZUELA	GOLFO VENEZUELA	11.4N	71.2W	1554Z MAR23
COLOMBIA	PUNTA CARIBANA	8.6N	76.9W	1600Z MAR23
CUBA	SANTA CRZ D SUR	20.7N	78.0W	1703Z MAR23
CUBA	LA HABANA	23.2N	82.4W	1703Z MAR23
CUBA	NUEVA GERONA	21.9N	82.8W	1806Z MAR23
GUYANA	GEORGETOWN	6.8N	58.2W	1812Z MAR23

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

WC/ATWC Message #4

WEXX20 PAAQ 231431
TSUAT1

BULLETIN
TEST...TSUNAMI MESSAGE NUMBER 4...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1031 AM AST WED MAR 23 2011

THIS MESSAGE CONTAINS UPDATED TSUNAMI OBSERVATIONS AND DAMAGE INFORMATION.

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...

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

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

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES

LOCATION	LAT	LON	TIME	AMPL
CHRISTIANSTED VI	17.7N	64.7W	906 AST	8.23 FT/2.51 M
LIMETREE BAY VI	17.6N	64.6W	909 AST	15.41 FT/4.70 M
LAMESHUR BAY VI	18.3N	64.7W	918 AST	9.37 FT/2.86 M
VIRGIN GORDA BVI	18.5N	64.5W	919 AST	4.59 FT/1.40 M
CULEBRA PR	18.3N	65.3W	921 AST	6.79 FT/2.07 M
CHARLOTTE AMALIE VI	18.4N	64.9W	945 AST	8.27 FT/2.52 M
MONA ISLAND PR	18.1N	67.9W	948 AST	0.85 FT/0.26 M
MAGUEYES ISLAND PR	18.2N	67.2W	951 AST	2.48 FT/0.76 M
SAN JUAN PR	18.5N	66.1W	1005 AST	1.94 FT/0.59 M
MAYAGUEZ PR	18.2N	67.1W	1008 AST	0.66 FT/0.20 M
AGUADILLA PR	18.4N	67.1W	1027 AST	4.82 FT/1.47 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

A 15.0-FOOT/4.6-METRE TSUNAMI IN LIMETREE BAY VI HAS TORN BOARDS FROM A PIER AND PUSHED THREE BOATS ASHORE. TWO PEOPLE ARE REPORTED DEAD FROM DROWNING IN CHRISTIANSTED VI AND TWO SEASIDE HOMES IN LAMESHUR BAY VI HAVE BEEN TORN FROM THE FOUNDATIONS.

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE – 7.6
TIME – 0900 EDT MAR 23 2011
0900 AST MAR 23 2011
0800 CDT MAR 23 2011
1300 UTC MAR 23 2011
LOCATION – 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
DEPTH – 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-

VIZ001-002-231531-
/T.CON.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1031 AM AST WED MAR 23 2011

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

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

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

SAN JUAN-PR 0945 AST MAR 23 CHARLOT AMALI-VI 0955 AST MAR 23
MAYAGUEZ-PR 0952 AST MAR 23
FOR ARRIVAL TIMES AT ADDITIONAL LOCATIONS SEE
WC/ATWC.ARH.NOAA.GOV

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

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WC/ATWC Message #5

WEXX20 PAAQ 231500
TSUAT1

BULLETIN
TEST...TSUNAMI MESSAGE NUMBER 5...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1100 AM AST WED MAR 23 2011

THIS MESSAGE CONTAINS UPDATED TSUNAMI OBSERVATIONS AND
DAMAGE INFORMATION.

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

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

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VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

THREE PIERS AND MULTIPLE BOATS ARE REPORTEDLY DAMAGED IN SAN JUAN PR. LARGE WAVES CONTINUE TO BE REPORTED IN ALL AFFECTED AREAS OF PUERTO RICO... U.S. VIRGIN ISLANDS AND BRITISH VIRGIN ISLANDS.

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VIZ001-002-231600-
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1100 AM AST WED MAR 23 2011

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

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PTWC Message #3

WECA41 PHEB 231500
TSUCAX

TSUNAMI MESSAGE NUMBER 3
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1500Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT PUERTO RICO AND THE VIRGIN ISLANDS. THE WEST COAST/ ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR THESE AREAS.

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

A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS -
MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE - CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA - HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA - TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE – 7.6
TIME – 1300 UTC MAR 23 2011
LOCATION – 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
DEPTH– 56 MILES/90 KM

MEASUREMENTS OR REPORTS OF TSUNAMI ACTIVITY

LOCATION	LAT	LON	TIME	AMPL
CHRISTIANSTED VI	17.7N	64.7W	1306Z	8.23 FT/2.51 M
LIMETREE BAY VI	17.6N	64.6W	1309Z	15.41 FT/4.70 M
LAMESHUR BAY VI	18.3N	64.7W	1318Z	9.37 FT/2.86 M
VIRGIN GORDA BVI	18.5N	64.5W	1319Z	4.59 FT/1.40 M
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MAGUEYES ISLAND PR	18.2N	67.2W	1351Z	2.48 FT/0.76 M
PUNTA CANA DR	18.5N	68.4W	1357Z	2.35 FT/0.72 M
SANTO DOMINGO DR	18.5N	69.9W	1359Z	1.97 FT/0.60 M
PUERTO PLATA DR	19.8N	70.7W	1402Z	1.68 FT/0.51 M
SAN JUAN PR	18.5N	66.1W	1405Z	1.94 FT/0.59 M
MAYAGUEZ PR	18.2N	67.1W	1408Z	0.66 FT/0.20 M
AGUADILLA PR	18.4N	67.1W	1427Z	4.82 FT/1.47 M
BASSETERRE SAINT KITTS	17.3N	62.7W	1425Z	4.41 FT/1.34 M
PLYMOUTH MONTSERRAT	16.7N	62.2W	1440Z	2.11 FT/0.64 M

TIME - TIME OF MEASUREMENT
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IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

REPORTS NOTE THE OIL SLICK FROM THE JERUSALEM AND FIGTREE HILL TANK FARM IN USVI TO BE SPREADING. THE TANK FARM HAS REPORTED 23 EMPLOYEES DEAD AND 8 MISSING. RUNUPS IN SAINT JOHN ANTIGUA ARE REPORTED TO EXCEED 2 METRES. SEVERAL PEOPLE ARE REPORTED MISSING THERE. THE WEST COAST OF BARBUDA REPORTS TSUNAMI RUNUPS NEAR 1.5 METRE. A NEAR 3 METRE RUNUP IN ROSEAU DOMINCA IS REPORTED TO HAVE SEVERLY FLOODED SECTIONS OF TOWN. RUNUPS MEASURING APPROXIMATELY 5 METRES ARE REPORTED IN SECTIONS OF GUADELOUPE WITH LARGE CURRENT AND FLOODING INDUCED DAMAGE. HARBORS IN MARTINIQUE HAVE EXPERIENCED STRONG SURGES WHICH HAVE PRODUCED DAMAGE TO MANY STRUCTURES AND BOATS. MINOR INUNDATION HAS BEEN REPORTED SANTO DOMINGO AND 23 PEOPLE WHO WERE CURIOUS ABOUT THE RECEDING TIDE AND WALKED OUT TO SEE THE STRANDED SEALIFE ARE REPORTED DEAD.

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

THE THREAT MAY CONTINUE FOR COASTAL AREAS LOCATED WITHIN ABOUT A THOUSAND KILOMETRES OF THE EARTHQUAKE EPICENTER. 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.

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

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES	ARRIVAL TIME
DOMINICA	ROSEAU	15.3N 61.4W	1404Z MAR23
SAINT MARTIN	BAIE BLANCH	18.1N 63.0W	1405Z MAR23
BARBUDA	PALMETTO POINT	17.6N 61.9W	1410Z MAR23
MARTINIQUE	FORT-DE-FRANCE	14.6N 61.1W	1411Z MAR23
SAINT LUCIA	CASTRIES	14.0N 61.0W	1412Z MAR23
DOMINICAN REP	PUERTO PLATA	19.8N 70.7W	1413Z MAR23
BONAIRE	ONIMA	12.3N 68.3W	1414Z MAR23
CURACAO	WILLEMSTAD	12.1N 68.9W	1418Z MAR23
TURKS N CAICOS	GRAND TURK	21.5N 71.1W	1418Z MAR23
ST VINCENT	KINGSTOWN	13.1N 61.2W	1419Z MAR23
ANTIGUA	SAINT JOHNS	17.1N 61.9W	1425Z MAR23
GRENADA	SAINT GEORGES	12.0N 61.8W	1428Z MAR23
HAITI	CAP-HAITEN	19.8N 72.2W	1430Z MAR23
ARUBA	ORANJESTAD	12.5N 70.0W	1433Z MAR23
TURKS N CAICOS	WEST CAICOS	21.7N 72.5W	1434Z MAR23
VENEZUELA	MAIQUETIA	10.6N 67.0W	1436Z MAR23
BAHAMAS	MAYAGUANA	22.3N 73.0W	1437Z MAR23
BARBADOS	BRIDGETOWN	13.1N 59.6W	1439Z MAR23
VENEZUELA	CUMANA	10.5N 64.2W	1442Z MAR23
BAHAMAS	GREAT INAGUA	20.9N 73.7W	1444Z MAR23
CUBA	BARACOA	20.4N 74.5W	1448Z MAR23
HAITI	JEREMIE	18.6N 74.1W	1450Z MAR23
TRINIDAD TOBAGO	PIRATES BAY	11.3N 60.6W	1451Z MAR23
BAHAMAS	SAN SALVADOR	24.1N 74.5W	1452Z MAR23
BAHAMAS	CROOKED IS	22.7N 74.1W	1455Z MAR23
CUBA	SANTIAGO D CUBA	19.9N 75.8W	1458Z MAR23
COLOMBIA	SANTA MARTA	11.2N 74.2W	1501Z MAR23
COLOMBIA	RIOHACHA	11.6N 72.9W	1501Z MAR23
COLOMBIA	BARRANQUILLA	11.1N 74.9W	1504Z MAR23
BAHAMAS	ELEUTHERA IS	25.2N 76.1W	1507Z MAR23
CUBA	GIBARA	21.1N 76.1W	1508Z MAR23
JAMAICA	MONTEGO BAY	18.5N 77.9E	1516Z MAR23
COLOMBIA	CARTEGENA	10.4N 75.6W	1516Z MAR23
BAHAMAS	NASSAU	25.1N 77.4W	1519Z MAR23

VENEZUELA	PUNTO FIJO	11.7N	70.2W	1521Z MAR23
JAMAICA	KINGSTON	17.9N	76.9W	1525Z MAR23
BAHAMAS	ABACO IS	26.6N	77.1W	1525Z MAR23
HAITI	PORT-AU-PRINCE	18.5N	72.4W	1527Z MAR23
VENEZUELA	PORLAMAR	10.9N	63.8W	1529Z MAR23
TRINIDAD TOBAGO	PORT-OF-SPAIN	10.6N	61.5W	1541Z MAR23
BAHAMAS	FREEPORT	26.5N	78.8W	1542Z MAR23
CUBA	CIENFUEGOS	22.0N	80.5W	1552Z MAR23
VENEZUELA	GOLFO VENEZUELA	11.4N	71.2W	1554Z MAR23
COLOMBIA	PUNTA CARIBANA	8.6N	76.9W	1600Z MAR23
CUBA	SANTA CRZ D SUR	20.7N	78.0W	1703Z MAR23
CUBA	LA HABANA	23.2N	82.4W	1703Z MAR23
CUBA	NUEVA GERONA	21.9N	82.8W	1806Z MAR23
GUYANA	GEORGETOWN	6.8N	58.2W	1812Z MAR23

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

WC/ATWC Message #6

WEXX20 PAAQ 231530
TSUAT1

BULLETIN
TEST...TSUNAMI MESSAGE NUMBER 6...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1130 AM AST WED MAR 23 2011

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES

LOCATION	LAT	LON	TIME	AMPL
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VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

A WITNESS REPORTED THAT FOUR PEOPLE WATCHING THE TIDE SUDDENLY RECEDE ON MAGUEYES ISLAND PR WERE SWEPTED OUT TO SEA WHEN THE SURGE OF WATER CAME BACK TOWARDS LAND. THE WITNESS WAS SAFELY WATCHING THE VICTIMS FROM A NEARBY HILL.

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COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1130 AM AST WED MAR 23 2011

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WC/ATWC Message #7

WEXX20 PAAQ 231601
TSUAT1

BULLETIN
TEST...TSUNAMI MESSAGE NUMBER 7...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1201 PM AST WED MAR 23 2011

THIS MESSAGE DOWNGRADES THE WARNING TO AN ADVISORY FOR PUERTO RICO AND THE VIRGIN ISLANDS.
...THIS MESSAGE IS FOR TEST PURPOSES ONLY...

... A TEST TSUNAMI ADVISORY IS NOW IN EFFECT FOR PUERTO RICO AND THE VIRGIN ISLANDS...

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

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES

LOCATION	LAT	LON	TIME	AMPL
SAN JUAN PR	18.5N	66.1W	1005 AST	1.94 FT/0.59 M
MAYAGUEZ PR	18.2N	67.1W	1008 AST	0.66 FT/0.20 M
AGUADILLA PR	18.4N	67.1W	1027 AST	4.82 FT/1.47 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

TSUNAMI HEIGHTS THROUGHOUT PUERTO RICO ARE DECREASING IN SIZE. 150 PEOPLE HAVE REPORTEDLY BEEN KILLED BY THE TSUNAMI IN PUERTO RICO... U.S. VIRGIN ISLANDS... AND BRITISH VIRGIN ISLANDS.

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE – 7.6
TIME – 0900 EDT MAR 23 2011
0900 AST MAR 23 2011
0800 CDT MAR 23 2011
1300 UTC MAR 23 2011
LOCATION – 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
DEPTH – 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231701-
/T.CAN.PAAQ.TS.W.0003.000000T0000Z-000000T0000Z/
/T.NEW.PAAQ.TS.Y.0003.110323T1601Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1201 PM AST WED MAR 23 2011

... A TEST TSUNAMI ADVISORY IS NOW IN EFFECT FOR PUERTO RICO AND THE VIRGIN ISLANDS...

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

TSUNAMI ADVISORIES MEAN THAT A TSUNAMI CAPABLE OF PRODUCING STRONG CURRENTS OR WAVES DANGEROUS TO PERSONS IN OR VERY NEAR

WATER IS IMMINENT OR EXPECTED. SIGNIFICANT WIDESPREAD INUNDATION IS NOT EXPECTED FOR AREAS IN AN ADVISORY. TSUNAMIS ARE A SERIES OF WAVES POTENTIALLY DANGEROUS SEVERAL HOURS AFTER INITIAL ARRIVAL TIME.

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

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PTWC Message #4

WECA41 PHEB 231601
TSUCAX

TSUNAMI MESSAGE NUMBER 4
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1601Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT PUERTO RICO AND THE VIRGIN ISLANDS. THE WEST COAST/ ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR THESE AREAS.

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

A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS - MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE - CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA - HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA - TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE – 7.6
TIME – 1300 UTC MAR 23 2011
LOCATION – 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
DEPTH – 56 MILES/90 KM

MEASUREMENTS OR REPORTS OF TSUNAMI ACTIVITY

LOCATION	LAT	LON	TIME	AMPL
SAN JUAN PR	18.5N	66.1W	1405Z	1.94 FT/0.59 M
MAYAGUEZ PR	18.2N	67.1W	1408Z	0.66 FT/0.20 M
AGUADILLA PR	18.4N	67.1W	1427Z	4.82 FT/1.47 M
PUNTA CANA DR	18.5N	68.4W	1357Z	2.35 FT/0.72 M

SANTO DOMINGO DR	18.5N	69.9W	1359Z 1.97 FT/0.60 M
PUERTO PLATA DR	19.8N	70.7W	1402Z 1.68 FT/0.51 M
BASSETERRE SAINT KITTS	17.3N	62.7W	1425Z 4.41 FT/1.34 M
PLYMOUTH MONTSERRAT	16.7N	62.2W	1440Z 2.11 FT/0.64 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

THE LARGE INUNDATION ALONG THE GUADELOUPE COAST HAS REPORTEDLY KILLED 75 PEOPLE. TSUNAMI RUNUP IN SAINT GEORGE GRENADA IS REPORTED TO BE NEAR 2 METRES. MINOR FLOODING OF THE WATERFRONT HAS BEEN REPORTED WITH LARGE AMOUNTS OF DAMAGE TO BOATS AND HARBOR FACILITIES. MUCH OF THE OIL SLICK NEAR LIMETREE BAY VI IS REPORTED TO BE ON FIRE. THIS FIRE HAS SPREAD SHOREWARD TO THE VEGETATION AND THE 25-KT SOUTHEAST WIND CONTINUES TO FAN IT INLAND. CHRISTIANSTED VI NOW REPORTS 120 DEAD AND AN ESTIMATED $63M USD IN DAMAGE. SAINT VINCENT REPORTS A WAVE APPROXIMATELY 1 METRE IN HEIGHT COMING INTO THE SHORE. THE SAINT VINCENT NATIONAL CONTACT REPORTS THE MOORINGS FROM TWO VESSELS BROKE DUE TO TENSION. THREE SAILORS DIED FROM THE RECOIL OF THE MOORING LINES. EXTENSIVE DAMAGE WAS REPORTEDLY DONE TO A CRUISE SHIP AT SAINT VINCENT WHEN A GANGWAY COLLAPSED AFTER THE SHIP WAS SUDDENLY LIFTED BY THE 1 METRE WAVE. THE SHIP'S GANGWAY COLLAPSED CAUSING THREE PASSENGERS TO FALL INTO THE WATER. ONE OF THE PASSENGERS IS REPORTED DEAD. STRONG CURRENTS ALONG SHORES OF CURACAO AND ARUBA HAVE BEEN REPORTED TO CAUSE DAMAGE TO SEVERAL SHIPS.

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

THE THREAT MAY CONTINUE FOR COASTAL AREAS LOCATED WITHIN ABOUT A THOUSAND KILOMETRES OF THE EARTHQUAKE EPICENTER. 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.

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

ESTIMATED INITIAL TSUNAMI ARRIVAL TIMES. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION		COORDINATES	ARRIVAL TIME
COLOMBIA	BARRANQUILLA	11.1N 74.9W	1504Z MAR23

BAHAMAS	ELEUTHERA IS	25.2N 76.1W	1507Z MAR23
CUBA	GIBARA	21.1N 76.1W	1508Z MAR23
JAMAICA	MONTEGO BAY	18.5N 77.9W	1516Z MAR23
COLOMBIA	CARTEGENA	10.4N 75.6W	1516Z MAR23
BAHAMAS	NASSAU	25.1N 77.4W	1519Z MAR23
VENEZUELA	PUNTO FIJO	11.7N 70.2W	1521Z MAR23
JAMAICA	KINGSTON	17.9N 76.9W	1525Z MAR23
BAHAMAS	ABACO IS	26.6N 77.1W	1525Z MAR23
HAITI	PORT-AU-PRINCE	18.5N 72.4W	1527Z MAR23
VENEZUELA	PORLAMAR	10.9N 63.8W	1529Z MAR23
TRINIDAD TOBAGO	PORT-OF-SPAIN	10.6N 61.5W	1541Z MAR23
BAHAMAS	FREEPORT	26.5N 78.8W	1542Z MAR23
CUBA	CIENFUEGOS	22.0N 80.5W	1552Z MAR23
VENEZUELA	GOLFO VENEZUELA	11.4N 71.2W	1554Z MAR23
COLOMBIA	PUNTA CARIBANA	8.6N 76.9W	1600Z MAR23
CUBA	SANTA CRZ D SUR	20.7N 78.0W	1703Z MAR23
CUBA	LA HABANA	23.2N 82.4W	1703Z MAR23
CUBA	NUEVA GERONA	21.9N 82.8W	1806Z MAR23
GUYANA	GEORGETOWN	6.8N 58.2W	1812Z MAR23

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

WC/ATWC Message #8

WEXX20 PAAQ 231630
TSUAT1

BULLETIN
TEST...TSUNAMI MESSAGE NUMBER 8...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
1230 PM AST WED MAR 23 2011

THIS MESSAGE CONTAINS NEW INFORMATION ON TSUNAMI OBSERVATIONS
AND CASUALTIES.

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...

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

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

RECOMMENDED ACTIONS
PERSONS IN LOW-LYING COASTAL AREAS SHOULD BE ALERT TO
INSTRUCTIONS FROM THEIR LOCAL EMERGENCY OFFICIALS. EVACUATIONS
ARE ONLY ORDERED BY EMERGENCY RESPONSE AGENCIES.

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

A TSUNAMI HAS BEEN OBSERVED AT THE FOLLOWING SITES

LOCATION	LAT	LON	TIME	AMPL
AGUADILLA PR	18.4N	67.1W	1027 AST	4.82 FT/1.47 M

TIME – TIME OF MEASUREMENT
AMPL – TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

TSUNAMI HEIGHTS THROUGHOUT PUERTO RICO CONTINUE TO DECREASE IN SIZE. 150 PEOPLE HAVE REPORTEDLY BEEN KILLED BY THE TSUNAMI IN PUERTO RICO... U.S. VIRGIN ISLANDS... AND BRITISH VIRGIN ISLANDS. ANOTHER 75 ARE REPORTED DROWNED IN GUADELOUPE.

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE – 7.6
TIME – 0900 EDT MAR 23 2011
0900 AST MAR 23 2011
0800 CDT MAR 23 2011
1300 UTC MAR 23 2011
LOCATION – 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
DEPTH– 56 MILES/90 KM

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

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

THIS MESSAGE IS BASED ON EARTHQUAKE DATA... OBSERVED TSUNAMI AMPLITUDES... HISTORICAL INFORMATION AND FORECAST MODELS.

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231730-
/T.CON.PAAQ.TS.A.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
1230 PM AST WED MAR 23 2011

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

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

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

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

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WC/ATWC Message #9

WEXX20 PAAQ 231701
WEXX20 PAAQ 231701
TSUAT1

BULLETIN
TEST...TSUNAMI MESSAGE NUMBER 9...TEST
NWS WEST COAST/ALASKA TSUNAMI WARNING CENTER PALMER AK
101 PM AST WED MAR 23 2011

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...

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

EVALUATION
DAMAGING TSUNAMIS ARE NO LONGER EXPECTED ALONG THE
COASTS PUERTO RICO AND THE VIRGIN ISLANDS.
AS LOCAL CONDITIONS CAN CAUSE A WIDE VARIATION IN TSUNAMI WAVE
ACTION THE ALL CLEAR DETERMINATIONS MUST BE MADE BY LOCAL AUTHORITIES.

TSUNAMI AMPLITUDES HAVE DROPPED BELOW DANGEROUS LEVELS AT MOST
LOCATIONS ALONG THE COASTS OF PUERTO RICO
AND THE VIRGIN ISLANDS. SEA LEVEL CONDITIONS STILL VARY GREATLY FROM
LOCATION TO LOCATION ALONG THE COAST. DECISIONS RELATING TO REOCCUPATION
OF COASTAL ZONES MUST BE MADE BY LOCAL AUTHORITIES.

WAVES THROUGHOUT THE PUERTO RICO AND THE VIRGIN ISLANDS ARE ALL
PRESENTLY
BELOW 0.5 METRES IN HEIGHT. THE DEATH TOLL HAS NOW CLIMBED TO 500 PEOPLE
TOTAL FOR PUERTO RICO... THE VIRGIN ISLANDS AND GUADELOUPE. DAMAGE TO
COASTAL STRUCTURES THROUGHOUT THESE ISLANDS IS EXTENSIVE... INCLUDING
RESORTS AND CRUISE SHIPS.

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE – 7.6
TIME– 0900 EDT MAR 23 2011
0900 AST MAR 23 2011
0800 CDT MAR 23 2011
1300 UTC MAR 23 2011
LOCATION – 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
60 MILES/97 KM SE OF SAN JUAN PUERTO RICO
DEPTH – 56 MILES/90 KM

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

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

AMZ712-715-725-735-742-745-PRZ001>003-005-007-008-010-011-
VIZ001-002-231901-
/T.CAN.PAAQ.TS.Y.0003.000000T0000Z-000000T0000Z/
COASTAL AREAS OF PUERTO RICO AND THE VIRGIN ISLANDS.
101 PM AST WED MAR 23 2011

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

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

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PTWC Message #5

WECA41 PHEB 231701
TSUCAX

TSUNAMI MESSAGE NUMBER 5
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1702Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT PUERTO RICO AND THE VIRGIN ISLANDS. THE WEST COAST/ ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR THESE AREAS.

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

A TSUNAMI WATCH IS IN EFFECT FOR
SAINT MAARTEN - ANGUILLA - SAINT KITTS -
MONTSERRAT - DOMINICAN REP - GUADELOUPE - DOMINICA - SAINT MARTIN - BARBUDA - MARTINIQUE - SAINT LUCIA - BONAIRE - CURACAO - TURKS N CAICOS - ST VINCENT - ANTIGUA - GRENADA -

HAITI - ARUBA - VENEZUELA - BAHAMAS - BARBADOS - CUBA -
TRINIDAD TOBAGO - COLOMBIA - JAMAICA AND GUYANA.

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

PRELIMINARY EARTHQUAKE PARAMETRES
MAGNITUDE – 7.6
TIME – 1300 UTC MAR 23 2011
LOCATION – 18.2 NORTH 65.3 WEST
25 MILES/40 KM SE OF FAJARDO PUERTO RICO
55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
DEPTH – 56 MILES/90 KM

MEASUREMENTS OR REPORTS OF TSUNAMI ACTIVITY

LOCATION	LAT	LON	TIME	AMPL
CHRISTIANSTED VI	17.7N	64.7W	1306Z	8.23 FT/2.51 M
LIMETREE BAY VI	17.6N	64.6W	1309Z	15.41 FT/4.70 M
LAMESHUR BAY VI	18.3N	64.7W	1318Z	9.37 FT/2.86 M
VIRGIN GORDA BVI	18.5N	64.5W	1319Z	4.59 FT/1.40 M
CULEBRA PR	18.3N	65.3W	1321Z	6.79 FT/2.07 M
CHARLOTTE AMALIE VI	18.4N	64.9W	1345Z	8.27 FT/2.52 M
MONA ISLAND PR	18.1N	67.9W	1348Z	0.85 FT/0.26 M
MAGUEYES ISLAND PR	18.2N	67.2W	1351Z	2.48 FT/0.76 M
SAN JUAN PR	18.5N	66.1W	1405Z	1.94 FT/0.59 M
MAYAGUEZ PR	18.2N	67.1W	1408Z	0.66 FT/0.20 M
AGUADILLA PR	18.4N	67.1W	1427Z	4.82 FT/1.47 M
PUNTA CANA DR	18.5N	68.4W	1357Z	2.35 FT/0.72 M
SANTO DOMINGO DR	18.5N	69.9W	1359Z	1.97 FT/0.60 M
PUERTO PLATA DR	19.8N	70.7W	1402Z	1.68 FT/0.51 M
BASSETERRE SAINT KITTS	17.3N	62.7W	425Z	4.41 FT/1.34 M
PLYMOUTH MONTSERRAT	16.7N	62.2W	1440Z	2.11 FT/0.64 M

TIME - TIME OF MEASUREMENT
AMPL - TSUNAMI AMPLITUDES ARE MEASURED RELATIVE TO NORMAL SEA LEVEL.
IT IS ...NOT... CREST-TO-TROUGH WAVE HEIGHT.
VALUES ARE GIVEN IN BOTH METRES(M) AND FEET(FT).

STRONG CURRENTS INDUCED BY APPROXIMATELY 1 METRE AMPLITUDE WAVES IN SAINT LUCIA REPORTED HAVE DESTROYED MOORINGS AND DOCKS IN THE REGION. BASSETERRE ST. KITTS REPORTS A 4+ FOOT WAVE THAT HAS INUNDATED ITS SHORELINE AS FAR INLAND AS CANYON STREET. A DOCKED FERRY WAS TORN FROM ITS MOORINGS IN BASSETERRE BAY AND WAS CARRIED INLAND TO THE BUS TERMINAL LOCATED NEAR THE DOCK. THE VANCE W. AMORY INTERNATIONAL AIRPORT AT PLYMOUTH MONTSERRAT REPORTS FLOODING ON THE RUNWAY AND HAS TEMPORARILY SHUTDOWN FLIGHT OPERATIONS.

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

THE THREAT MAY CONTINUE FOR COASTAL AREAS LOCATED WITHIN ABOUT A THOUSAND KILOMETRES OF THE EARTHQUAKE EPICENTER. 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.

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

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

PTWC Message #6

WECA41 PHEB 231802
TSUCAX

TSUNAMI MESSAGE NUMBER 6
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1802Z 23 MAR 2011

THIS MESSAGE IS FOR ALL AREAS OF THE CARIBBEAN EXCEPT PUERTO RICO AND THE VIRGIN ISLANDS. THE WEST COAST/ ALASKA TSUNAMI WARNING CENTER WILL ISSUE PRODUCTS FOR THESE AREAS.

... 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

PRELIMINARY EARTHQUAKE PARAMETRES

MAGNITUDE – 7.6	
TIME –	1300 UTC MAR 23 2011
LOCATION –	18.2 NORTH 65.3 WEST
	25 MILES/40 KM SE OF FAJARDO PUERTO RICO
	55 MILES/89 KM SE OF SAN JUAN PUERTO RICO
DEPTH –	56 MILES/90 KM

500 PEOPLE HAVE BEEN REPORTED DEAD DUE TO THIS EVENT AND NUMEROUS REPORTED MISSING. DAMAGE CAUSED BY THE FIRE IN LIMETREE BAY, VI AND THE TSUNAMI'S INUNDATION IN THE CARIBBEAN IS ESTIMATED TO BE MORE THAN $350M USD THUS FAR. THE FIRE AND OIL SLICK AT LIMETREE BAY VI HAS BEEN CONTAINED BUT INLAND FIRES WEST OF LIMETREE BAY CONTINUE TO BE FAUGHT. STRONG CURRENTS ARE ONGOING IN HARBORS THROUGHOUT THE EASTERN CARIBBEAN REGION.

SIGNIFICANT FLOODING HAS CEASED HOWEVER DANGER IN THE
WATER PERSISTS. FOOD AND PERSONNEL AID IS CURRENTLY BEING
FLOWN FROM NAVAL AIR STATION KEY WEST TO SEVERAL COMMUNITIES THROUGHOUT
THE CARIBBEAN.

EVALUATION
A DAMAGING TSUNAMI WAS OBSERVED IN THE NE CARIBBEAN SEA. MANY
REPORTS OF DAMAGE HAVE BEEN RECEIVED BY THE CENTER. SEA LEVEL
GAGES AND FORECAST MODELS INDICATE THAT THREAT LEVELS IN AFFECTED
REGIONS SHOULD NOW AT LOW LEVELS.

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

ANNEX IV

PRESS RELEASE

UNESCO Press Release

UNESCO Media Advisory No. 2011-10

Full-scale simulated tsunami alert in Caribbean

Paris, 17 March – Following the devastating tsunami that struck Japan, 33 countries* are preparing to participate on 23 March in the first full-scale simulated tsunami alert exercise in the Caribbean. The goal is to test the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, which was established in 2005 by the countries of the region in collaboration with UNESCO's Intergovernmental Oceanographic Commission (IOC).

According to the scenario developed by the organizers** of the exercise, countries in the Caribbean will receive an alert on 23 March concerning a fictitious earthquake of 7.6 magnitude off the coast of the American Virgin Islands. Bulletins will be issued by the West Coast/Alaska Tsunami Warning Center (United States) for Puerto Rico and the Virgin Islands, and by the Pacific Tsunami Warning Center (PTWC) in Ewa Beach (Hawaii, US) for the rest of the area.

The exercise, named Caribe Wave 11, does not involve communities. It aims to test the effectiveness of alert, monitoring and warning systems among all the emergency management organizations (national focal points for tsunami alerts, weather forecast offices, national coast guard, etc.) throughout the region. The test is designed to determine whether Caribbean countries are ready to respond in the event of a dangerous tsunami.

Previous experience underlines the crucial importance of rapid transmission of information. It has also shown that national authorities must take risk into account at all levels, including education about hazards in schools, urban planning in coastal zones, modification of building codes and materials, evacuation plans for communities and organization of effective emergency services.

"The earthquake and tsunami that have devastated Japan have shown how essential alert systems are," said UNESCO Director-General Irina Bokova. "In this context the development of a coordinated system in the Caribbean is more relevant than ever, enabling coastal countries to prepare in the event of such a disaster and to save human lives."

Over the last 500 years, 75 tsunamis have occurred in the Caribbean. This figure represents about 10% of the entire number of oceanic tsunamis in the world during that period. Tsunamis – caused by earthquakes or landslides, or of volcanic origin – have killed more that 3500 people in the region since the mid-19th century (source: National Oceanic and Atmospheric Administration, NOAA). In recent decades, an explosion in population growth and the number of tourists in coastal areas have further increased the region's vulnerability.

Simulated tsunami exercises have been organized previously in the Pacific in 2008 and in the Indian Ocean in 2009. The Intergovernmental Coordination Group of the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS) was established in 2005, replicating the model of the Pacific, Indian Ocean and Northeast Atlantic systems. Created under the banner of the IOC, the ICGs support Member States in implementing Tsunami Early Warning Systems.

****

*Aruba, Antigua and Barbuda, Bahamas, Barbados, Belize, Bolivarian Republic of Venezuela, Brazil, Canada, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, France (Martinique, Guadeloupe, St Martin, Guyane), Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands (Bonaire, Saba, Sint Eustatius, Curacao and Sint Marteen), Nicaragua, Panama, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sri Lanka, Suriname, Trinidad and Tobago, United Kingdom (Anguilla, British Virgin Islands, Bermuda, Cayman Islands, Montserrat, Turks and Caicos), United States.

**Intergovernmental Coordination Group for Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, the Caribbean Emergency Management Agency, the Centro de Coordinación para la Prevención de los Desastres Naturales en América Central, NOAA, and the U.S. National Tsunami Hazard Mitigation Program (NTHMP) are providing the framework for this exercise.

Contact: Agnès Bardon, UNESCO Division of Public Information
Tel :+33 (0) 1 45 68 17 64/a.bardon@unesco.org
More information: http://www.unesco.org/new/en/natural-sciences/ioc-oceans/high-level-objectives/marine-hazards/

NOAA Press Release

National Tsunami Awareness Week: March 20–26

Those Living Along U.S. Coastline Should Always Be Prepared for Tsunamis

21 March 2011

In the wake of Japan's tsunami disaster, NOAA is urging Americans who live and vacation at the coast to take the threat of tsunamis seriously. With more coastline than any other country in the world and proximity to several major fault lines, the Pacific, Atlantic, Gulf and Caribbean coasts of the United States are vulnerable to tsunamis. NOAA's National Weather Service, which operates the U.S. tsunami detection and warning system, says that the key to surviving a tsunami is staying informed and moving quickly to higher ground when a tsunami threatens.

In a message issued by the White House this week, President Barack Obama acknowledged that although the danger posed by tsunamis cannot be eliminated, NOAA's efforts within the National Tsunami Hazard Mitigation Program to work with local communities on hazard assessment, evacuation planning, and educational outreach can help save lives by equipping citizens to effectively respond to emergency situations.

The President also said the heartbreaking loss of life from the recent earthquake and tsunami in Japan reflects the catastrophic damage these unexpected disasters can cause.

"As we offer our assistance to those impacted by this tragedy, we also renew our commitment to ensuring preparedness along our shores," the President said. "Efficient warning systems and awareness in coastal communities are vital to protecting Americans in at-risk areas of the country."

This week should also serve as a crucial reminder for all Americans to take the time to get prepared now, before disaster strikes. Anyone can visit www.ready.gov to learn how.

Following the deadly 2004 Indian Ocean tsunami, Congress provided NOAA with more than $150 million to expand the nation's tsunami detection and warning capabilities, outreach and education and research, and provided support for a global tsunami warning and education network. As a result of this investment, the nation and world are better prepared for the next tsunami. For example, 83 U.S. coastal communities have earned the National Weather Service

TsunamiReady™ designation, up from only 11 in 2004. This program prepares emergency managers to warn citizens during a tsunami emergency.

The National Weather Service operates two tsunami warning centres, in Palmer, Alaska, and Ewa Beach, Hawaii. The centres, staffed 24/7, issue tsunami alerts (watches, warnings, advisories and information statements) as early as two minutes after an earthquake. Upon receipt of tsunami alerts, state and local emergency management agencies determine the appropriate response, including whether to clear the beaches, sound sirens or evacuate people.

Here are some of the tsunami preparedness activities happening this week:

- On March 23, the National Weather Service and many states, including the U.S. Commonwealth of Puerto Rico and the U.S. Virgin Islands will test and practice tsunami response plans. This will be the first Caribbean-wide tsunami exercises. These exercises – ranging from table top exercises to full-scale drills and beach-front evacuations – provide an opportunity for coastal emergency management organizations to test and update emergency response plans for tsunamis. They also provide coastal residents and businesses an opportunity to review and practice tsunami response plans.
- The National Weather Service will host open houses at its Tsunami Warning Centers in Alaska and Hawaii.
- Alaska will host a “quake cottage” in conjunction with the open house there to highlight earthquake and tsunami preparedness.
- Many coastal states will host community tsunami awareness activities.
- NOAA and the National Tsunami Hazard Mitigation Program will release a National Tsunami Media Guidebook and Puerto Rico will issue a media tool-kit for the Commonwealth.
- California will distribute outreach materials to coastal communities.
- Washington’s state-local tsunami workgroup will participate in a table top exercise to test current response and evacuation capabilities as well as short and long-term sheltering protocols.

<u>Warning Signs of a Tsunami:</u>

- A strong earthquake, or one that persists for 20 seconds or longer;
- The ocean withdraws or rises rapidly;
- A loud, roaring sound (like an airplane or a train) coming from the ocean;
- Tsunami warnings broadcast over television and radio, by beach lifeguards, community sirens, text message alerts, National Weather Service tsunami warning center Web sites and on NOAA Weather Radio All Hazards.

<u>What You Should Do if You See These Signs:</u>

- Keep calm.
- Immediately move to your local tsunami shelter using defined tsunami evacuation routes.
- If there are no evacuation routes defined, move to higher ground that is at least 100 feet in elevation, a mile inland, or to the highest floor of a sturdy building and STAY there.
- If you are already in a safe location, STAY there.

- Move on foot when possible - do not drive – keep roads clear for emergency vehicles.
- Stay tuned to NOAA Weather Radio or news broadcasts for changes in tsunami alerts.
- Stay away from the coast and low-lying areas until local officials say it’s safe to return.

NOAA's National Weather Service is the primary source of weather data, forecasts and warnings for the United States and its territories. NOAA’s National Weather Service operates the most advanced weather and flood warning and forecast system in the world, helping to protect lives and property and enhance the national economy.

ANNEX V

LIST OF ACRONYMS

AEMEAD	Emergency Management Agency and Disaster Administration in Puerto Rico
AFTN	Aeronautical Fixed Telecommunication Network
ATFM	Alaska Tsunami Forecast Model
AWIPS	Advanced Weather Interactive Processing System
CDEMA	Caribbean Emergency Management Agency
CEPREDENAC	Centro de Coordinación para la Prevención de los Desastres Naturales en América Central
COE	Emergency Operations Center
CTWP	Caribbean Tsunami Warning Program
EAS	Emergency Alert System
EMO	Emergency Management Organization
EMWIN	Emergency Managers Weather Information Network
EMWIN	Emergency Manager's Weather Information Network
EOC	Earth Observation Center
EOP	Emergency Operations Plan
FUNVISIS	Fundación Venezolana de Investigaciones Sismológicas
GTS	Global Telecommunications System
ICG	Intergovernmental Coordination Group
ICG/CARIBE EWS	Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions
INETER	Instituto Nicaragüense de Estudios Territoriales
IOC	Intergovernmental Oceanographic Commission
LANTEX	Intergovernmental Coordination Group
LZPR	Local Zone of Puerto Rico
NOAA	National Oceanic and Atmospheric Administration

NTHMP	U.S. National Tsunami Hazard Mitigation Program
NWWS	NOAA Weather Wire Service
PRSN	Puerto Rico Seismic Network of the University of Puerto Rico at Mayagüez
PTWC	Pacific Tsunami Warning Center
RIFT	Rapid Inundation and Forecasting of Tsunamis model
SOP	Standard Operational Procedures
TIB	Tsunami Information Bulletin
TWC	Tsunami Warning Center
TWFP	Tsunami Warning Forecast Points
UNESCO	United National Educational, Scientific, and Cultural Organization
USC	University of Southern California's
VTEC	Valid Time Event Codes
WC/ATWC	West Coast and Alaska Tsunami Warning Center
WFO	Weather Forecast Offices
WG	Working Group
WMO	World Meteorological Organization

No.	Title	Languages
1	Manual on International Oceanographic Data Exchange. 1965	(out of stock)
2	Intergovernmental Oceanographic Commission (Five years of work). 1966	(out of stock)
3	Radio Communication Requirements of Oceanography. 1967	(out of stock)
4	Manual on International Oceanographic Data Exchange - Second revised edition. 1967	(out of stock)
5	Legal Problems Associated with Ocean Data Acquisition Systems (ODAS). 1969	(out of stock)
6	Perspectives in Oceanography, 1968	(out of stock)
7	Comprehensive Outline of the Scope of the Long-term and Expanded Programme of Oceanic Exploration and Research. 1970	(out of stock)
8	IGOSS (Integrated Global Ocean Station System) - General Plan Implementation Programme for Phase I. 1971	(out of stock)
9	Manual on International Oceanographic Data Exchange - Third Revised Edition. 1973	(out of stock)
10	Bruun Memorial Lectures, 1971	E, F, S, R
11	Bruun Memorial Lectures, 1973	(out of stock)
12	Oceanographic Products and Methods of Analysis and Prediction. 1977	E only
13	International Decade of Ocean Exploration (IDOE), 1971-1980. 1974	(out of stock)
14	A Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment and Baseline Study Guidelines. 1976	E, F, S, R
15	Bruun Memorial Lectures, 1975 - Co-operative Study of the Kuroshio and Adjacent Regions. 1976	(out of stock)
16	Integrated Ocean Global Station System (IGOSS) General Plan and Implementation Programme 1977-1982. 1977	E, F, S, R
17	Oceanographic Components of the Global Atmospheric Research Programme (GARP) . 1977	(out of stock)
18	Global Ocean Pollution: An Overview. 1977	(out of stock)
19	Bruun Memorial Lectures - The Importance and Application of Satellite and Remotely Sensed Data to Oceanography. 1977	(out of stock)
20	A Focus for Ocean Research: The Intergovernmental Oceanographic Commission - History, Functions, Achievements. 1979	(out of stock)
21	Bruun Memorial Lectures, 1979: Marine Environment and Ocean Resources. 1986	E, F, S, R
22	Scientific Report of the Interealibration Exercise of the IOC-WMO-UNEP Pilot Project on Monitoring Background Levels of Selected Pollutants in Open Ocean Waters. 1982	(out of stock)
23	Operational Sea-Level Stations. 1983	E, F, S, R
24	Time-Series of Ocean Measurements. Vol.1. 1983	E, F, S, R
25	A Framework for the Implementation of the Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment. 1984	(out of stock)
26	The Determination of Polychlorinated Biphenyls in Open-ocean Waters. 1984	E only
27	Ocean Observing System Development Programme. 1984	E, F, S, R
28	Bruun Memorial Lectures, 1982: Ocean Science for the Year 2000. 1984	E, F, S, R
29	Catalogue of Tide Gauges in the Pacific. 1985	E only
30	Time-Series of Ocean Measurements. Vol. 2. 1984	E only
31	Time-Series of Ocean Measurements. Vol. 3. 1986	E only
32	Summary of Radiometric Ages from the Pacific. 1987	E only
33	Time-Series of Ocean Measurements. Vol. 4. 1988	E only

(continued)

No.	Title	Languages
34	Bruun Memorial Lectures, 1987: Recent Advances in Selected Areas of Ocean Sciences in the Regions of the Caribbean, Indian Ocean and the Western Pacific. 1988	Composite E, F, S
35	Global Sea-Level Observing System (GLOSS) Implementation Plan. 1990	E only
36	Bruun Memorial Lectures 1989: Impact of New Technology on Marine Scientific Research. 1991	Composite E, F, S
37	Tsunami Glossary - A Glossary of Terms and Acronyms Used in the Tsunami Literature. 1991	E only
38	The Oceans and Climate: A Guide to Present Needs. 1991	E only
39	Bruun Memorial Lectures, 1991: Modelling and Prediction in Marine Science. 1992	E only
40	Oceanic Interdecadal Climate Variability. 1992	E only
41	Marine Debris: Solid Waste Management Action for the Wider Caribbean. 1994	E only
42	Calculation of New Depth Equations for Expendable Bathymerographs Using a Temperature-Error-Free Method (Application to Sippican/TSK T-7, T-6 and T-4 XBTS. 1994	E only
43	IGOSS Plan and Implementation Programme 1996-2003. 1996	E, F, S, R
44	Design and Implementation of some Harmful Algal Monitoring Systems. 1996	E only
45	Use of Standards and Reference Materials in the Measurement of Chlorinated Hydrocarbon Residues. 1996	E only
46	Equatorial Segment of the Mid-Atlantic Ridge. 1996	E only
47	Peace in the Oceans: Ocean Governance and the Agenda for Peace; the Proceedings of *Pacem in Maribus* XXIII, Costa Rica, 1995. 1997	E only
48	Neotectonics and fluid flow through seafloor sediments in the Eastern Mediterranean and Black Seas - Parts I and II. 1997	E only
49	Global Temperature Salinity Profile Programme: Overview and Future. 1998	E only
50	Global Sea-Level Observing System (GLOSS) Implementation Plan-1997. 1997	E only
51	L'état actuel de 1'exploitation des pêcheries maritimes au Cameroun et leur gestion intégrée dans la sous-région du Golfe de Guinée *(cancelled)*	F only
52	Cold water carbonate mounds and sediment transport on the Northeast Atlantic Margin. 1998	E only
53	The Baltic Floating University: Training Through Research in the Baltic, Barents and White Seas - 1997. 1998	E only
54	Geological Processes on the Northeast Atlantic Margin (8^{th} training-through-research cruise, June-August 1998). 1999	E only
55	Bruun Memorial Lectures, 1999: Ocean Predictability. 2000	E only
56	Multidisciplinary Study of Geological Processes on the North East Atlantic and Western Mediterranean Margins (9^{th} training-through-research cruise, June-July 1999). 2000	E only
57	Ad hoc Benthic Indicator Group - Results of Initial Planning Meeting, Paris, France, 6-9 December 1999. 2000	E only
58	Bruun Memorial Lectures, 2001: Operational Oceanography – a perspective from the private sector. 2001	E only
59	Monitoring and Management Strategies for Harmful Algal Blooms in Coastal Waters. 2001	E only
60	Interdisciplinary Approaches to Geoscience on the North East Atlantic Margin and Mid-Atlantic Ridge (10^{th} training-through-research cruise, July-August 2000). 2001	E only
61	Forecasting Ocean Science? Pros and Cons, Potsdam Lecture, 1999. 2002	E only

No.	Title	Languages
62	Geological Processes in the Mediterranean and Black Seas and North East Atlantic (11th training-through-research cruise, July- September 2001). 2002	E only
63	Improved Global Bathymetry – Final Report of SCOR Working Group 107. 2002	E only
64	R. Revelle Memorial Lecture, 2006: Global Sea Levels, Past, Present and Future. 2007	E only
65	Bruun Memorial Lectures, 2003: Gas Hydrates – a potential source of energy from the oceans. 2003	E only
66	Bruun Memorial Lectures, 2003: Energy from the Sea: the potential and realities of Ocean Thermal Energy Conversion (OTEC). 2003	E only
67	Interdisciplinary Geoscience Research on the North East Atlantic Margin, Mediterranean Sea and Mid-Atlantic Ridge (12th training-through-research cruise, June-August 2002). 2003	E only
68	Interdisciplinary Studies of North Atlantic and Labrador Sea Margin Architecture and Sedimentary Processes (13th training-through-research cruise, July-September 2003). 2004	E only
69	Biodiversity and Distribution of the Megafauna / Biodiversité et distribution de la mégafaune. 2006 Vol.1 The polymetallic nodule ecosystem of the Eastern Equatorial Pacific Ocean / Ecosystème de nodules polymétalliques de l'océan Pacifique Est équatorial Vol.2 Annotated photographic Atlas of the echinoderms of the Clarion-Clipperton fracture zone / Atlas photographique annoté des échinodermes de la zone de fractures de Clarion et de Clipperton Vol.3 Options for the management and conservation of the biodiversity — The nodule ecosystem in the Clarion Clipperton fracture zone: scientific, legal and institutional aspects	E F
70	Interdisciplinary geoscience studies of the Gulf of Cadiz and Western Mediterranean Basin (14th training-through-research cruise, July-September 2004). 2006	E only
71	Indian Ocean Tsunami Warning and Mitigation System, IOTWS. Implementation Plan, 7–9 April 2009 (2nd Revision). 2009	E only
72	Deep-water Cold Seeps, Sedimentary Environments and Ecosystems of the Black and Tyrrhenian Seas and the Gulf of Cadiz (15th training-through-research cruise, June–August 2005). 2007	E only
73	Implementation Plan for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS), 2007–2011. 2007 *(electronic only)*	E only
74	Bruun Memorial Lectures, 2005: The Ecology and Oceanography of Harmful Algal Blooms – Multidisciplinary approaches to research and management. 2007	E only
75	National Ocean Policy. The Basic Texts from: Australia, Brazil, Canada, China, Colombia, Japan, Norway, Portugal, Russian Federation, United States of America. (Also Law of Sea Dossier 1). 2008	E only
76	Deep-water Depositional Systems and Cold Seeps of the Western Mediterranean, Gulf of Cadiz and Norwegian Continental margins (16th training-through-research cruise, May–July 2006). 2008	E only
77	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – 12 September 2007 Indian Ocean Tsunami Event. Post-Event Assessment of IOTWS Performance. 2008	E only
78	Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE EWS) – Implementation Plan 2008. 2008	E only

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No.	Title	Languages
79	Filling Gaps in Large Marine Ecosystem Nitrogen Loadings Forecast for 64 LMEs – GEF/LME global project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	E only
80	Models of the World's Large Marine Ecosystems. GEF/LME Global Project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	E only
81	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – Implementation Plan for Regional Tsunami Watch Providers (RTWP). 2008	E only
82	Exercise Pacific Wave 08 – A Pacific-wide Tsunami Warning and Communication Exercise, 28–30 October 2008. 2008	E only
83.	*Cancelled*	
84.	Global Open Oceans and Deep Seabed (GOODS) Bio-geographic Classification. 2009	E only
85.	Tsunami Glossary	E, F, S
86	Pacific Tsunami Warning System (PTWS) Implementation Plan *(under preparation)*	
87.	Operational Users Guide for the Pacific Tsunami Warning and Mitigation System (PTWS) – Second Edition. 2011	E only
88.	Exercise Indian Ocean Wave 2009 (IOWave09) – An Indian Ocean-wide Tsunami Warning and Communication Exercise – 14 October 2009. 2009	E only
89.	Ship-based Repeat Hydrography: A Strategy for a Sustained Global Programme. 2009	E only
90.	12 January 2010 Haiti Earthquake and Tsunami Event Post-Event Assessment of CARIBE EWS Performance. 2010	E only
91.	Compendium of Definitions and Terminology on Hazards, Disasters, Vulnerability and Risks in a coastal context	*Under preparation*
92.	27 February 2010 Chile Earthquake and Tsunami Event – Post-Event Assessment of PTWS Performance (Pacific Tsunami Warning System). 2010	E only
93.	Exercise CARIBE WAVE 11 / LANTEX 11—A Caribbean Tsunami Warning Exercise, 23 March 2011	
	Vol.1 Participant Handbook / Exercise CARIBE WAVE 11 —Exercice d'alerte au tsunami dans les Caraïbes, 23 mars 2011. Manuel du participant / Ejercicio Caribe Wave 11. Un ejercicio de alerta de tsunami en el Caribe, 23 de marzo de 2011. Manual del participante. 2010	E/F/S
	Vol.2 Report. 2011	E only
	Vol.2 Supplement: Media Reports. 2011	E/F/S
94.	Cold seeps, coral mounds and deep-water depositional systems of the Alboran Sea, Gulf of Cadiz and Norwegian continental margin (17th training-through-research cruise, June–July 2008)	*Under preparation*
95.	International Post-Tsunami Survey for the 25 October 2010 Mentawai, Indonesia Tsunami	*Under preparation*
96.	Pacific Tsunami Warning System (PTWS) 11 March 2011 Off Pacific coast of Tohoku, Japan, Earthquake and Tsunami Event. Post-Event Assessment of PTWS Performance	*Under preparation*
97.	Exercise PACIFIC WAVE 11: A Pacific-wide Tsunami Warning and Communication Exercise, 9–10 November 2011	
	Vol. 1 Exercise Manual. 2011	E only
98.	Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and connected seas. First Enlarged Communication Test Exercise (ECTE1). Exercise Manual and Evaluation Report. 2011	E only

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Technical Series

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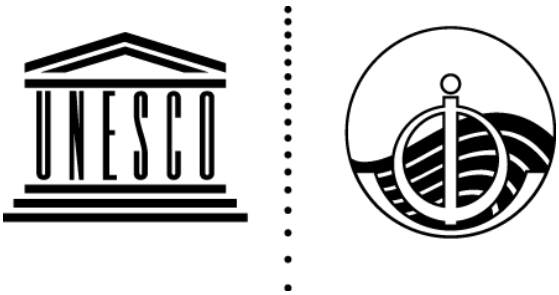

EXERCISE
CARIBE WAVE 11/ LANTEX11
A Caribbean Tsunami Warning Exercise

Volume 2 – Supplement

Media Reports

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EXERCISE
CARIBE WAVE 11/ LANTEX11
A Caribbean Tsunami Warning Exercise

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ANTIGUA AND BARBUDA

Exercise reveals Antigua & Barbuda's un-preparedness for tsunami

By Observer News - Saturday, March 26th, 2011.

Article Hits: 82

3 Comments

Director of the National Office of Disaster Service Philmore Mullin said the recently concluded regional tsunami simulation exercise Caribe Wave 11 has highlighted gaps in Antigua & Barbuda's preparedness for disasters.

Mullin concluded that key agencies needed to do a better job of notifying stakeholders.

The NODS director added that the test did not involve the public side where the media would have been called upon to assist with passing along the information to the public.

"We need to address that specifically where the public could be involved in something like that. One of the things that came out of the exercise is that we now know that the government departments do not know the number of persons amongst them that have children in schools that are in low lying areas or the impact zones," Mullin said.

"We now know that there is a significant amount of people that live on the coast in a low lying area, who, if a tsunami were to impact Antigua at the same time of the exercise, people would not be able to get access to their homes," Mullin added.

The test also revealed that other Caribbean territories such the USVI and Puerto Rico also have challenges.

When asked if Antigua & Barbuda is prepared to deal with an earthquake followed by a tsunami, Mullin said that unless effort is placed on sensitising and educating the public on what to do when a disaster strikes, then the efforts of the exercise would be in vain.

"You are going to have a certain amount of confusion and this is the point I want to make in response to your question but, 'Are we prepared to take the time and do the practice that is necessary as a nation for a long enough period for us to understand that when it happens what exactly it is we have to do to survive? Are we prepared to support the recommendations that are now on the table for our school system to do these drills and have these disaster management activities on a regular basis?" Mullin queried.

"Are we prepared to do these things in our workplace to ensure that when these things happen we do the right thing and stay safe? If we are prepared to do that, then my answer is yes, if we are not, then we are always going to have a deficit in our preparedness standards," he added.

The exercise was based on a fictional 7.6 magnitude earthquake located off the coast of the USVI.

It was the region's first-full scale tsunami warning exercise to test and strengthen the region's defences against such disasters.

The simulation was held off the coast of the US Virgin Islands on Wednesday.

http://www.antiguaobserver.com/?p=56314

BAHAMAS

Tsunami drill

Top of Form

select	377199659

Published On:Thursday, March 24, 2011

THE BAHAMAS was among 33 governments participating in a UN-organized tsunami drill yesterday, according to reports.

Although the drill had mixed results in some countries, emergency management workers in the Bahamas were reported to have successfully issued a text message alert to 300 officials across the country.

http://www.tribune242.com/news/03242011_TSUNAMI-DRILL

BARBADOS

Tsunami workshop exercise a success; early warning key to saving lives.

Posted on 24 March 2011 by Bajan Sun Online

Great Bay (DCOMM):— Section Head of Disaster Management Paul Martens described the workshop that brought together the 10-Emergency Support Functions (ESFs) of the Emergency Operations Center (EOC) to carry out a Caribbean-wide earthquake/tsunami exercise, as a success and will lead to the development of a national tsunami response plan for the country.

The exercise was based on a 7.6 magnitude earthquake near the U.S. Virgin Islands that triggered a 2.5 metre high tsunami.

Also attending the earthquake/tsunami scenario that took place in the conference room of the Fire & Ambulance Dept. in Cay Hill was Minister of Public Health, Social Development and Labour Cornelius de Weever and Emilia Thomas from the Cabinet of the Prime Minister. The EOC meeting was chaired by National Disaster Coordinator Fire Chief Winston Salomon.

The scenario was based on a 2.5 metre tsunami striking the airport and the village of Simpson Bay.

During the table top exercise, communicating the tsunami warning information to the Fire Department and Police quickly was key in order for them to be mobilized to direct traffic in order to prevent traffic jams and for the effective evacuation of the area to be impacted by a tsunami.

The ESFs were informed that a tsunami wave effect model is being created for the island with the assistance of UNESCO-IHE and the R3I project. The model is seen as a critical component that would benefit disaster prevention and preparedness.

Another essential point was that the island needs its own Meteorological Office that would issue the warning rather than depending on the Curacao Meteo Service.

Evacuation of residents along the coast and low lying areas inland was discussed extensively. Such an evacuation process would have to be done in an orderly manner and designated safe areas would have to be determined.

Early warning of coastal communities would be done via the disaster office sirens, emergency service vehicles, radio stations, SMS text messages, and email linked to blackberry services. The message would be multi-language, clear and instructive.

A public awareness tsunami campaign is the foundation for having the population prepared and also knowing exactly what action they would have to take once a tsunami warning has been issued by the authorities.

Other major points of discussion were the evacuation of the airport, how to deal with cruise ships in the harbour, the evacuation of hotels and schools. Further study is required with respect to the aforementioned, and the Ministry of Housing, Spatial Planning, Environment and Infrastructure (VROMI) and the Police are busy developing a new evacuation plan for certain areas of the island. A tsunami scenario will also be included in this plan.

Cooperation with the North side of the island was seen as essential during a disaster situation and a tsunami in particular.

The workshop was based on a United Nations Educational, Scientific, and Cultural Organizations (UNESCO) Intergovernmental Oceanographic Commission (IOC), earthquake/tsunami exercise.

The goal of the exercise was to test the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, which was established in 2005 by the countries of the region in collaboration with UNESCO and IOC.

The region-wide tsunami drill was referred to as “Exercise Caribe Wave 11/LANTEX.”

Over the last 500 years, 75 tsunamis have occurred in the Caribbean. This figure represents about 10 per cent of the entire number of oceanic tsunamis in the world during that period.

http://bajansunonline.com/tsunami-workshop-exercise-a-success-early-warning-key-to-saving-lives/

Tsunami exercise for region

Fri, March 18, 2011 – 11:31 AM

UNITED NATIONS – The United Nations says 33 countries will participate next week in the Caribbean region’s first full-scale tsunami warning exercise as part of its efforts to test and strengthen the region’s defences against such disasters.

The UN said next Wednesday’s exercise, code named “Caribe Wave 11” aims to test the early warning system for tsunamis and other coastal hazards set up in the region in 2005 by the Intergovernmental Oceanographic Commission (IOC), established under the UN Educational, Scientific and Cultural Organization (UNESCO).

The exercise will be based on a fictional earthquake measuring 7.6 on the Richter scale and located off the coast of the United States Virgin Islands, UNESCO said.

“It should highlight the effectiveness of tsunami warning mechanisms, weather forecast offices, national coast guards and other relevant offices,” the statement said.

Director-General of UNESCO, Irina Bokova, said last week’s catastrophic quake and tsunami in Japan “have clearly shown the crucial importance of emergency arrangements.

“The development of a coordinated system in the Caribbean appears in this context to be more pertinent than ever,” she added.

Similar exercises have taken place previously in both the Pacific and Indian Ocean regions.

In the Caribbean, at least 75 tsunamis have been recorded in the past 500 years, with more than 3,500 deaths attributed to them, the UN said. (CMC)

http://www.nationnews.com/index.php/articles/view/tsunami-exercise-for-region/

BOLIVARIAN REPUBLIC OF VENEZUELA

En Costas del estado Anzoátegui Funvisis finiquita detalles para el 1er Ejercicio de Simulacro de Tsunami denominado Caribe Wave 2011. Caracas, 22 de marzo de 2011

La Fundación Venezolana de Investigaciones Sismológicas (Funvisis), ente adscrito al Ministerio del Poder Popular para Ciencia, Tecnología e Industrias Intermedias (MCTI), finiquita últimos detalles para la realización del 1er ejercicio de Simulacro de Tsunami en las costas del estado Anzoátegui denominado “Caribe Wave 2011” a desarrollarse este miércoles 23 de marzo.

Funvisis viene trabajando en conjunto con la Gobernación, Protección Civil, Alcaldías y Zona Educativa de Anzoátegui, para la ejecución de este primer simulacro de Tsunami a efectuarse en diferentes comunidades de Puerto La Cruz, con el propósito de llevar a toda la población cuales son las medidas a emplear ante la ocurrencia de un evento adverso como lo son los terremotos, Tsunami y otras amenazas costeras.

El presidente de Funvisis Guy Vernáez, destacó que este primer ejercicio tiene la intención de realizar una evaluación de la respuesta de nuestras instituciones ante una alerta de Tsunami y preparar a las comunidades costeras para actuar ante eventos de esta naturaleza.

Con la finalidad de seguir impartiendo las medidas de prevención ante eventos adversos en todo el territorio venezolano, el Gobierno Bolivariano sigue difundiendo a través de Funvisis todas las medidas de autoprotección.

Lic. Yessica Higuera/Prensa Funvisis

http://www.funvisis.gob.ve/noticia.php?id=613

Simulacro preventivo de tsunami en Anzoátegui

09:25 pm – 22 Mar 2011

Un simulacro de tsunami realizará Protección Civil, este miércoles 23 de marzo, en el estado Anzoátegui, con el objetivo de mejorar la eficacia del sistema de alerta contra estos fenómenos.

Esta operación preventiva tiene el aval del Ministerio del Poder Popular para las Relaciones Interiores y Justicia bajo la coordinación, supervisión y cooperación de la Dirección Nacional de Protección Civil y Administración de Desastres y de la Fundación Venezolana de Investigaciones Sismológicas (Funvisis).

El ejercicio posibilitará que los organismos encargados de la gestión de emergencias y desastres pongan a prueba sus medios de comunicación operativos y examinen sus procedimientos de respuesta a los tsunami.

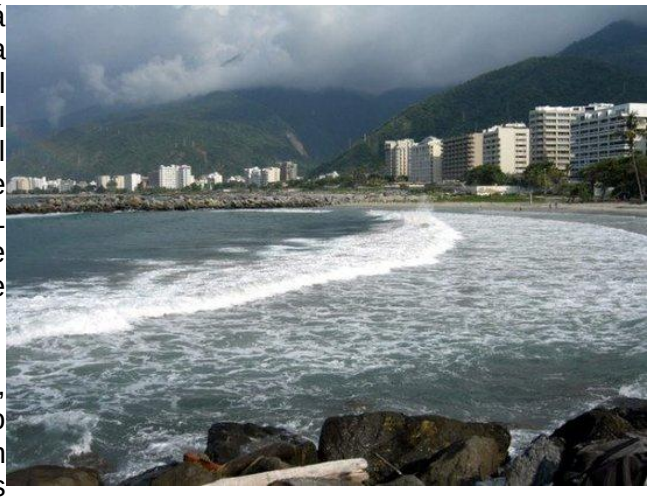
El simulacro se basa en un maremoto ficticio de 7,6 de intensidad que podría generar olas falsas de dos metros, dirigidas hacia las costas venezolanas.

Fuente: Patria Grande

http://www.patriagrande.com.ve/temas/venezuela/simulacro-preventivo-de-tsunami-en-anzoategui/

En coordinación con la Comisión Oceanográfica Internacional COI-UNESCO El Gobierno Bolivariano efectuará el 1er Ejercicio de Simulacro de Tsunami en Costas Venezolanas Caracas, 21 de marzo de 2011

El Gobierno Bolivariano, en ejercicio de su soberanía tecnológica, a través de la Fundación Venezolana de Investigaciones Sismológicas (Funvisis), ente adscrito al Ministerio del Poder Popular para Ciencia, Tecnología e Industrias Intermedias (MCTI), realizará el miércoles 23 de marzo de 2011, el 1er ejercicio de simulacro de Tsunami en las costas del estado Anzoátegui denominado “Caribe Wave 2011”.



Este Ejercicio de alerta de tsunami se desarrollará para ayudar a las iniciativas de preparación ante la eventualidad de un tsunami por toda la región del caribe. Los últimos eventos, como el tsunami del Océano Índico en 2004, el de Samoa en 2009, el Terremoto de Haití en 2010, el Terremoto de Tsunamigénico de Chile, y el último ocurrido el 11 de marzo en Japón, subrayan la importancia de que en Venezuela se disponga de una planificación que pueda responder ante un tsunami.

El presidente de Funvisis Lic. Guy Vernáez, acotó, que este trabajo se viene preparando desde el año pasado en coordinación con la Comisión Oceanográfica Internacional COI-UNESCO, además destacó la importancia de fomentar la cultura sísmica en América Latina. De la misma manera se pudo conocer que posiblemente el día de la realización del simulacro se cuente con la presencia de Observadores Internacionales.

Este simulacro se ejecutará no sólo en las costas venezolanas, sino que se estará llevando a cabo en las costas caribeñas tales como en Nicaragua, Puerto Rico, República Dominicana, Barbados, Costa Rica, entre otros, con el propósito de que las comunidades identifiquen las señales naturales ante un posible tsunami y para mejorar la eficiencia de los sistemas de alerta temprana ante este tipo de eventos adversos, apuntó el Lic. Vernáez.

Registros Históricos de Tsunamis en Venezuela

Evidencias históricas y estudios revelaron que en el año 1867, se originó un sismo de magnitud 7.5 en las Islas Vírgenes, ubicadas en el Mar Caribe y el Norte del Océano Atlántico, movimiento telúrico que ocasiono un Tsunami afectando las costas caribeñas entre ellas las costas venezolanas generando olas de aproximadamente 10 metros de altura en donde afecto la Isla de Margarita, todo el estado Sucre y el estado Anzoátegui.

Es por ello que el Gobierno Bolivariano a través de Funvisis y en conjunto con Protección Civil, Fundacite, Bomberos Policías, entre otros entes gubernamentales del estado Anzoátegui, tienen planificado la realización de un simulacro de Tsunami, con el mismo escenario del año 1867, para el 23 de marzo de 2011 denominado “CARIBE WAVE 2011”, en comunidades de los municipios, Bolívar, Sotillo, Guanta, Lic. Diego Bautista Urbaneja y el municipio San Juan Capistrano, en donde se han venido desarrollando actividades para la preparación comunitaria.

Una vez más el Gobierno Bolivariano a través de Funvisis demuestra su alta capacidad técnico-científica para el monitoreo y estudio de los eventos sísmicos en la región, con miras a la puesta en marcha del sistema de alerta de tsunami de la República Bolivariana de Venezuela.

Lic. Yessica Higuera / Prensa Funvisis

http://www.funvisis.gob.ve/noticia.php?id=612

En costas del Caribe y Regiones Adyacentes Gobierno Bolivariano y Asesor de la UNESCO realizaron encuentro en el marco de la implantación del Sistema de Alerta de Tsunami para las Costas Venezolanas Caracas, 14 de marzo de 2011

El Gobierno Bolivariano, en ejercicio de su soberanía tecnológica, a través de la Fundación Venezolana de Investigaciones Sismológicas (Funvisis), ente adscrito al Ministerio del Poder Popular para Ciencia, Tecnología e Industrias Intermedias (MCTI), establecieron una reunión el pasado mes de febrero de 2011, en las instalaciones de la fundación con un representante de la Comisión Oceanográfica Internacional COI-UNESCO y funcionarios de la Dirección de Hidrografía y Navegación (DHN), en el marco del proyecto Sistema de Alerta de Tsunami de la República Bolivariana de Venezuela.

Con la finalidad de hacer un intercambio de información técnica para implantar el sistema de alerta de Tsunami, el Dr. Masahiro Yamamoto Asesor de la COI-UNESCO, Visitó Venezuela, siendo recibido por especialistas de Funvisis. En dicha reunión se mostraron los avances en materia de soberanía tecnológica de la Red Sismológica Nacional, la conexión que tiene la red con el Satélite Simón Bolívar (Venesat-1) para la transmisión de datos, así como los instrumentos de medición que se emplean para el procesamiento y análisis de los datos sísmicos. De la misma manera hicieron mención a los programas que se utilizan en la Telemétrica de Funvisis, para obtener las señales digitales al igual que el intercambio de información técnica que se están haciendo a nivel internacional para la red mundial, con fines de participar y poder implementar el proyecto de alerta de tsunami y otras amenazas costeras en el país. También mostraron el resumen de los modelos numéricos y las actividades adelantadas en las reuniones internacionales de la COI-UNESCO, para el simulacro de tsunami denominado “CARIBE WAVE 2011” en Venezuela.

Además, el representante de la COI-UNESCO, realizó una presentación de un video en el Océano Indico que muestra los efectos y daños del Tsunami, que se originó tras el terremoto de Sumatra, y ratificó la importancia que tienen el intercambio de datos oceanográficos, sismológicos y meteorológicos para implementar un centro de alertas, al igual que recalcó los materiales que se deben emplear y tener mapas de amenazas costeras, los puntos focales, las comunicaciones que tienen que existir en un Centro de Alerta de Tsunami entre otros aspectos.

En tal sentido, el Dr. Masahiro Yamamoto, después de visitar las instalaciones de Funvisis, acotó que la fundación cuenta con los equipos necesarios para dar respuesta inmediata en el menor tiempo posible a la población a la hora de un terremoto y felicitó la capacidad de respuesta que tienen los analistas en cuanto al procesamiento y emisión del reporte sismológico.

Por otra parte, David Querales, representante de la DHN, mostró el sistema de monitoreo oceanográfico de la región marítima de Venezuela, el cual busca actualizar información meteorológica mediante la implementación de monitoreos de estaciones costera e insulares en aguas someras y profundas. Con el objetivo de que Funvisis y la DHN trabajen en conjunto para implementar un Centro de Alerta Temprana de Tsunami en Venezuela.

Simulacro de Tsunami en Costas Venezolanas

La quinta reunión del Grupo Intergubernamental de Coordinación del Sistema de Alerta contra los Tsunamis y otras Amenazas Costeras en el Caribe y Regiones Adyacentes (ICG/CARIBE EWS-V), que se celebró en Managua (Nicaragua) del 15 al 17 de marzo del 2010, decidieron efectuar un ejercicio conjunto de CARIBE WAVE 2011 y LANTEX 2011, para el Atlántico Occidental, el Caribe y sus Regiones Adyacentes el 23 de marzo de 2011.

Este Ejercicio de alerta de tsunami se desarrollará para ayudar a las iniciativas de preparación ante la eventualidad de un tsunami por toda la región del caribe. Los últimos eventos, como el tsunami del Océano Índico en 2004, el de Samoa en 2009, el Terremoto de Haití en 2010 y el Terremoto de Tsunamigénico de Chile, subrayan la importancia de que en Venezuela se disponga de una planificación que pueda responder ante un tsunami.

Evidencias históricas y estudios revelaron que en el año 1867, se originó un sismo de magnitud 7.5 en las Islas Vírgenes, ubicadas en el Mar Caribe y el Norte del Océano Atlántico, movimiento telúrico que ocasiono un Tsunami afectando las costas caribeñas entre ellas las costas venezolanas generando olas de aproximadamente 10 metros de altura en donde afecto la Isla de Margarita, todo el estado Sucre y el estado Anzoátegui.

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Una vez más el Gobierno Bolivariano a través de Funvisis demuestra su alta capacidad técnico-científica para el monitoreo y estudio de los eventos sísmicos en la región, con miras a la puesta en marcha del sistema de alerta de tsunami de la República Bolivariana de Venezuela.

Lic. Yessica Higuera / Prensa Funvisis

Foto: Rafael Rosario

http://www.funvisis.gob.ve/noticia.php?id=611

Funvisis realizará simulacro de tsunami en costas venezolanas y caribeñas Caracas, 14 de marzo de 2011

Un simulacro de tsunami se realizará próximamente en las costas venezolanas, informó el director de la Fundación Venezolana de Investigaciones Sismológicas (Funvisis), Guy Vernáez, este lunes, en entrevista concedida a Telesur.

Vernáez explicó que la actividad viene preparándose desde finales de 2010 y destacó la importancia de fomentar la cultura sísmica en América Latina.

El simulacro se ejecutará no sólo en las costas venezolanas, sino en el área caribeña, con el propósito de que las comunidades identifiquen las señales naturales ante un posible tsunami y para mejorar la eficiencia de los sistemas de alerta temprana ante este tipo de fenómenos.

Señaló que en lo que a cultura de prevención de desastres naturales se refiere, en el país se ha avanzado considerablemente.

Explicó que la prevención viene acompañada por la difusión informativa y la investigación, razón por la que durante los últimos 13 años en Venezuela se ha profundizado el trabajo relacionado con el fomento de la cultura sísmica en la población.

Refirió que Venezuela tiene una tradición en la materia, sobre todo a partir de 1967, cuando el 29 de julio ocurrió un terremoto que tuvo como epicentro el litoral central, estado Vargas, a 20 km de Caracas, el cual afectó mayormente a las zonas de Altamira y Los Palos Grandes, al este de la ciudad capital.

Resaltó que actualmente el país cuenta con tecnología avanzada en la materia y ha conformado una red sismológica.

“Si bien todavía falta mucho trabajo por hacer, el Gobierno Nacional viene trabajando en la disminución de la vulnerabilidad en algunas zonas, sobre todo con su nueva política de construcción de viviendas, para lo cual cuenta con el asesoramiento de técnicos de Funvisis, para determinar las condiciones de los terrenos no sólo para enfrentar terremotos, sino otra clase de eventos naturales, como deslizamientos”, añadió.

Prensa AVN / Prensa Funvisis

http://www.funvisis.gob.ve/noticia.php?id=610

COLOMBIA

Colombia participa este miércoles en simulacro de Tsunami con otros 32 países

Marzo 22, 2011 9:14 am

33 países del Caribe, entre ellos Colombia, participarán mañana, miércoles, en un simulacro a escala real contra los tsunamis, con el objetivo de probar la eficacia del sistema de alerta temprana contra esta amenaza tras el desastre que azotó hace más de una semana a Japón.

Sin embargo, este ejercicio, denominado ‘Caribe Wave 11′, no implica una movilización de las poblaciones de la región.

Su objetivo se limita a probar la eficacia de los dispositivos de alarma, vigilancia y aviso de todos los organismos de la región encargados de la gestión de situaciones de emergencia.

La jornada es promovida por el Sistema de Alerta Temprana contra los Tsunamis y otras Amenazas Costeras en el Caribe y Regiones Adyacentes, que fue creado en 2005, bajo los auspicios de la Comisión Oceanográfica Intergubernamental (COI) de la Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (Unesco).

Se trata, en definitiva, “de comprobar si todos los países ribereños del Caribe están listos para afrontar un tsunami eventualmente peligroso”.

La puesta a punto de un sistema coordinado en la región del Caribe es más pertinente que nunca para facilitar la preparación de los países ribereños de este mar contra la eventualidad de una catástrofe semejante”, afirmó la directora general de la Unesco, Irina Bokova.

“El terremoto y el tsunami que acaban de azotar a Japón con las trágicas consecuencias que todos sabemos han mostrado la importancia fundamental que tienen los dispositivos de alerta, indico la Unesco.

En los últimos cinco siglos, el Caribe ha sido azotado por 75 tsunamis, lo que representa un 10% del total mundial de los fenómenos de este tipo observados en ese periodo.

Países Bajos (Bonaire, Curazao, Saba, San Eustaquio y San Martín); Panamá; Perú; República Dominicana; Reino Unido (Anguila, Bermudas, Islas Caimán, Islas Turcos y Caicos, Islas Vírgenes Británicas y Montserrat); Saint Kitts y Nevis; San Vicente y las Granadinas; Santa Lucía; Sri Lanka; Suriname; Trinidad y Tobago, y la República Bolivariana de Venezuela.

Según la Unesco, en desarrollo del simulacro, los países del litoral del Caribe recibirán un aviso de alerta contra un presunto terremoto de magnitud 7,6, con epicentro frente a las costas de las Islas Vírgenes estadounidenses.

Los boletines de alerta para Puerto Rico y las Islas Vírgenes serán emitidos desde el Centro de Alerta contra los Tsunamis de la Costa Oeste y Alaska (Estados Unidos) y, para el resto de la región del Caribe, desde el Centro de Alerta contra los Tsunamis en el Pacífico, situado en Ewa Beach (Hawai-Estados Unidos).

Provocados por terremotos y desprendimientos de terrenos o por la actividad volcánica, los tsunamis han causado la muerte de más de 3.500 personas en la región caribeña desde mediados del siglo XIX, según datos facilitados por la Administración Nacional Oceánica y Atmosférica de los Estados Unidos.

Escrito por Ariel Cabrera | Clasificada bajo Nacional, Tema del Día

http://www.radiosantafe.com/2011/03/22/colombia-participa-este-miercoles-en-simulacro-de-tsunami-con-otros-32-paises/

DOMINICAN REPUBLIC

Simulacro de Tsunami en República Dominicana. El ejercicio se hará en todo el Caribe

La Oficina Nacional de Meteorología informó que hoy hará un simulacro de tsunami.

El ejercicio se realizará en todos los países del Caribe, dice una nota de prensa de la dependencia oficial.

Explica que el simulacro de tsunami será un "ejercicio de escritorio" y que no se va a desalojar a ningún ciudadano del lugar donde reside.

El operativo, denominado "Ejercicio Wave II", tiene el objetivo, según la directora de la ONAMET, Gloria Ceballos, de determinar la capacidad de repuesta de los organismos de socorro, aunque el personal no se movilizará, sino que sólo manejará informaciones.

De acuerdo a la funcionaria, el simulacro no está motivado por el terremoto y posterior tsunami que afectó a Japón el 11 de marzo pasado, sino que estaba programado desde el mes de octubre del 2010.

Con la evaluación, explicó, podrán determinarse los aspectos que requieren mejorar los organismos de socorro, en cuanto a su capacidad de respuesta ante tal fenómeno. El evento se llevará a cabo en coordinación con otras instituciones de respuesta ante desastres naturales.

http://www.cibaoenlinea.com/simulacro-de-tsunami-en-republica-dominicana/

Government agencies stage tsunami drill tomorrow

Santo Domingo – A to drill in response to a tsunami alert will be staged tomorrow Wednesday by the National Meteorology Institute (ONAMET), whose director asks the population not to be alarmed by the exercise to evaluate the readiness capacity of the agencies involved.

Gloria Ceballos unveiled the drill called "Caribbean Wave Exercise II" and affirmed explained that it was scheduled since last October and will be based on the memory of the tidal wave which slammed the Virgin Islands in 1877, which makes it the Caribbean region's most recent.

The official said among objectives of the tsunami drill, based on a 7.6 magnitude quake, is to observe how the government agencies coordinate their effort during an event of that nature. "It will evaluate what we must improve to provide a response, but we're not going to mobilize people nor boats, is an exchange of information instead."

http://www.dominicantoday.com/dr/local/2011/3/22/38992/Government-agencies-stage-tsunami-drill-tomorrow

3.24.2011

Republica Dominicana: falta plan de emergencia ante tsunamis

El simulacro de alerta de tsunami realizado el miércoles evidenció que República Dominicana carece de un plan de evacuación y respuesta inmediata ante ese tipo de fenómenos, advirtió el Centro de Operaciones de Emergencia (COE).

"Tenemos que abocarnos a diseñar un plan, que no lo tenemos, y a educar la población", dijo a la AP elRecordó que, aunque el país creó en 2009 un plan de emergencia ante terremotos, no lo ha hecho para enfrentar tsunamis.

El ejercicio Caribe Wave 11, organizado por la Unesco, simuló la información de un sismo de 7,6 grados, similar al ocurrido en 1918 al sur de las Islas Vírgenes Estadounidenses y que podría generar una ola en toda la región de las Antillas.

Los técnicos que participaron en la mesa de crisis del COE determinaron, con base en un mareógrafo instalado en Punta Cana, que con esas características del sismo la ola alcanzaría 1,3 metros de altura y podría generar daños hasta a un kilómetro adentro de la línea costera en la región este y sur del país.Méndez recordó que mientras la costa este concentra la mayor parte de hoteles de la industria turística, que en total recibe 4 millones de viajeros al año, en el sur se encuentran los principales depósitos de hidrocarburos, como la Refinería Dominicana de Petróleos y el puerto multidomodal Caucedo.

El ministerio de turismo y los hoteles deberán a partir de la experiencia surgida del simulacro comenzar a diseñar un plan de evacuación y de prevención, así como a evaluar sus instalaciones, adelantó Méndez.

El director del COE precisó que los miembros de la mesa de crisis también establecieron comunicación con los responsables de los depósitos de hidrocarburos y del geseoducto de Azua, a unos 125 kilómetros al sur, para comenzar a establecer un plan de contingencia.

El Centro, que agrupa a unas 30 organizaciones de seguridad, salud y socorro, también comenzará a evaluar las edificaciones que podrían ser dañadas ante la eventualidad de un tsunami a fin de establecer medidas de prevención.

"Pero de nada nos sirve contar con planes de contingencia en los organismos de emergencia, si la población no sabe qué hacer", comentó el oficial

Explicó que la mayor parte de los 9,3 millones de dominicanos nunca han visto un tsunami, por lo que el COE comenzará a diseñar un plan de autoevacuación y una campaña nacional.

La última vez que un tsunami se registró en República Dominicana fue en 1946, cuando una ola destruyó varios poblados en la provincia María Trinidad Sánchez, 190 kilómetros al noreste de la capital, y provocó unas 500 muertes, según los reportes de la época.

La Oficina Nacional de Meteorología recordó que los sensores que ha instalado en el mar emiten alertas ante tsunami que ofrecen unos 25 minutos para realizar las evacuaciones.

http://higueyonline.blogspot.com/2011/03/republica-dominicana-falta-plan-de.html

FRENCH WEST INDIES

MARTINIQUE

Les autorités se préparent

J.-M.A. France-Antilles Martinique 24.03.2011

Le premier groupe de travail devait s'efforcer de rédiger les procédés opérationnels pour chaque service.

Un exercice d'alerte au tsunami, prévu de longue date et baptisé Caribe Wave, s'est déroulé hier en préfecture.

Exercice Tsunami. Trente-trois pays dont la France (Martinique, Guadeloupe, Saint-Martin, Guyane) ont participé hier à un exercice d'alerte au tsunami dans la Caraïbe, baptisé Caribe Wave, et prévu de longue date, mais qui tombe à pic, afin de tester le système d'alerte rapide aux tsunamis pour la mer des Caraïbes et des régions adjacentes. Un système mis en place en 2005 sous l'égide de la commission océanographique intergouvernementale (COI) de l'Unesco.

Selon le scénario établi par les organisateurs, les pays riverains de la mer des Caraïbes ont reçu hier à 9 heures une alerte concernant un tremblement de terre fictif de magnitude 7,6 situé au large des côtes des îles Vierges américaines (fait qui avait réellement eu lieu le 18 novembre 1867).

L'alerte a été diffusée par le centre d'alerte des tsunamis dans le Pacifique (PTWC) d'Ewa Beach (Hawaï). Pour mener à bien l'exercice, deux groupes de travail ont été constitués en préfecture. Objectif : tester l'alerte montante (du PTWC vers les responsables de la gestion de crise) ; définir les procédures de diffusion de l'alerte descendante vers la population.

« En vingt minutes, c'est déjà plus compliqué »

Le premier groupe, composé du centre régional opérationnel de surveillance et de sauvetage Antilles-Guyane (Crossag), de la police, du service de protection civile de la préfecture, de la gendarmerie, du Samu, du conseil régional, du conseil général, de Météo France, du rectorat, et de l'agence régionale de santé (ARS), devait s'efforcer de rédiger les procédés opérationnels pour chaque service. Le second groupe de travail devait organiser avec les médias la transmission rapide de l'alerte auprès de la population.

« Les deux groupes planchaient sur deux cas : un tsunami qui arrive en moins de 20 minutes sur les côtes et un tsunami qui arrive au bout de cinq à six heures » , explique Philippe Cova, chef de l'État-major de la zone de défense Antilles. « Aujourd'hui, en six heures, on sait comment prévenir la population. En revanche, en vingt minutes, c'est déjà plus compliqué » .

À noter que l'exercice n'a pas impliqué les populations. Et pour cause : « La Martinique devait être impactée par une vague de 25 cm et la Guadeloupe par une vague de 20 cm » , souligne Philippe Cova. « En gestion opérationnelle, il a donc été décidé de ne pas associer les populations, aucune évacuation n'étant prévue dans le scénario international » .

Il n'en reste pas moins qu'il faudra former la population afin qu'elle sache quelle attitude adopter en cas de risque de tsunami.

- Exercice d'évacuation dans un collège

Hier, le rectorat a été associé à l'exercice dans la perspective d'une intégration de l'Éducation nationale dans la chaîne d'alerte. Un exercice d'évacuation a eu lieu dans un collège de 400 élèves du Robert. Bilan : entre le déclenchement de l'évacuation par l'établissement scolaire et l'arrivée des collégiens en zone sécurisée, vingt minutes (un peu moins même) se sont écoulées. Ce collège, dans le cadre de son plan particulier de mise en sûreté (PPMS) en cas de tsunami, avait justement identifié un seul lieu de mise en sûreté. Par ailleurs, cet établissement du Robert prévoit systématiquement dans son organisation, s'agissant du risque sismique, l'intégration du volet tsunami.

- Des scientiques en Guadeloupe

La 19e conférence géologique de la Caraïbe planche notamment sur les risques sismiques et marins dans la Caraïbe.

Hasard du calendrier, la conférence géologique de la Caraïbe, programmée depuis des mois, se tient jusqu'à jeudi, au Salako (Le Gosier). Et l'une des principales thématiques abordées concerne les tsunamis et vagues océaniques.

La Caraïbe – et singulièrement, les Antilles françaises – n'a pas attendu le tsunami au Japon, ni même celui d'Asie (décembre 2004), pour plancher sur ce phénomène. Depuis bien des années, des chercheurs de l'Université des Antilles et de la Guyane, ainsi que des scientifiques des observatoires volcanologiques et sismologiques, travaillent sur le sujet. À leur crédit, une kyrielle de travaux d'envergure, parmi lesquels un historique des tsunamis aux Antilles, un système de modélisation d'éventuelles attaques de tsunamis pour le bassin caribéen et, bien évidemment, une participation majeure au système d'alerte au tsunami, en cours de réalisation, qui devrait être opérationnel d'ici à 3 ans et couvrira l'ensemble de la Caraïbe.

Projet essentiel : quelque 40 millions de personnes vivent dans les zones côtières du bassin caribéen, et il faut y ajouter 70 millions de touristes qui, chaque année, fréquentent ces mêmes zones.

- Gare aux volcans

Les Antilles peuvent être victimes d'autres types de tsunamis que ceux - très importants ici - liés à l'activité sismique. Ces autres risques sont notamment liés à des volcans, via une explosion, ou un effondrement. On connaît le volcan de Montserrat, Soufrière Hills : les effondrements de son dôme ont déjà provoqué de petits tsunamis sur Deshaies et sa région. On connaît moins le Kick-'em-Jenny, un volcan sous-marin qui se trouve à huit kilomètres de l'île de Grenade : une éruption importante pourrait provoquer un tsunami dans la région.

Enfin, il ne faut pas oublier les télétsunamis, capables de traverser l'océan. L'ensemble de la Caraïbe pourrait ainsi être frappé par un de ces télétsunamis si le flanc - très instable - du Cumbre Vieja, un volcan des Canaries, s'effondrait brutalement dans l'océan. Enfin, de récentes études scientifiques (source Unesco) évoquent des risques liés à un mouvement des plaques tectoniques de l'Amérique du Nord et des Caraïbes, ainsi qu'à des glissements de terrain sous-marins importants au niveau de la côte nord de Porto Rico.

http://www.martinique.franceantilles.fr/actualite/une/les-autorites-se-preparent-24-03-2011-106294.php

GUADELOUPE

Alerte tsunami : la Guadeloupe peut mieux faire

La Guadeloupe a participé hier à un exercice grandeur nature d'alerte tsunami. Bilan : il a fallu 27 minutes entre la détection du tsunami et l'alerte diffusée sur les médias.

[jeudi 24 mars 2011 à 00:13:00 | DOMactu.com | Par Julien Mercier]

Cet exercice a été initié par le groupe intergouvernemental de coordination du système d'alerte tsunami et autres risques côtiers dans la mer des caraïbes, et les régions adjacentes dépendant de la commission océanographique de l'UNESCO.

Au total, 33 pays de la zone y ont participé; un exercice qui n'impliquait pas, cette fois, les populations.

En revanche l'ensemble des services de secours, de coordination et de détection météo ainsi que le SDIS, la police, la gendarmerie et trois médias locaux étaient conviés à y participer.

Cet exercice consistait à tester la réactivité face à un tsunami. Les pays riverains de la mer des caraïbes ont reçu une alerte concernant un tremblement de terre de magnitude 7,6 situé au large des côtes des Iles Vierges Américaines. Le message a été diffusé par le centre d'alerte tsunami du Pacifique situé à Hawaii.

L'objectif était de calculer le délai d'alerte entre l'apparition du tsunami et le moment où l'alerte parvient aux media locaux, ce que l'on appelle en terme technique le cheminement.

"27 minutes" : c'est le temps qui s'est écoulé entre l'alerte et sa réception par les médias; un délai compris entre 20 et 25 minutes serait l'idéal.

Cela dit, un séisme fort et long doit être le premier indicateur pour les populations qui doivent alors quitter les côtes pour se réfugier dans un lieu situé à 10 mètres au dessus du niveau de la mer.

En conclusion, un séisme dont l'épicentre se situera au-delà de 200 kilomètres, donne le temps de déclencher une alerte.

L'estimation du délai d'alerte est un élément clé pour finaliser le plan de secours tsunami et elle conditionnera les méthodes d'alerte à l'avenir…

Julien Mercier - DOMactu.com

http://www.domactu.com/actualite/132313460296871/guadeloupe-alerte-tsunamis-la-guadeloupe-peut-mieux-faire/

GUATEMALA

Guatemala, 23 marzo (Noticias de Bomberos en Guatemala) – Un total de 33 países del Caribe participan hoy en un simulacro técnico de Tsunami a escala real denominado "Caribe Wave 11", cuyo objetivo es probar la eficacia del sistema de alerta temprana contra esta amenaza tras el desastre que azotó hace más de una semana a Japón.

Imagen del Tsunami que azoto a Japón el 11 de Marzo. Foto: AGN

Según informó la Unesco, los países del litoral del Caribe recibirán mañana un aviso de alerta contra un presunto terremoto de magnitud 7.6, con epicentro frente a las costas de las Islas Vírgenes estadounidenses.

Alejandro Maldonado, director de la Coordinadora Nacional para la Reducción de Desastres (CONRED) confirmó la realización de este simulacro de tsunami en las costas del país pero informó de que es un simulacro técnico, que no afectará a la población.

Agregó que el Instituto Nacional de Sismología, Vulcanología, Metreeología e hidrología (Insivumhe) será el encargado de monitorear los resultados.

El proyecto fue organizado por el Sistema de Alerta Temprana contra los Tsunamis y otras Amenazas Costeras en el Caribe y Regiones Adyacentes, creado en 2005, bajo los auspicios de la Comisión Oceanográfica Intergubernamental (COI) de la Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (Unesco).

El tsumani falso ha sido denominado como “Caribe Wave 11″, no implica una movilización de las poblaciones de la región. Su objetivo se limita a probar la eficacia de los dispositivos de alarma, vigilancia y aviso de todos los organismos de la región encargados de la gestión de situaciones de emergencia.

Se sometreán a esta prueba Aruba; Antigua y Barbuda; Bahamas; Barbados; Belice; Brasil; Canadá; Colombia; Costa Rica; Cuba; Dominica; Estados Unidos; las islas francesas de Martinica, Guadalupe, Guyana y San Martín; Granada; Guatemala; Guyana; Haití; Honduras; Jamaica; México; Nicaragua; Países Bajos (Bonaire, Curazao, Saba, San Eustaquio y San Martín); Panamá; Perú; República Dominicana; Reino Unido (Anguila, Bermudas, Islas Caimán, Islas Turcos y Caicos, Islas Vírgenes Británicas y Montserrat); Saint Kitts y Nevis; San Vicente y las Granadinas; Santa Lucía; Sri Lanka; Suriname; Trinidad y Tobago, y la República Bolivariana de Venezuela.

Los boletines de alerta para Puerto Rico y las Islas Vírgenes serán emitidos desde el Centro de Alerta contra los Tsunamis de la Costa Oeste y Alaska (Estados Unidos) y, para el resto de la región del Caribe desde el Centro de Alerta contra los Tsunamis en el Pacífico, situado en Ewa Beach (Hawai-Estados Unidos).

“El terremoto y el tsunami que acaban de azotar a Japón con las trágicas consecuencias que todos sabemos han mostrado la importancia fundamental que tienen los dispositivos de alerta. La puesta a punto de un sistema coordinado en la región del Caribe es más pertinente que nunca para facilitar la preparación de los países ribereños de este mar contra la eventualidad de una catástrofe semejante”, afirmó la directora general de la Unesco, Irina Bokova.

En los últimos cinco siglos, el Caribe ha sido azotado por 75 tsunamis, lo que representa un 10% del total mundial de los fenómenos de este tipo observados en ese periodo.

Provocados por terremotos y desprendimientos de terrenos o por la actividad volcánica, los tsunamis han causado la muerte de más de 3.500 personas en la región caribeña desde mediados del siglo XIX, según datos facilitados por la Administración Nacional Oceánica y Atmosférica de los Estados Unidos.

http://noticias.com.gt/nacionales/20110323-guatemala-participara-en-simulacro-de-tsunami.html

Guatemala participar en simulacro de un tsunami

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No implica movilización de la población

El tsumani falso ha sido denominado como "Caribe Wave 11", no implica una movilización de las poblaciones de la región. Su objetivo se limita a probar la eficacia de los dispositivos de alarma, vigilancia y aviso de todos los organismos de la región encargados de la gestión de situaciones de emergencia.

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región del Caribe desde el Centro de Alerta contra los Tsunamis en el Pacífico, situado en Ewa Beach (Hawai-Estados Unidos).

"El terremoto y el tsunami que acaban de azotar a Japón con las trágicas consecuencias que todos sabemos han mostrado la importancia fundamental que tienen los dispositivos de alerta. La puesta a punto de un sistema coordinado en la región del Caribe es más pertinente que nunca para facilitar la preparación de los países ribereños de este mar contra la eventualidad de una catástrofe semejante", afirmó la directora general de la Unesco, Irina Bokova.

75 tsunamis en 500 años

En los últimos cinco siglos, el Caribe ha sido azotado por 75 tsunamis, lo que representa un 10% del total mundial de los fenómenos de este tipo observados en ese periodo.

Provocados por terremotos y desprendimientos de terrenos o por la actividad volcánica, los tsunamis han causado la muerte de más de 3.500 personas en la región caribeña desde mediados del siglo XIX, según datos facilitados por la Administración Nacional Oceánica y Atmosférica de los Estados Unidos.

POR PRENSA LIBRE.COM Guatemala

http://www.prensalibre.com/noticias/comunitario/Guatemala-efecutara-simulacro-tsunami_0_448755439.html

HONDURAS

Honduras participará en simulacro de tsunami

Honduras forma parte de los países que podrían ser afectados por un tsunami.

17.03.11 – Actualizado: 17.03.11 04:00pm – Redacción/AFP: redaccion@elheraldo.hn

Washington,

Estados Unidos

La preparación del Caribe para un desastre natural, como el que azotó Japón hace una semana, será puesta a prueba cuando su sistema de alerta de maremotos sea sometido a simulacro.

Treinta y tres países, entre ellos Honduras, están listos para participar en el ejercicio del 23 de marzo, planificado por la Organización de Naciones Unidas para la Educación, la Ciencia y la Cultura (Unesco).

El ejercicio, denominado Caribe Wave 2011, intenta probar la eficacia de los dispositivos de alarma, vigilancia y aviso de todos los organismos de la región encargados de la gestión de situaciones de emergencia; no obstante, no implica una movilización de las poblaciones de la región.

En Centroamérica, el simulacro es manejado por el Centro de Coordinación para la Prevención de los Desastres Naturales en América Central (Cepredenac), parte del Sistema de Integración Centroamericana (Sica), e incluye además de Honduras a Belice, Guatemala, Nicaragua, Costa Rica, y Panamá.

La simulación se hace en respuesta al sismo y posterior maremoto que devastaron Japón, que dejaron miles de muertos y desaparecidos y desataron una grave crisis nuclear.

La directora general de la Unesco, Irina Bokova, dijo que la experiencia de Japón muestra "lo esenciales que son los sistemas de alerta".

"En este contexto el desarrollo de un sistema coordinado en el Caribe es más relevante que nunca, porque permite a los países costeros prepararse en caso de un desastre así y salvar vidas humanas", dijo Bokova en un comunicado.

Se simulará un terremoto de magnitud 7.6 frente a la costa de las estadounidenses Islas Vírgenes. Luego se emitirán boletines en toda la región, dirgidos a estaciones de guardacostas y otras oficinas gubernamentales.

Los boletines de alerta para la región del Caribe serán emitidos desde el Centro de Alerta contra los Tsunamis en el Pacífico (PTWC), situado en Ewa Beach, Hawai, Estados Unidos.

En los últimos cinco siglos, el Caribe fue azotado por 75 tsunamis, lo que representa un 10 por ciento del total mundial de los fenómenos de este tipo observados en ese largo período.

Provocados por terremotos, desprendimientos de terrenos o por la actividad volcánica, los tsunamis han causado la muerte de más de 3,500 personas en la región caribeña desde mediados del siglo XIX, según datos facilitados por la Administración Nacional Oceánica y Atmosférica de los Estados Unidos (NOAA).

El sistema de alerta intergubernamental fue establecido en 2005 por los países de la región en colaboración con la Comisión Oceanográfica Intergubernamental (COI) de la Unesco.

http://www.elheraldo.hn/Ediciones/2011/03/17/Noticias/Honduras-participara-en-simulacro-de-tsunami

JAMAICA

Tsunami drill unveils glitches

A U.N.-organized tsunami drill was held last week in the Caribbean, and TC hears the exercise turned up a few glitches in the system. (At least nine tsunamis have hit the Caribbean since the mid-1800s, killing more than 3,500.)

Officials in the Dominican Republic, for example, discovered a lack of evacuation plans. In the U.S. Virgin Islands, alerts and warnings were broadcast on radio stations in Spanish but not in English, and the overall emergency broadcast signal was weak. In Puerto Rico, many residents never even heard the sirens meant to alert them to an oncoming tsunami.

There were successes, however.

Bahamian emergency workers were able to issue an alert through text messages sent to 300 officials across the island chain.

Jamaica’s previous training sessions with staffers to improve disaster preparedness skills indicated high scores in that area.

http://www.travelweekly.com/Travel-Confidential/Tsunami-drill-unveils-glitches/

SINT MAARTEN

Region-wide Tsunami Warning Exercise on Wednesday based on 7.6 magnitude earthquake near USVI

GREAT BAY, Sint Maarten (DCOMM) – On Wednesday, March 23, according to United Nations Educational, Scientific, and Cultural Organizations (UNESCO) Intergovernmental Oceanographic Commission (IOC), 33 countries are preparing to participate in a Caribbean-wide earthquake/tsunami exercise based on a 7.6 magnitude earthquake near the U.S. Virgin Islands.

On Wednesday morning, according to the scenario, countries in the Caribbean will receive an alert concerning a fictitious earthquake. Bulletins will be issued by the West Coast/Alaska Tsunami Warning Center (United States) for Puerto Rico and the Virgin Islands, and by the Pacific Tsunami Warning Center in Ewa Beach (Hawaii, US) for the rest of the area a few minutes after the fictitious earthquake.

The exercise does not involve communities. The goal is to test the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, which was established in 2005 by the countries of the region in collaboration with UNESCO and IOC.

The effectiveness of alert, monitoring and warning systems among all the emergency management organizations (national focal points for tsunami alerts, weather forecast offices, national coast guard etc.) throughout the region will be tested. The test is designed to determine whether Caribbean countries are ready to respond in the event of a dangerous tsunami.

Previous experience underlines the crucial importance of rapid transmission of information. It has shown that national authorities must take risk into account at all levels, including education about hazards in schools, urban planning in coastal zones, modification of building codes and materials, evacuation plans for communities and organization of effective emergency services.

The Office of Disaster Management by mobilizing its Emergency Operations Center (EOC) which includes the 10 Emergency Support Functions (ESF) to participate in a workshop at 10am on March 23 at the Fire & Ambulance Building in Cay Hill.

The region-wide tsunami drill is referred to as “Exercise Caribe Wave 11/LANTEX.” The drill will allow the country’s ESF coordinators in a workshop setting to discuss possible actions to be taken, the flow of information, warnings to the population, evacuation etc.

“The exercise for Sint Maarten will lead to the development of a tsunami response plan. Preparing for an earthquake/tsunami situation is very different than preparing for a hurricane. There is no warning of an earthquake; however you do get some time to take action when a tsunami warning has been issued.

“I fully agree with UNESCO Director-General Irina Bokova, who said that the earthquake and tsunami that have devastated part of Japan have shown how essential alert systems are,” Fire Commander/Disaster Coordinator Winston Salomon told the Department of Communications (DCOMM) on Monday.

Bokova added in a UNESCO press release, that the development of a coordinated system in the Caribbean is more relevant than ever, enabling coastal communities to prepare in the event of such a disaster and to save human lives.

Over the last 500 years, 75 tsunamis have occurred in the Caribbean. This figure represents about 10 per cent of the entire number of oceanic tsunamis in the world during that period.

Roddy Heyliger (599-5204217, roddyheyliger at gmail.com)

Department of Communications (DCOMM), Sint Maarten

Best regards, Roddy Heyliger – BB pin 21437DBEP.O.Box 945, Philipsburg, St. Maarten Cell: 5204217-primary, 5816323-secondaryPublic Relations & Communications

Secondary Email: roddyheyliger at yahoo.com

http://www.stormcarib.com/reports/current/stmartin.shtml

Region-wide Tsunami Warning Exercise on Wednesday

POSTED: 03/22/11 12:25 PM

St. Maarten – Thirty three countries across the Caribbean, St. Maarten included will participate in a region wide earthquake/tsunami exercise on Wednesday. Coordinated by the United Nations Educational, Scientific, and Cultural Organizations (UNESCO) Intergovernmental Oceanographic Commission (IOC) the exercise will be based on the fictitious occurrence of an earthquake near the U.S. Virgin Islands that has a 7.6 magnitude on the Richter scale.

According to the scenario countries in the Caribbean will receive an alert concerning the fictitious earthquake on Wednesday morning. Bulletins will be issued by the West Coast/Alaska Tsunami Warning Center (United States) for Puerto Rico and the Virgin Islands, and by the Pacific Tsunami Warning Center in Ewa Beach (Hawaii, US) for the rest of the area a few minutes after the fictitious earthquake.

The exercise does not involve communities. The goal is to test the Tsunami and other coastal hazards warning system for the Caribbean and adjacent regions, which was established in 2005 by the countries of the region in collaboration with UNESCO and IOC. The effectiveness of alert, monitoring and warning systems among all the emergency management organizations (national focal points for tsunami alerts, weather forecast offices, national coast guard etc.) throughout the region will be tested. The test is designed to determine whether Caribbean countries are ready to respond in the event of a dangerous tsunami.

“Previous experience underlines the crucial importance of rapid transmission of information. It has shown that national authorities must take risk into account at all levels, including education about hazards in schools, urban planning in coastal zones, modification of building codes and materials, evacuation plans for communities and organization of effective emergency services,” a release from the Department of Communications stated.

The Office of Disaster Management by mobilizing its Emergency Operations Center (EOC) which includes the 10 Emergency Support Functions (ESF) to participate in a workshop at 10:00 a.m. on March 23 at the Fire & Ambulance Building in Cay Hill. The region-wide tsunami drill is referred to as “Exercise Caribe Wave 11/LANTEX.”The drill will allow the country’s ESF coordinators in a workshop setting to discuss possible actions to be taken, the flow of information, warnings to the population, evacuation etc.

“The exercise for St. Maarten will lead to the development of a tsunami response plan. Preparing for an earthquake/tsunami situation is very different than preparing for a hurricane. There is no warning of an earthquake; however you do get some time to take action when a tsunami warning has been issued. I fully agree with UNESCO Director-General Irina Bokova, who said that the earthquake and tsunami that have devastated part of Japan has shown how essential alert systems are,” Fire Commander/Disaster Coordinator Winston Salomon told the Department of Communications (DCOMM) on Monday.

Bokova added, in a UNESCO press release, that the development of a coordinated system in the Caribbean is more relevant than ever, enabling coastal communities to prepare in the event of such a disaster and to save human lives.

Over the last 500 years, 75 tsunamis have occurred in the Caribbean. This figure represents about 10 per cent of the entire number of oceanic tsunamis in the world during that period.

http://www.todaysxm.com/2011/03/22/region-wide-tsunami-warning-exercise-on-wednesday/

Tsunami workshop exercise a success; early warning key to saving lives

POSTED: 03/24/11 12:35 PM

St. Maarten – Section Head of Disaster Management Paul Martens has called the workshop that brought together the 10-Emergency Support Functions (ESFs) of the Emergency Operations Center (EOC) to carry out a Caribbean-wide earthquake/tsunami exercise, “a success that will lead to the development of a national tsunami response plan for the country.” The exercise was based on a 7.6 magnitude earthquake near the U.S. Virgin Islands that triggered a 2.5 metre high tsunami that would hit the airport and Simpson Bay.

Minister of Public Health, Social Development and Labour Cornelius de Weever and Emilia Thomas from the Cabinet of the Prime Minister also attended the earthquake/tsunami scenario that took place in the conference room of the Fire & Ambulance Dept. in Cay Hill. The EOC meeting was chaired by National Disaster Coordinator Fire Chief Winston Salomon.

During the table top exercise, communicating the tsunami warning information to the Fire Department and Police quickly was key in order for them to be mobilized to direct traffic in order to prevent traffic jams and for the effective evacuation of the area to be impacted by a tsunami. The ESFs were informed that a tsunami wave effect model is being created for the island with the assistance of UNESCO-IHE and the R3I project. The model is seen as a critical component that would benefit disaster prevention and preparedness. Another essential point was that the island needs its own Meteorological Office that would issue the warning rather than depending on the Curacao Meteo Service.

Evacuation of residents along the coast and low lying areas inland was discussed extensively. Such an evacuation process would have to be done in an orderly manner and designated safe areas would have to be determined. Early warning of coastal communities would be done via the disaster office sirens, emergency service vehicles, radio stations, SMS text messages, and email linked to blackberry services. The message would be multi-language, clear and instructive. A public awareness tsunami campaign is considered the foundation for having the population prepared and also knowing exactly what action they would have to take once a tsunami warning has been issued by the authorities.

Other major points of discussion were the evacuation of the airport, how to deal with cruise ships in the harbour and the evacuation of hotels and schools. Further study is required with respect to the aforementioned, and the Ministry of Housing, Spatial Planning, Environment and Infrastructure (VROMI) and the Police are busy developing a new evacuation plan for certain areas of the island. A tsunami scenario will also be included in this plan.

Cooperation with the North side of the island was seen as essential during a disaster situation and a tsunami in particular.

The workshop was based on a United Nations Educational, Scientific, and Cultural Organizations (UNESCO) Intergovernmental Oceanographic Commission (IOC), earthquake/tsunami exercise. The goal of the exercise was to test the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, which was established in 2005 by the countries of the region in collaboration with UNESCO and IOC. The region-wide tsunami drill was referred to as “Exercise Caribe Wave 11/LANTEX.”

Over the last 500 years, 75 tsunamis have occurred in the Caribbean.This figure represents about 10 per cent of the entire number of oceanic tsunamis in the world during that period.

http://www.todaysxm.com/2011/03/24/tsunami-workshop-exercise-a-success-early-warning-key-to-saving-lives/

NICARAGUA

Nicaragua participa en simulacro terremoto y tsunami en Mar Caribe

El ejercicio estuvo dirigido a poner a prueba los sistemas de comunicación de los países de Centroamérica y el Caribe.

Escrito por DPA Miércoles, 23 marzo 2011 17:51

Nicaragua puso a prueba hoy sus mecanismos de alerta al participar de un simulacro de un terremoto de 7,6 grados en la escala de Richter y un posterior tsunami en el Mar Caribe, como parte de un trabajo de prevención realizado en coordinación con otros países del área.

Técnicos del Instituto de Estudios Territoriales (Ineter) recibieron el aviso del sismo virtual detectado cerca de Puerto Rico y que fue captado por el Centro de Alerta de Tsunamis del Pacífico, ubicado en Hawaii.

La alerta pasó inmediatamente al Centro de Tsunamis de Alaska, que a su vez emitió una alarma a 20 países de la región que tienen costas sobre el Mar Caribe, explicó un vocero del Ineter.

"Defensa Civil: hemos recibido una alerta de tsunami para el Caribe. Quiero comprobar la recepción de esta comunicación. Cambio", dijo el meteorólogo del Ineter. Al otro lado de la línea, un oficial respondió: "De acuerdo, mensaje copiado".

De inmediato, la entidad adscrita al Ejército activaría el sistema de alerta temprana para poner en movimiento a los 16 comités provinciales y los 144 municipales de la Defensa Civil en todo el país, conforme los planes establecidos.

El ejercicio estuvo dirigido a poner a prueba los sistemas de comunicación de los países de Centroamérica y el Caribe.

Aunque los maremotos en el Mar Caribe no son frecuentes, desde el tsunami ocurrido en Sumatra en 2005 los países caribeños cuentan con un Sistema de Alerta Temprana, creado a instancias de la Comisión Oceanográfica Intergubernamental (COI).

Se estima que en los últimos 500 años han ocurrido 75 tsunamis en el Mar Caribe, un 10 por ciento de los maremotos observados desde entonces a nivel mundial.

La mayoría de esos fenómenos han sido provocados por sismos, desprendimientos de tierra y actividad volcánica, causando la muerte de al menos 3.500 personas.

Tras el devastador terremoto en Japón hace 12 días, Nicaragua y otros 19 países de América recibieron una alerta de tsunami en el Oceáno Pacífico que se prolongó durante más de 12 horas.

http://www.laprensagrafica.com/el-salvador/lodeldia/180148-nicaragua-participa-en-simulacro-terremoto-y-tsunami-en-mar-caribe.html

Nicaragua participa en simulacro de tsunami

Published on Thursday, 24 March 2011 04:28

Hits: 44

Como parte de un ejercicio regional en el que participaron más de 20 países del Caribe, este miércoles el INETER y la Defensa Civil del Ejército de Nicaragua, realizaron un simulacro de alerta de tsunami en la Costa Caribe del país, con la finalidad de comprobar la efectividad de los mecanismos de comunicación ante una emergencia de este tipo.

La voz de alerta se dio a eso de las 8 de la mañana ante un supuesto terremoto de magnitud 7.6 próximo a Puerto Rico. Tras el sismo el Centro de Alerta del Tsunami del Pacífico emitió una alerta de maremoto para toda la región del Caribe centroamericano.

En Nicaragua dicho aviso fue recepcionado por el Departamento de Sismología del Ineter, el que de manera inmediata envió la información a Defensa Civil para la puesta en marcha del plan contingente de emergencia a nivel central y territorial.

“Nosotros enviamos esta información a la Defensa Civil, para que diseminara la información a través de sus medios de comunicación. Lo que básicamente queremos es ver el tiempo en que la información para Bilwi y Bluefields”, dijo el ingeniero Emilio Talavera, sismólogo del Ineter.

Según el teniente coronel Luis Acosta, de la Defensa Civil, ante cualquier aviso de tsunami la emergencia se activa de manera automática ya que el sistema de radiocomunicaciones permanece activo las 24 horas del días en las comunidades, casas de líderes comunitarios y puestos de mando de las alcaldías”, indicó.

Norman Sánchez, director de operaciones del Sistema Nacional de Prevención, Atención y Mitigación de Desastres, SINAPRED, dijo que por lo general se habla de alertas de tsunami en las

costas del pacífico, sin tomar en cuenta que el litoral Caribe también es propenso a este tipo de fenómenos.

Entre el resto de países participantes del simulacro algunos como Puerto Rico, Barbados, Santa Lucía, Martinica, Antillas Mayores y Menores realizaron un simulacro completo, es decir con movilización de personal y evacuaciones.

La compañera Ángela Muñoz, directora de Geofísica del INETER, indicó que el mes de noviembre se realizará otro simulacro ante tsunami pero en la región del pacífico, donde se tiene previsto movilizar personas.

http://www.nuevaya.com.ni/principales/8-portada-portada/1188-nicaragua-participa-en-simulacro-de-tsunami.html

Simulacro de tsunami este miércoles en Nicaragua y otros países del Caribe

INETER
Instituto Nicaragüense de Estudios Territoriales

Se probará el sistema de comunicación y prevención para hacer frente a un evento de este tipo

Exitoso simulacro de alerta de tsunami efectuó Nicaragua

22 de marzo de 2011 | 22:17:23

Nicaragua y todos los países situados en la Cuenca del Caribe realizarán este miércoles un simulacro de tsunami, evento trascendente para mantener funcionando correctamente lo sistemas de comunicación y prevención.

Este ejercicio comenzará a las siete de la mañana y permitirá revisar las condiciones de cada nación del ´área para enfrentar cualquier situación relacionada con un tsunami.

El director del Instituto Nicaragüense de Estudios Territoriales (INETER), ingeniero Alejandro Rodríguez, explicó recientemente que el objetivo primordial es probar nuestro sistema de comunicación, ver si están funcionando y ver si la alerta también funciona.

Rodríguez, reveló que en la reciente emergencia originada por el terremoto y tsunami de Japón, todo el tiempo mantuvo comunicación con la directora del Centro Internacional de Alerta de Tsunami en Hawai, Laura Kong.

“La simulación de simulacro será a las 7 de la mañana en punto, hora de Nicaragua, con un terremoto de 7.6 en la escala abierta de Richter y otro ocurrido cinco minutos más tarde, cuyo epicentro será en las Islas Vírgenes del Caribe”, dijo la compañera Ángela Muñoz, Directora de Geofísica del INETER.

La doctora Muñoz, indicó que además de la comunicación entre las instituciones algunos países como Puerto Rico, Barbados, Santa Lucía, Martinica, Antillas Mayores y Menores realizarán un simulacro completo, es decir con movilización de personal y evacuaciones.

Para el mes de noviembre realizaremos otro simulacro de tsunami pero en esta ocasión será en el Pacífico centroamericano, dijo la doctora Ángela Muñoz.

http://www.lavozdelsandinismo.com/nicaragua/2011-03-22/simulacro-de-tsunami-este-miercoles-en-nicaragua-y-otros-paises-del-caribe/

Exitoso simulacro de alerta de tsunami efectuó Nicaragua

Se comprobó la efectividad de los mecanismos de comunicación ante una emergencia de esas características

23 de marzo de 2011 | 20:31:17

El Instituto Nicaragüense de Estudios Territoriales (Ineter) y la Defensa Civil realizaron exitosamente un simulacro de alerta de tsunami en la Costa Caribe del país con el objetivo de comprobar la efectividad de los mecanismos de comunicación ante una emergencia de este tipo.

Este simulacro fue parte de un ejercicio regional en el que participaron más de 20 países del Caribe, una zona no muy propensa a este tipo de fenómenos, pero en la que sí se han detectados factores de riesgo como erupciones volcánicas y terremotos.

La voz de alerta se dio a las ocho de la mañana ante un supuesto terremoto de magnitud 7.6 próximo a Puerto Rico. Tras el sismo el Centro de Alerta del Tsunami del Pacífico emitió una alerta de maremoto para toda la región.

En Nicaragua dicho aviso fue recepcionado por el Departamento de Sismología del Ineter el que, de manera inmediata, envió la información a Defensa Civil para la puesta en marcha del plan contingente de emergencia a nivel central y territorial.

“Nosotros enviamos esta información a la Defensa Civil para que ella esté diseminando la información a través de sus medios de comunicación. En este caso nosotros estamos simulando este ejercicio para dos comunidades en particular: Bilwi y Bluefields. Lo que queremos es ver el tiempo en que la información va a llegar hasta estos puntos”, explicó el ingeniero Emilio Talavera, sismólogo del Ineter.

Según el teniente coronel Luis Acosta, de la Defensa Civil, ante cualquier aviso de tsunami la emergencia se activa de manera automática ya que el sistema de radiocomunicaciones permanece activo las 24 horas del día.

“Las comunicaciones son permanentes las 24 horas, ya que la fortaleza nuestra es que las estaciones (de radio) están instaladas en las comunidades, en las casas de líderes comunitarios y en los puestos de mando de las alcaldías”, indicó Acosta.

Norman Sánchez, director de operaciones del Sistema Nacional de Prevención, Atención y Mitigación de Desastres (Sinapred), destacó la importancia de este ejercicio, ya que por lo general se habla de alertas de tsunami en las costas del Pacífico, sin tomar en cuenta que el litoral Caribe también es propenso a este tipo de fenómenos.

“La fortaleza de Nicaragua es que tenemos un tendido de comunicaciones que nos permite dar la señal en tiempo real a las diferentes comunidades que puedan estar en riesgo”, explicó.

http://www.lavozdelsandinismo.com/nicaragua/2011-03-23/exitoso-simulacro-de-alerta-de-tsunami-efectuo-nicaragua/

Nicaragua participa en simulacro terremoto y tsunami en Mar Caribe

La medida fue tomada como parte de un trabajo de prevención realizado en coordinación con otros países.

Nicaragua puso a prueba hoy sus mecanismos de alerta al participar de un simulacro de un terremoto de 7,6 grados en la escala de Richter y un posterior tsunami en el Mar Caribe, como parte de un trabajo de prevención realizado en coordinación con otros países del área.

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De inmediato, la entidad adscrita al Ejército activaría el sistema de alerta temprana para poner en movimiento a los 16 comités provinciales y los 144 municipales de la Defensa Civil en todo el país, conforme los planes establecidos.

El ejercicio estuvo dirigido a poner a prueba los sistemas de comunicación de los países de Centroamérica y el Caribe.

Aunque los maremotos en el Mar Caribe no son frecuentes, desde el tsunami ocurrido en Sumatra en 2005 los países caribeños cuentan con un Sistema de Alerta Temprana, creado a instancias de la Comisión Oceanográfica Intergubernamental (COI).

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La mayoría de esos fenómenos han sido provocados por sismos, desprendimientos de tierra y actividad volcánica, causando la muerte de al menos 3.500 personas.

Tras el devastador terremoto en Japón hace 12 días, Nicaragua y otros 19 países de América recibieron una alerta de tsunami en el Oceáno Pacífico que se prolongó durante más de 12 horas.

http://www.cronica.cl/noticias/site/artic/20110323/pags/20110323204612.php

Centro América realizará simulacro de tsunami

Managua. El 19 Digital. | 15 marzo de 2011

El Director del Instituto Nicaragüense de Estudios Territoriales (INETER), Alejandro Rodríguez, anunció que el 23 de marzo se realizará un simulacro de tsunami en el Pacífico con la participación de todos los países de la región centroamericana, para probar el sistema de

comunicación y prevención que permita hacerle frente a un evento como el ocurrido en Japón hace unos días

“La intención primordial es probar nuestro sistema de comunicación, ver si están funcionando, ver si la alerta funciona”, señaló Rodríguez, al revelar que mantuvo comunicación todo el tiempo con la directora del Centro Internacional de Alerta de Tsunami en Hawaii, Laura Kong.

Sobre la alerta verde decretada por el gobierno que preside el comandante Daniel Ortega Saavedra, destacó el grado de organización de la población y de las instituciones del SINAPRED, como Defensa Civil, entre otros.

“Me quedó una gran satisfacción de ver la capacidad organizativa de nuestro pueblo. Es cierto que las instituciones pusimos nuestro granito de arena, cada quien en el ámbito que le corresponde, pero quien finalmente llevó a cabo la organizativa, eran las autoridades municipales, las organizaciones populares y el pueblo mismo. Y la verdad que funcionó”, dijo.

Sostuvo que aunque no ocurrieron las proyecciones del tsunami, la lección es que “es mejor prevenir que lamentar, aunque las probabilidades que se nos viniera una ola de nueve metros como la de 1992 eran muy bajas, ¿pero qué tal si se nos viene y nos encuentra otra vez desprevenidos?”.

Explosión nuclear sería grave para entorno cercano

Rodríguez se refirió a las consecuencias de una explosión nuclear en Japón y afirmó que de ocurrir este hecho en las plantas de energía que sufrieron daños producto del terremoto de 9.1 en la escala de Richter, provocaría un daño irreversible a todo ser vivo que se encuentre en su entorno.

Rodríguez dio remotas posibilidades que la nube nuclear que se produciría producto de la explosión, afectara el continente americano, pues dependería mucho de la dirección del viento y de la velocidad de los mismos.

“Primero va a dañar a los seres humanos que estén al alcance, después va a dañar a las plantas, va a dañar animales, va a contaminar el agua”, explicó.

“Está un poco lejos, estamos a 12 mil kilómetros, tendría que haber una serie de circunstancias muy favorables de condiciones atmosféricas como para que esa nube recorriera esos 12 mil kilómetros y nos llegara… yo creo que es bastante difícil porque eso va a depender de los vientos”, señaló el experto.

Rodríguez cifró sus esperanzas que los científicos e ingenieros que trabajan en anular el riesgo de explosión nuclear en las plantas, logren restablecer el funcionamiento, para el bien de la humanidad.

http://www.radiolaprimerisima.com/noticias/general/95304/centro-america-realizara-simulacro-tsunami

PANAMÁ

SINAPROC realiza simulacro de tsunami

Miércoles, 23 de marzo de 2011

El Sistema Nacional de Protección Civil (SINAPROC) movilizó hoy a sus unidades en preparación para un hipotético tsunami.

La movilización de vehículos y atención de posibles víctimas se hizo para determinar las fortalezas y debilidades de Panamá ante la posibilidad que se registre un tsunami.

El Director del SINAPROC, Arturo Alvarado dijo que estos preparativos estaban programados con anticipación al terremoto y tsunami que asoló a Japón.

Admitió que ningún país del mundo está preparado para enfrentar un tsunami, tal como se evidenció en Japón.

Alvarado dijo que hay deficiencias en el plan preventivo en las escuelas, por lo que con este Gobierno se ha decidido reforzarlo.

No obstante, informes destacados por BBC Mundo precisan que el simulacro llamado "Caribe Wave" se realiza en 33 países del Caribe, incluida Panamá, luego de la catástrofe que azotó a Japón, para probar la eficacia del sistema de alerta contra este tipo de desastre.

El simulacro no implicará ninguna acción de los habitantes de la región sino que se limitará a probar el funcionamiento de los dispositivos de alarma y vigilancia.

http://tvn-2.com/noticias/noticias_detalle.asp?id=49001

Realizan en Panamá simulacro de tsunami

El Sistema Nacional de Protección Civil (SINAPROC) de Panamá realizó un simulacro de tsunami con el fin de detectar las debilidades del país para hacer frente a ese tipo de fenómenos

23/Mar/11 18:05

Como resultado del ejercicio se acordó que las entidades miembros del Centro de Operaciones de Emergencias (COE) del SINAPROC deben presentar sus planes de acción el próximo 30 de marzo, con el fin de establecer un protocolo de atención.

En el próximo encuentro se actualizará la información "para optimizar las rutas de desalojo y sitio seguros para que la población pueda acudir ante un eventual desastre", indicó el director del SINAPROC, Arturo Alvarado.

El "simulacro de mesa" se desarolló en las instalaciones del SINAPROC en la ex base militar de Howard. Alvarado indicó que el simulacro "mejorará significativamente el grado de respuesta ante un desastre similar".

El simulacro formó parte de un ejercicio regional coordinado por la Organización de Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO) y la Agencia para la Atmósfera de Estados Unidos (NOAA), para el Atlántico occidental y el Caribe.

Durante la práctica, los centros de alerta de tsunami emitieron mensajes ficticios de alerta, alarma y advertencia de marejadas basados en un terremoto hipotético de 7.6 grados en la escala de Richter situado cerca de Islas Vírgenes.

Alvarado dijo que el simulacro se preparó antes del devastador terremoto y tsunami de Japón del pasado 11 de marzo.

http://info7.mx/a/noticia/256185

Realizan en Panamá simulacro de tsunami

Escrito por Redacción Miércoles, 23 de Marzo de 2011 13:25

15:03 El Sistema Nacional de Protección Civil (SINAPROC) de Panamá realizó hoy un simulacro de tsunami con el fin de detectar las debilidades del país para hacer frente a ese tipo de fenómenos.

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Alvarado dijo que el simulacro se preparó antes del devastador terremoto y tsunami de Japón del pasado 11 de marzo.

http://www.ochocolumnas.com.mx/index.php/general/internacional/2460-realizan-en-panama-simulacro-de-tsunami.html

ST. VINCENT AND THE GRENADINES

St. Vincent and the Grenadines to participate in the Caribbean Tsunami Warning Exercise

Tuesday, 22 March 2011 15:49

The National Emergency Management Organisation (NEMO) will participate in "EXERCISE CARIBE WAVE II – A Caribbean Tsunami Warning Exercise" to take place on the 23rd March 2011. This exercise is being conducted to assist preparedness efforts throughout the Caribbean region for tsunami hazard. According to a release from NEMO, St. Vincent and the Grenadines participation will be in the form of an Orientation Exercise. Director (Ag) NEMO, Michelle Forbes stated that recent events such as the Japan earthquake and tsunami, and the 2010 Haiti earthquake and tsunamis, attest to the importance of proper planning for tsunami preparedness and response.

The objectives of the exercise are to discuss the key protocols that need to be developed for tsunami preparedness and early warnings in the event of a tsunami; to discuss the role of key agencies in tsunami response using scenarios; to review the Tsunami National Focal Point (TNFP) and Tsunami National Contact (TNC), to discuss and evaluate potential response actions and challenges and to develop a work plan for implementing tsunami protocols for St. Vincent and the Grenadines.

The Orientation Exercise will commence at 8:30am at NEMO's Conference Room.

http://www.gov.vc/index.php?option=com_content&view=article&id=377:st-vincent-and-the-grenadines-to-participate-in-the-caribbean-tsunami-warning-exercise&catid=43:government-news&Itemid=159

UNITED KINGDOM

ANGUILLA

Anguilla joins region in first tsunami exercise

Publishing date: 25.03.2011 11:37

A considerable amount of excitement was generated on Wednesday morning, March 23, when Anguilla joined in participating in an International Tsunami Exercise code-named Caribe Wave 11/Lantex.

The excitement was at Island Harbour where membersof the Risk Reduction Committee, the Royal Anguilla Police Force, the Red Cross, students of the Vivien Vanterpool Primary School and other stakeholders, including fishermen, were among the key-players. Children and teachers ran from the school, along with members of the community, to the top area in the Keys Village, one of the evacuation points in the area. The other planned potential evacuation points are the Island Harbour/Welches/Shoal Bay junction near the residence of TodvilleHarrigan; up at Eudoxie's residence and at the top of the White Hill which would later be defined.

The informative and educational exercise was aimed at enhancing the island's capacity to mitigate disaster events

The exercise was sponsored by the International Oceanographic Committee of UNESCO, the US National Oceanographic Atmospheric Agency as well as various bodies and stakeholders.

It was organised to assist with tsunami preparedness efforts throughout the Caribbean and North America. It gave the Department of Disaster Management the opportunity to test newly-revised procedures for activating the national warning systems, new technologies recently acquired via the IGC CARIBE Tsunami Project, and to help to advance the island's Community-based Mitigation Programme.

The case for the exercise was explained in a press release issued by the Department of Disaster Management in Anguilla. It stated that recent natural disasters, such as the 2004 Indian Ocean and 2009 Samoa tsunamis, the 2010 Haiti and Chile earthquakes, and now the earthquake and subsequent tsunami in Japan, attested to the importance of proper planning for a tsunami response

According to the release, it was recently agreed for a regional Caribbean TsunamiWarning Centre to be located in Puerto Rico. The aim is to develop warning systems in the Caribbean region, enhancing thThe release noted that in the Caribbean region 3,510 people lost their lives to tsunamis since 1842. High risk tourism developments on the

with expansive population growth, increase.

http://www.anguillian.com/article/articleview/9507/

BRITISH VIRGIN ISLANDS

News Ticker

DDM reports tsunami sumulation exercise was a success

Students and other persons participating in the national simulation exercise.

The Department of Disaster Management held a simulation exercise in the territory this week to aid in their continued planning for disaster preparedness. The exercise took place on Wednesday, March 23.

Schools which included private and public primary and secondary institutions, the Eselyn Henley-Richez Learning Centre along with several government offices and a few private sector organisations participated in the National Earthquake and Tsunami Full Scale Simulation Exercise dubbed Caribwave/Lantex 11.

The Territory is participating in this event for the third year now. This year's exercise focused on assisting schools and emergency responders in testing their earthquake and tsunami preparedness efforts. Additionally, to determine the effectiveness of the National Emergency Broadcast, Alert and Communications Systems.

The exercise provided a simulated tsunami warning, watch and advisory messages from the West Coast Alaska Tsunami Warning Centre (WC/ATWC) and the Puerto Rico Seismic Network (PRSN) based on the 1867 event with a magnitude 7.6 earthquake located at 18.2 N, 65.3 W or near the Virgin Islands.

Training Officer at the DDM, Carishma Hicks said, "We have been planning this exercise for the past two months and it was our intention to test all national alert and broadcast systems and to physically evacuate schools, government offices, private sector agencies and to determine how this type of response would be performed."

Hicks added: "We also evaluated how the Royal Virgin Islands Police Force would secure key Government Officials who would be needed in the initial response phase. These exercises are especially important as they help to identify weaknesses in plans and procedures."

As part of the exercise the DDM sounded the 7 siren units located in The Settlement, North Sound, The Valley, Great Harbour, Cane Garden Bay, Russell Hill and East End. The National Emergency Broadcast System was activated and allowed for a test message to be sent simultaneously from the National Emergency Operations Centre to ZROD, ZBVI, ZKING and ZCCR and on Cable TV Channel 51.

In addition, 52 Smart radios located in schools, clinics, national parks posts, police and fire stations were activated providing a warning tone and a message which was designed to trigger an evacuation of these facilities.

The DDM also utilised its VHF and HF radio frequencies to send information to over 100 stations monitoring the network and to boaters listening on channel 16. Contact was also made with regional partners including Puerto Rico Seismic Network (PRSN).

Hicks further said, “We were pleased with the response especially from the schools. Evaluators were positioned at all schools to record their actions and provide advice on how plans and procedures can be improved based on the results documented.

Thirty-three countries were expected to participate in the exercise. The event was organized by the Intergovernmental Oceanographic Commission (IOC) established under the United National Educational, Scientific and Cultural Organisation (UNESCO).

Earthquake and tsunami events occurring in and around the Virgin islands are monitored by the West Coast Alaska Tsunami Warning Centre and the PRSN. These organisations provide notification to the DDM and the Royal Virgin Islands Police Force in the event that any earthquake or tsunami is recorded, based on a well-defined protocol.

PRSN, through an agreement with the Government of the Virgin Islands, has installed a number of seismic station and strong motion sensors throughout the Territory.

They monitor and maintain these units and have provided significant resources and technical support to the DDM for many years now.

http://bvinews.com/bvi/ddm-reports-tsunami-sumulation-exercise-was-a-success/

School prepare for national earthquake and tsunami exercise

Educators on tour at the Department of Disaster Management. Photo Courtesy of DDM

Principals and school administrators from public and private schools throughout the Territory gathered at the DDM on March 2, 2011 to discuss preparations for the upcoming National Earthquake and Tsunami Full Scale Simulation Exercise scheduled for this month.

This year’s event will focus on assisting schools and emergency responders in earthquake and tsunami preparedness efforts.

The exercise will provide simulated tsunami warning, watch and advisory messages from the Alaska Tsunami Warning Centre (ATWC) and the Puerto Rico Seismic Network (PRSN) based on a hypothetical magnitude 7.6 earthquake located near the Virgin Islands.

Schools will be expected to respond to the local early warning signals to be activated by the DDM and to fully implement their disaster management plans. Evaluators will be positioned at schools to assess the actions of principals, school administrators and students and to determine the effectiveness of school plans.

Planning and Preparedness Manager, Sheniah Armstrong in her presentation to the gathering said: “It is important for every institution to have a plan and for opportunities to be made available for testing these plans. There is also a legal requirement for Government departments, agencies and educational institutions to have these plans approved by the DDM in accordance with the Disaster Management Act, 2003.”

She further said: “Regular exercising of plans is critical to maintaining the desired level of readiness for an emergency especially in considering preparations for earthquakes and tsunamis which are infrequent but high impact events.”

On the day of the exercise students will be evacuated from their school compound and are expected to be taken to designated safe locations outlined in the institution’s disaster management plans. In addition, the National Tsunami Warning Protocols will be utilised to fully evaluate the actions of the National Emergency Operations Centre (NEOC) and to determine how effectively the Royal Virgin Islands Police Force handles messages once received.

In explaining why a full scale format for the exercise was chosen Training Officer Carishma Hicks said: “The Full Scale exercise format will allow for an actual deployment and mobilisation of appropriate personnel and resources needed to demonstrate operational capabilities.

The NEOC will undergo a full activation and emergency responders are expected to fully participate and to use the opportunity to test their plans as well.” She further said: “It is not the intention of the DDM to announce the date or time of the exercise because we want to have some level of realism built into the actions taking place to determine whether or not plans and procedures will actually work when a real event occurs.”

The exercise will be conducted in other counties including those in the Western Atlantic, Caribbean and adjacent regions. It is being designed and coordinated by the Inter-governmental Coordination Group for Tsunami and other Coastal Hazards Warning Systems for the Caribbean and adjacent regions.

http://bvinews.com/bvi/school-prepare-for-national-earthquake-and-tsunami-exercise/

CAYMAN ISLANDS

Caribbean Tsunami Exercise

The Cayman Islands will join other Countries in the Caribbean as a participant in a tsunami response exercise on March 23, 2011. The purpose of this exercise is to evaluate local tsunami response plans, increase tsunami preparedness, and improve coordination throughout the region.

“The vulnerability analysis that was conducted for Grand Cayman indicates that the threat of a damaging tsunami is low, but this exercise provides us with a useful opportunity to test the current procedures of the Tsunami Warning System and to look at our own communications protocol in the event that a tsunami wave is threatening the Cayman Islands. It is also a good opportunity for us to identify various operational strengths and weaknesses that would guide us in the development of our tsunami response plans” said McCleary Frederick, Director of HMCI.

The exercise, titled CARIBE WAVE 11/LANTEX 11, will simulate a widespread Tsunami Warning and Watch situation throughout the Caribbean which requires implementation of local tsunami response plans. It is the first such international exercise in the Caribbean region. The exercise will not include public notification.

The exercise will simulate a major earthquake and tsunami generated 25 miles southeast of Fajardo, Puerto Rico and 55 miles southeast of San Juan, Puerto Rico at 9:00am Atlantic Standard Time on March 23, 2011. Exercise participants will be provided with a handbook which describes the scenario and contains tsunami messages from the West Coast/Alaska Tsunami Warning Center (WC/ATWC) and the Pacific Tsunami Warning Center (PTWC). The WC/ATWC 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.

A number of local agencies will be participating in the exercise including 911, the Royal Cayman Islands Police Service, Cayman Islands National Weather Service and Government Information Services.

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.

http://www.caymanprepared.gov.ky/portal/page?_pageid=1143,5331066&_dad=portal&_schema=PORTAL

TRINIDAD AND TOBAGO

Exercise

Story Created: Mar 24, 2011 at 11:45 PM ECT

Story Updated: Mar 24, 2011 at 11:45 PM ECT

Officials from the Office of Disaster Preparedness and Management (ODPM) are in the process of completing a report on the results of the tsunami preparedness exercise which took place on Wednesday.

This according to Dike Noel of the Public Information, Education and Community Outreach Unit of the ODPM.

The report will be submitted to the Minister of National Security, John Sandy.

Noel told the Express yesterday that the exercise was effective and that the report will outline the areas that the exercise revealed needs improvement.

"The exercise was really to test our own operations, to ensure that each officer knew the duties they had to go through, to ensure that satellite phones and fax phones were working and to see how quickly messages were sent out," he said.

The UN organised tsunami drill entitled Caribe Wave 2011 tested the preparedness and response of Caribbean countries to a fictitious earthquake of 7.6 magnitude off the coast of the American Virgin Islands, generating a tsunami.

The simulated tsunami warning, watch and advisory messages was sent from the Pacific Tsunami Warning Centre in Hawaii to the Tsunami Warning Focal Points (TWFP) in the Caribbean region.

For Trinidad and Tobago, the TWFP is the Met Office.

According to a press release from the ODPM when the simulation was set in motion," the TT MET will then contact the ODPM and the Tobago Emergency Management Agency and these agencies will go through the motions of contacting other agencies and organisations and following the Tsunami Warning Protocol for country."

On Monday and Tuesday the ODPM met with representatives from 40 agencies to review and improve the National Tsunami Warning Protocol for Trinidad and Tobago.

http://www.trinidadexpress.com/news/ODPM_undergoes_tsunami_preparedness_exercise-118628644.html

ODPM participates in Exercise Caribe Wave 11 – A Caribbean Tsunami Warning Exercise

23 March, 2011 07:06:00

MEDIA RELEASE

Wednesday March 23, 2011 – 9: 15 a.m.

Trinidad and Tobago, represented by the Office of Disaster Preparedness and Management (ODPM) and the Trinidad and Tobago Meteorological Service (TT MET), is an active member of the Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS). The ICG/CARIBE EWS was established in 2005 as a subsidiary body of UNESCO's Intergovernmental Oceanographic Commission (IOC) with the purpose of providing assistance to all member states of the region to establish their own regional early warning system. It was formed in direct response to the lessons learnt from the 2004 Indian Ocean tsunami. The main objective of the CARIBE EWS is to identify and mitigate the hazards posed by local and distant tsunamis.

At the annual meeting held in March, 2010, the ICG CARIBE EWS proposed to hold a tsunami exercise, entitled Caribe Wave 2011, on March 23, 2011. Therefore, today, simulated tsunami warning, watch and advisory messages will be sent from the Pacific Tsunami Warning Centre (PTWC) in Hawaii, to the Tsunami Warning Focal Points (TWFP) in the Caribbean region. For Trinidad and Tobago, the TWFP is the Met Office. The TT MET will then contact the ODPM and the Tobago Emergency Management Agency (TEMA) and these agencies will go through the motions of contacting other agencies and organisations and following the Tsunami Warning

Protocol for the country. The general public will not be involved in this particular exercise. The messages will reflect a fictitious earthquake of 7.6 magnitude off the coast of the American Virgin Islands, generating a tsunami.

The tsunami exercise is being conducted to assist tsunami preparedness in the Caribbean region. According to the IOC, "the purpose of this exercise is to improve Tsunami Warning System effectiveness along the Caribbean coasts. This exercise provides an opportunity for emergency management organisations throughout the Caribbean to exercise their operational lines of communication, review their response procedures and promote tsunami preparedness."

Historical tsunami records from sources such as the National Oceanic and Atmospheric Administration's (NOAA) National Geophysical Data Centre (NGDC) show that almost 100 tsunamis have been observed in the Caribbean with 23 impacting the coasts of the region. Potential sources for tsunamis in the region include the faults in the Caribbean, steep shores offshore, subareal and submarine volcanoes, the region east of the Azores Islands, and portions of the continental slope off the US and Canadian coast due to sub-sea landslides.

Over the last two days, Monday March 21- Tuesday March 22, the ODPM met with representatives from forty (40) agencies and organisations (such as the Trinidad and Tobago Meteorological Service, the UWI Seismic Research Centre, the Government Information Service Limited, the Trinidad and Tobago Red Cross, the Trinidad and Tobago Publishers and Broadcasters Association, the Ministry of Housing and Environment, Ministry of Tobago Development, Trinidad and Tobago Coast Guard, Trinidad and Tobago Fire Service) to review and improve the National Tsunami Warning Protocol for Trinidad and Tobago. These protocols will be practiced/exercised during today's simulation Caribe Wave 11exercise.

The ODPM would like to stress that the public will not be involved in this exercise nor would the public be inconvenienced in any way.

Issued by:- Public Information, Education and Community Outreach Unit868 640 1285 ext 14240/ publicinformation@odpm.gov.tt

http://www.news.gov.tt/index.php?news=7404

Full-scale simulated tsunami alert in Caribbean

21 March, 2011 10:14:00

Paris, 17 March – Following the devastating tsunami that struck Japan, 33 countries* are preparing to participate on 23 March in the first full-scale simulated tsunami alert exercise in the Caribbean. The goal is to test the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, which was established in 2005 by the countries of the region in collaboration with UNESCO's Intergovernmental Oceanographic Commission (IOC).

According to the scenario developed by the organizers** of the exercise, countries in the Caribbean will receive an alert on 23 March concerning a fictitious earthquake of 7.6 magnitude off the coast of the American Virgin Islands. Bulletins will be issued by the West Coast/Alaska Tsunami Warning Center (United States) for Puerto Rico and the Virgin Islands, and by the Pacific Tsunami Warning Center (PTWC) in Ewa Beach (Hawaii, US) for the rest of the area.

The exercise, named Caribe Wave 11, does not involve communities. It aims to test the effectiveness of alert, monitoring and warning systems among all the emergency management

organizations (national focal points for tsunami alerts, weather forecast offices, national coast guard, etc.) throughout the region. The test is designed to determine whether Caribbean countries are ready to respond in the event of a dangerous tsunami.

Previous experience underlines the crucial importance of rapid transmission of information. It has also shown that national authorities must take risk into account at all levels, including education about hazards in schools, urban planning in coastal zones, modification of building codes and materials, evacuation plans for communities and organization of effective emergency services.

“The earthquake and tsunami that have devastated Japan have shown how essential alert systems are,” said UNESCO Director-General Irina Bokova. “In this context the development of a coordinated system in the Caribbean is more relevant than ever, enabling coastal countries to prepare in the event of such a disaster and to save human lives.”

Over the last 500 years, 75 tsunamis have occurred in the Caribbean. This figure represents about 10% of the entire number of oceanic tsunamis in the world during that period. Tsunamis – caused by earthquakes or landslides, or of volcanic origin – have killed more that 3500 people in the region since the mid-19th century (source: National Oceanic and Atmospheric Administration, NOAA). In recent decades, an explosion in population growth and the number of tourists in coastal areas have further increased the region’s vulnerability.

Simulated tsunami exercises have been organized previously in the Pacific in 2008 and in the Indian Ocean in 2009. The Intergovernmental Coordination Group of the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS) was established in 2005, replicating the model of the Pacific, Indian Ocean and Northeast Atlantic systems. Created under the banner of the IOC, the ICGs support Member States in implementing Tsunami Early Warning Systems.

*Aruba, Antigua and Barbuda, Bahamas, Barbados, Belize, Bolivarian Republic of Venezuela, Brazil, Canada, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, France (Martinique, Guadeloupe, St Martin, Guyane), Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Netherlands (Bonaire, Saba, Sint Eustatius, Curacao and Sint Marteen), Nicaragua, Panama, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sri Lanka, Suriname, Trinidad and Tobago, United Kingdom (Anguilla, British Virgin Islands, Bermuda, Cayman Islands, Montserrat, Turks and Caicos), United States

**Intergovernmental Coordination Group for Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, the Caribbean Emergency Management Agency, the Centro de Coordinación para la Prevención de los Desastres Naturales en América Central, NOAA, and the U.S. National Tsunami Hazard Mitigation Program (NTHMP) are providing the framework for this exercise.

Contact: Agnès Bardon, UNESCO Division of Public Information
Tel :+33 (0) 1 45 68 17 64/a.bardon@unesco.org
More information: http://www.unesco.org/new/en/natural-sciences/ioc-oceans/high-level-objectives/marine-hazards/

http://www.news.gov.tt/index.php?news=7388

UNITED STATES OF AMERICA

PUERTO RICO

Primera hora:

Compañías de celulares no participan de ejercicio de tsunami

miércoles, 23 de marzo de 2011 09:46 a.m. Primera Hora

Las compañías de celulares AT&T, Claro y T-Mobile no participaron del simulacro de tsunami, como había anticipado el gobierno, enviando mensajes de texto SMS.

El director de la Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (AEMEAD), Heriberto Saurí, antes del ejercicio dijo que a las 9:02 a.m se sabría si en efecto se unirían o no el aviso.

AT&T había anticipado que no participaría y Saurí mencionó que la compañía estaba sujeta a la Junta Reglamentadora de Telecomunicaciones.

En AEMEAD, mientras tanto, no se le permitió a la prensa cubrir el proceso de recibo de información sobre el ejercicio de maremoto y tsunami que se lleva a cabo en el Centro de Operaciones de Emergencia.

Solo se le permitió a los fotoperiodistas tomar fotos y vídeo brevemente.

http://www.primerahora.com/companiasdecelularesnoparticipandeejerciciodetsunami-486390.html

Simulacro de tsunami

Unas 17 agencia de gobierno participaron del simulacro, junto a 34 escuelas. (Primera Hora / Vanessa Colón)

miércoles, 23 de marzo de 2011 Actualizado hace 10 minutos (creado 08:49 a.m.) Maritza Díaz Alcaide / Primera Hora

Todo listo para el inicio en breve del simulacro de terremoto y tsunami denominado "Caribe Wave Lantex 2011".

El director de la Agencia Estatal para el Menejo de Emergencias, Heriberto Saurí, dijo esta mañana en la sede que la alerta del "desastre" se transmitiría por radio y televisión, a través del sistema EAS y por mensajes SMS de todas las compañías de teléfono.

El mensaje vía celular es la primera vez que se utiliza. El alerta será justo a las 9:02 de la mañana.

Indicó que 30 municipios participan del simulacro.

Están activadas para atender "la emergencia" 17 agencias de gobierno, entre ellas 34 escuelas.

A esta fecha Puerto Rico cuenta con sólo 11 pueblos listos para enfrentar un tsunami.

Estos son Dorado, Manatí, Aguada, Rincón, Lajas, Ponce, Carolina, Añasco, Mayagüez, Cabo Rojo y Aguadilla.

http://www.primerahora.com/simulacrodetsunami-486377.html

Noticias

23 Marzo 2011

10:12 a.m.

Desalojan escuelas y oficinas

Como parte del simulacro de terremoto y tsunami

Diversas agencias gubernamentales y municipios iniciaron esta mañana un simulacro de terremoto que incluye un alerta de tsunami para Puerto Rico, en un adiestramiento denominado "Caribe Wave Lantex 2011".

El director ejecutivo de la Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (Aemead), Heriberto Saurí, explicó que el objetivo del simulacro es probar la efectividad del sistema de alerta (EAS) ante una emergencia de esta naturaleza.

El ejercicio, debe concluir a la 1:30 de la tarde, recrea un terremoto de magnitud 7.6 en la escala de Richter, que generará un tsunami destructivo ubicado a 40 kilómetros al noreste de Fajardo.

Una hora después, Saurí ofrecerá una conferencia de prensa para ofrecer los resultados del simulacro.

Sigue el minuto a minuto:

10:07 a.m. – "También hay que pintar bien los reductores de velocidad que hay en la zona, porque el único incidente que tuvimos en la ruta fue el de una maestra que se tropezó con un reductor y se cayó. Tuvo que ser atendida por Emergencias Médicas", sostuvo el Alcalde de Toa Baja.

10:04 a.m. “También tuvimos problemas con la soga que usan los niños pequeños”, dijo Vega Borges.

10:01 a.m. – “Encontramos algunas cosas que hay que mejorar también, como por ejemplo, un portón por donde salieron los estudiantes de la Espíritu Santo, que es muy estrecho”, añadió el Alcalde de Toa Baja.

9:58 a.m. – “Definitivamente se necesita mejorar el tiempo de llegar hasta el lugar designado. Según la Defensa Civil, el desalojo se hizo bien. Lo que hay que mejorar es desde las salidas de la escuela hasta el punto seguro de encuentro”, dijo Vega Borges.

9:49 a.m. – En estos municipios hay escuelas, compañías privadas y oficinas gubernamentales que están participando del ejercicio. Casi todos están realizando desalojos.

9:47 a.m. - Melina Simeonides, jefa de prensa de la Aemead, detalla que en el simulacro están participando los siguientes municipios: Dorado, Cataño, Toa Baja, Guaynabo, San Juan, Arecibo, Barceloneta, Camuy, Hatillo, Manatí, Vega Baja, Vega Alta, Lajas, Cabo Rojo, Mayagüez, Guánica, Guayanilla, Juana Díaz, Ponce, Yauco, Yabucoa, Maunabo y Naguabo, entre otros.

9:41 a.m. - Vecinos de la avenida Magdalena, en Condado, se quejan de fallas en las alarmas de tsunami. Los equipos nunca emitieron la alerta.

9:27 a.m.– Ramos indica que en caso de terremoto lo primero que se va a perder son las comunicaciones, tanto por celular como por internet.

9:25 a.m. – "Las personas tienen que tomar conciencia símica y reconocer que Puerto Rico es un área bien activa en términos de terremotos", dice Ramos.

9:24 a.m. – "Si el alerta fuera real, en estos instantes la gente debería estar protegiendo su vida. Agacharse, cubrirse y sujetarse. No salir corriendo de los edificios y buscar un lugar seguro para proteger su vida", dijo Wilfredo Ramos, enlace de la Aemead con la Red Sísmica, a la emisora Radio Isla 1320.

9:22 a.m. – La emisora Radio Isla 1320 reporta que las compañías de teléfonos celulares no cumplieron con el envío de la alerta de terremoto y tsunami.

9:21 - Llegaron a ese lugar a las 9:17 a.m. Se tardaron unos 15 minutos en el trayecto, dijo Vega Broges, que se mantuvo liderando el simulacro todo el tiempo.

9:20 - Al llegar a la esquina de la avenida Boulevard doblaron a la izquierda para llegar a la escuela Pedro Albizu Campos, la cual está localizada al lado del tanque de agua, que es visible desde gran distancia.

9:19 a.m. - Más de 1,000 estudiantes recorren el Paseo Dorcas para llegar hasta la intersección con la avenida Boulevard, la cual fue cerrada al tráfico vehicular.

9:18 a.m. – También se les unen los alumnos de la escuela John F. Kennedy.

9:17 a.m. – En esa zona se les unen estudiantes de la Academia Discípulos de Cristo, cerca del estadio de pequeñas ligas Manuel Ralat Avilés

9:14 a.m. – Los estudiantes se agruparon en la cancha y luego salen para unas oficinas aledañas al plantel

9:13 a.m. – Vega Borges exhorta a los alumnos a caminar poco a poco, porque en caso de un evento real podría haber escombros en el suelo.

9:12 a.m. – El alcalde de Toa Baja, Aníbal Vega Borges, está en la escuela, liderando el movimiento de los estudiantes hacia la cancha.

9:11 a.m. –La maestra le anuncia a los estudiantes y maestros que hay que moverse a la cancha.

9:10 a.m. – Una maestra designada con anticipación pasó por los salones del Colegio Espíritu Santo, con un megáfono, avisando del simulacro de terremoto y tsunami.

9:09 a.m. – Los estudiantes se movieron debajo de los pupitres por 20 segundos.

9:08 a.m. – A las 9:00 a.m. inició el simulacro en esa escuela con el sonido de las sirenas.

9:07 a.m. – Los estudiantes del Colegio Espíritu Santo en Toa Baja participan en el simulacro de terremoto y tsunami. Este plantel tiene una matrícula de 700 estudiantes.

9:06 a.m. – "Esto concluye el ejercicio de prueba", dice la emisora, que regresó a su programación regular. **Se escuchan sirenas de vehículos de emergencia en las carreteras.**

9:05 a.m. – La emisora indica que de haber sido una situación real, se hubieran impartido instrucciones una vez dejaran de sonar las alarmas.

9:04 a.m. – WKAQ 580 reporta que sólo se trata de un ejercicio.

9:03 a.m. – Suenan las alarmas de emergencia en las emisoras radiales del País.

http://www.elnuevodia.com/desalojanescuelasyoficinas-921603.html

23 Marzo 2011

12:13 p.m.

Satisfactorio el simulacro de terremoto y tsunami según el Gobierno

Critican que no todas las compañías de celulares participaron en el ejercicio

Por Inter News Service

El director ejecutivo de la Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (AEMEAD), Heriberto Saurí, calificó de satisfactorio el ejercicio de terremoto que

incluyó una alerta de tsunami para Puerto Rico e Islas Vírgenes, en un adiestramiento denominado "Caribe Wave Lantex 2011".

Aunque al simulacro no se unieron las compañías de teléfono móvil, como habían acordado, Saurí en principio lo consideró como exitoso.

El Director Ejecutivo de la AEMEAD se lamentó de que las empresas de telefonía no aprovecharan esta oportunidad para probar su sistema.

Saurí también criticó que en ocasiones se reciban mensajes que no tienen sentido por los teléfonos y sin embargo no aprovecharan el ejercicio.

Comentó que dependerá que los ciudadanos le exijan a esas empresas y que pasen juicio de lo ocurrido.

También declaró que la Junta Reglamentadora de Comunicaciones, y su presidenta Sandra Torres, tendrán que investigar la situación.

Aunque la señal se transmitió poco después de las 9:02 a.m. en algunas estaciones de televisión, el funcionario se mostró satisfecho con el ejercicio que culminará después de la 1:00 p.m.

Saurí explicó que hubo alrededor de 10,000 desalojos de personas en distintos lugares e instancias en un tiempo corto.

Dijo que al simulacro se unieron en San Pedro de Macorís (este de República Dominicana) y en las Islas Vírgenes estadounidenses.

Saurí informó que a las 2:30 p.m. ofrecerá una conferencia de prensa para ofrecer detalles de la evaluación que harán del ejercicio.

En la conferencia participarán Christa Von Hilldebrant, directora del Programa de Tsunami del Caribe; Víctor Huérfano, director de la Red Sísmica; Israel Matos y Rafael Mojica, director y subdirector del Servicio Nacional de Meteorología de Estados Unidos en Puerto Rico, y Alfonso Giménez, presidente del Comité de Emergencias de la Asociación de Radiodifusores.

http://www.elnuevodia.com/satisfactorioelsimulacrodeterremotoytsunamisegunelgobierno-921795.html

Noticias

24 Marzo 2011

08:27 a.m.

Senado podría obligar a los municipios a prepararse para un tsunami

Mariíta Santiago radica medida

La senadora María "Mariíta" Santiago informó que presentó una medida que obligaría a los municipios costeros del país a adoptar el programa "Tsunami Ready", al que tendrán que certificarse.

Santiago indicó que el Programa “Tsunami Ready” es uno de reconocimiento del Servicio Nacional de Meteorología que promueve la preparación ante el riesgo de un fenómeno de esa naturaleza.

“Este programa es parte de Storm Ready, y el mismo es un esfuerzo colaborativo que envuelve a los funcionarios de Manejo de Emergencias a nivel federal, estatal, local y a la ciudadanía en general”, explicó la también Presidenta de la Comisión de Recursos Naturales y Ambientales del Senado.

Santiago consideró prioritario que todos los municipios de las costas de Puerto Rico adopten y se certifiquen en el Programa Tsunami Ready, ya que sólo 11 de los 44 pueblos costeros que están en la zona de peligro tienen actualmente un plan de acción para enfrentar un evento de ese tipo.

http://www.elnuevodia.com/senadopodriaobligaralosmunicipiosaprepararseparauntsunami-922503.html

Noticias

24 Marzo 2011
06:02 a.m.

Emisoras de televisión dieron el alerta de tsunami

Pero casi todas las compañías que ofrecen servicio celular fallaron en el cometido de avisarle a sus clientes sobre la alerta a través de mensaje de texto

La presidenta de la Junta Reglamentadora de Telecomunicaciones (JRT), Sandra Torres, explicó ayer que tras el simulacro realizado por el Gobierno, el 100% de las compañías de televisión por cable y satélite pudieron cumplir con la transmisión de alerta de tsunami

Sin embargo, este no fue el caso de las compañías que ofrecen servicio celular en la Isla, ya que a juicio de la JRT fallaron en el cometido de avisarle a sus clientes sobre la alerta a través de mensaje de texto o SMS.

Según Torres, sólo T-Mobile pudo enviar entre 20,000 a 30,000 mensajes de texto. Estos sirvieron para alertar a una muestra reducida de clientes identificados como residentes de las áreas costeras de mayor riesgo en caso de ocurrir un tsunami.

El resto de las proveedoras como Open Mobile, Claro y Sprint no pudo cumplir con las expectativas. A pesar de que cada una por su cuenta hubiera aceptado participar del simulacro y enviar los mensajes. AT&T fue la única que declinó participar del simulacro.

José Juan Dávila, gerente general de la proveedora en Puerto Rico, manifestó que aunque "aplaude" la buena intención del gobierno de alertar a la población, reconoce que el sistema de SMS tiene sus limitaciones y no se considera efectivo para usarse en caso de emergencia.

Dávila indicó que actualmente en Estados Unidos se trabaja en el desarrollo de una iniciativa entre el gobierno federal y las principales proveedoras para enviar SMS en bloque o a través de boadcasting en caso de una emergencia, sin que las líneas se sobrecarguen o se afecte la comunicación.

El innovador sistema se conoce como Commercial Mobile Alert System (CMAS) y se espera esté disponible a partir del segundo trimestre del 2012.

Torres se manifestó preocupada por lo ocurrido hoy e indicó que estará convocando a una reunión para el próximo viernes con todas las compañías de celulares para encontrar la mejor manera para lograr una comunicación masiva e instantánea con los clientes.

"En esta ocasión nos informaron que hubo ataponamiento en las líneas y muchos mensajes no llegaron. Claro está, esto es un simulacro, que nos ayuda a ensayar en caso de que ocurra una emergencia real en un futuro", sostuvo la Presidenta de la JRT.

http://www.elnuevodia.com/emisorasdetelevisiondieronelalertadetsunami-922021.html

Noticias

25 Marzo 2011

06:08 a.m.

Intentan fortalecer las alertas de tsunamis

Tras tardanza detectada en el simulacro

La tardanza en el despacho del mensaje de alerta de tsunami durante el simulacro de antier evidencia la falta de un equipo esencial para detectar a tiempo este tipo de fenómeno natural y evitar la pérdida de vida y propiedad, dijo ayer el senador Carmelo Ríos Santiago.

"Ayer se tardaron dos minutos en que se transmitiera la señal. De aquí de Puerto Rico fue a Alaska (al Centro de Alerta de Tsunami) y regreso, esos dos minutos pueden significar miles de vida que podemos salvarlas si tuvieramos ese sistema aquí", señaló el legislador. Ríos, junto a la senadora Itzamar Peña, presentaron ayer el Proyecto del Senado 1916 que busca fortalecer las alertas de tsunamis de la Red Sísmica de Puerto Rico, estableciendo un Programa y Sistema de Alerta y Mitigación de Maremotos en Puerto Rico, un acuerdo de cooperación y fondo especial para Servicios de este centro sismológico y establecer su financiamiento. La aportación estatal para este proyecto sobrepasaría los $5 millones.

Esta medida viabilizaría la creación de un sistema de estaciones sísmicas y boyas con tecnología de monitoreo remoto en tiempo real el cual alertará prontamente en caso de amenaza de un tsunami.

La Isla cuenta con la infraestructura de la Red Sísmica en la Universidad de Puerto Rico de Mayaguez (UPRM) y profesionales preparados para el estudio y monitoreo de estos fenómenos naturales. Sin embargo, no cuenta con la tecnología y personal necesario para poder prevenir eventos catastróficos producto de un maremoto, indicó el senador.

Aparte de las boyas, la medida senatorial permitiría el establecimiento de una red de estaciones en tierra y mar para detectar estos fenónemos en tiempo real y alertar inmediatamente a los sistemas de emergencia del gobierno.

El sistema también ofrecería la oportunidad de poder realizar estudios científicos sobre la actividad sísmica y las dinámicas de las corrientes, mareas y parámetros físicos y químicos de nuestros mares y de factores climáticos asociados. "Puerto Rico, por su localización geológica y greográfica tiene una alta posibilidad de sufrir terremotos y posiblemente tsunamis, ante este panorama no podemos esperar que ocurra un catástrofe para implementar este sistema en el mar que nos alerte con tiempo" dijo Ríos.

http://www.elnuevodia.com/intentanfortalecerlasalertasdetsunamis-922856.html

Noticias

23 Marzo 2011

03:32 p.m.

Explican que las sirenas de alerta en San Juan no sonaron porque no existen

La Aemead dijo que están satisfechos con la respuesta de las agencias, municipios, escuelas y compañías privadas que participaron en el simulacro de terremoto y tsunami. ***Mira las fotos, el vídeo y lee el minuto a minuto***

El simulacro de terremoto de hoy que incluyó un alerta de tsunami para Puerto Rico denominado "Caribe Wave Lantex 2011" fue calificado como exitoso por Heriberto Saurí, director ejecutivo de la Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (Aemead).

Saurí explicó que el objetivo del simulacro era probar la efectividad del Sistema de Alerta de Emergencia (EAS, por su sigla en inglés) ante una urgencia de esta naturaleza.

El ejercicio, que concluyó a la 1:30 p.m., recreó un terremoto de magnitud 7.6 en la escala de Richter, que generó un tsunami destructivo ubicado a 40 kilómetros al noreste de Fajardo.

Saurí explicó que en San Juan no se escucharon sirenas de alerta porque no hay sirenas en toda la zona.

Indicó que recientemente se adjudicó una subasta para ubicar de 18 a 24 sirenas en el litoral costero entre Toa Baja y San Juan.

Lee el minuto a minuto:

3:07 p.m. – Von Hillebrandt señala que actualmente se depende del centro de alerta de tsunami que está en Alaska, pero con un centro en Puerto Rico se pueden ahorrar unos tres minutos en el aviso.

3:04 p.m. – Christa Von Hillebrandt, de la NOAA, señala que establecer un centro de alerta de tsunamis en Puerto Rico será beneficioso para todo el Caribe dado que acelerará el aviso en caso de ocurrir un tsunami.

3:01 p.m. – En los municipios de Carolina y Cataño se activaron las sirenas de los vehículos municipales para avisar del simulacro.

2:58 p.m. – Indicó que recientemente se adjudicó una subasta para ubicar de 18 a 24 sirenas en el litoral costero entre Toa Baja y San Juan.

2:55 p.m. – El funcionario explicó que en San Juan no se escucharon sirenas de alerta porque no hay sirenas en toda la zona.

2:52 p.m. – Además de las compañías de celulares que no enviaron el alerta, Saurí dijo que una de las tres sirenas que tiene el Municipio de Mayagüez sólo emitió el mensaje de alerta por voz, razón por la cual vecinos de esa ciudad se quejaron de que no escucharon el mensaje.

2:49 p.m. – El gobernador interino y secretario de Justicia, Guillermo Somoza, dijo que la opción de las compañías celulares de enviar mensajes de texto dando el alerta de terremoto y aviso de tsunami era algo voluntario y que para solucionarlo se está trabajando en un proyeto de ley (el PC3261) para que dicha opción sea obligatoria.

2:46 p.m. – "La efectividad del EAS a través de los medios de comunicación se probó con un 99.9%", dijo Saurí, en referencia de que sólo dos o tres de las más de 150 emisoras radiales y televisivas en la Isla tuvieron problemas técnicos para difundir el alerta.

2:44 p.m. – Estos desalojos se hicieron en no más de ocho minutos desde que se activó el sistema de alerta de emergencias (EAS, por su sigla en inglés).

2:42 p.m. – El Director Ejecutivo de la AEMEAD indicó que se hicieron 160 desalojos en los que se movilizaron más de 15,000 personas.

2:39 p.m. – Saurí indicó que los participantes validaron sus planes de emergencia a través de actividades como desalojos, adiestramientos y ejercicios de mesa.

2:37 p.m. – Saurí se mostró satisfecho con la respuesta de las agencias, municipios, escuelas y compañías privadas que participaron en el simulacro.

2:35 p.m. – Inicia la conferencia de prensa de la Aemead para hablar de los resultados del simulacro de terremoto y tsunami.

11:31 a.m. – Los equipos nunca emitieron la alerta, dijeron residentes de la avenida Magdalena.

11:29 a.m. – Poco después de iniciar el simulacro de terremoto y alerta de tsunami, vecinos de la avenida Magdalena en Condado se quejaron de fallas en las alarmas de tsunami.

11:23 a.m. – "Las sonaron (las alarmas), pero eran muy tenues. Entiendo que deben instalar más", dijo a El Nuevo Día un vecino de Mayagüez.

11:21 a.m. – Residentes de Mayagüez señalan que casi no se escuchaban las sirenas dando el alerta de tsunami en esa ciudad.

10:53 a.m. – Eventualmente, T-Mobile lo hará a toda su base de clientes como parte del ejercicio de preparación para una eventual emergencia.

10:51 a.m. – En el caso de T-Mobile, esta proveedora indicó que envió mensajes de texto en un periodo inicial sólo a su base de clientes con residencia en las zonas de mayor riesgo de tsunami, según ha determinado la Agencia del Sistema de Manejo de Emergencia.

10:47 a.m. – Por otra parte, tanto T-Mobile como Open Mobile confirmaron a El Nuevo Día que cumplieron con la orden de la JRT y enviaron los mensajes de alerta de tsunami como parte del simulacro que se realizó hoy.

10:42 a.m. – Las expresiones de Torres, hechas a través de una emisora de radio local, mostraron su preocupación ante la anunciada fusión de AT&T y T-Mobile, ya que podría tener un efecto adverso para los clientes de ambas compañías.

10:39 a.m. – Según la portavoz de la agencia, la principal proveedora celular en la Isla no cuenta con la capacidad suficiente para emitir un aviso simultáneo a toda su matrícula de clientes que según indicó asciende a sobre 500,000 consumidores.

10:36 a.m. – La presidenta de la Junta Reglamentadora de Telecomunicaciones (JRT), Sandra Torres, hizo hoy severas críticas contra la compañía de comunicaciones AT&T por negarse a participar del simulacro de tsunami que se realizó esta mañana, enviando mensajes de texto a sus suscriptores.

10:27 a.m. – Camacho dijo que una cosa que notó era que había mucha presencia policiaca y del Municipio de Toa Baja, cuando en una emergencia real, ninguno de esos funcioanrios va a estar ahí.

10:24 a.m. – "Este ejercicio era para probar los sistemas de comunicación. Nada tenía que ver con un terremoto o tsunami, y durante el transcurso pareció una excursion en vez de un simulacro, lo que podría confundir a los estudiantes", añadió Camacho.

10:22 a.m. – Por su parte, otro portavoz de la organización, Juan Camacho, sostuvo que el grupo que se conoce como Comité de Toabajeños Organizados Contra el Gasoducto respaldaba "éste y cada esfuerzo que se haga por mejorar la seguridad de nuestros vecinos, pero hay que tener algo de cuidado".

10:20 a.m. – "Aquí hay colegios, escuelas y centros de envejecientes, y de ocurrir un verdadero terremoto o tsunami, no tendríamos para donde escapar", dijo Lozada.

10:18 a.m. – Justo Lozada fue uno de los portaceas del grupo. Dijo que estaban "denunciando este intento de simulacro de tsunami, cuando lo que deberían realmente hacer es evitar el peligro inminente que representaría una tubería de 24 pulgadas con gas extremadamente inflamable que pase por esta zona".

10:16 a.m. – Los manifestantes tenían pancartas en mano y expresaron su reclamo a los que pasan por la carretera PR-165.

10:14 a.m. – Un grupo de toabajeños se congregó en la entrada del Colegio Espíritu Santo para expresar su oposición al gasoducto.

10:10 a.m. – El simulacro de terremoto y alerta de tsunami en el Municipio de Toa Baja concluyó.

10:07 a.m. – "También hay que pintar bien los reductores de velocidad que hay en la zona, porque el único incidente que tuvimos en la ruta fue el de una maestra que se tropezó con un reductor y se cayó. Tuvo que ser atendida por Emergencias Médicas", sostuvo el Alcalde de Toa Baja.

10:04 a.m. – “También tuvimos problemas con la soga que usan los niños pequeños”, dijo Vega Borges.

10:01 a.m. – “Encontramos algunas cosas que hay que mejorar también, como por ejemplo, un portón por donde salieron los estudiantes de la Espíritu Santo, que es muy estrecho”, añadió el Alcalde de Toa Baja.

9:58 a.m. – “Definitivamente se necesita mejorar el tiempo de llegar hasta el lugar designado. Según la Defensa Civil, el desalojo se hizo bien. Lo que hay que mejorar es desde las salidas de la escuela hasta el punto seguro de encuentro”, dijo Vega Borges.

9:49 a.m – En estos municipios hay escuelas, compañías privadas y oficinas gubernamentales que están participando del ejercicio. Casi todos están realizando desalojos.

9:47 a.m. – Melina Simeonides, jefa de prensa de la Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (Aemead),detalla que en el simulacro están participando los siguientes municipios: Dorado, Cataño, Toa Baja, Guaynabo, San Juan, Arecibo, Barceloneta, Camuy, Hatillo, Manatí, Vega Baja, Vega Alta, Lajas, Cabo Rojo, Mayagüez, Guánica, Guayanilla, Juana Díaz, Ponce, Yauco, Yabucoa, Maunabo y Naguabo, entre otros.

9:41 a.m. – Vecinos de la avenida Magdalena, en Condado, se quejan de fallas en las alarmas de tsunami. Los equipos nunca emitieron la alerta.

9:27 a.m. – Ramos indica que en caso de terremoto lo primero que se va a perder son las comunicaciones, tanto por celular como por internet.

9:25 a.m –."Las personas tienen que tomar conciencia símica y reconocer que Puerto Rico es un área bien activa en términos de terremotos", dice Ramos.

9:24 a.m. – "Si el alerta fuera real, en estos instantes la gente debería estar protegiendo su vida. Agacharse, cubrirse y sujetarse. No salir corriendo de los edificios y buscar un lugar seguro para proteger su vida", dijo Wilfredo Ramos, enlace de la Aemead con la Red Sísmica, a la emisora Radio Isla 1320.

9:22 a.m. – La emisora Radio Isla 1320 reporta que las compañías de teléfonos celulares no cumplieron con el envío de la alerta de terremoto y tsunami.

9:21 a.m. – Llegaron a ese lugar a las 9:17 a.m. Se tardaron unos 15 minutos en el trayecto, dijo Vega Borges, que se mantuvo liderando el simulacro todo el tiempo.

9:20 a.m. – Al llegar a la esquina de la avenida Boulevard doblaron a la izquierda para llegar a la escuela Pedro Albizu Campos, la cual está localizada al lado del tanque de agua, que es visible desde gran distancia.

9:19 a.m. – más de 1,000 estudiantes recorren el Paseo Dorcas para llegar hasta la intersección con la avenida Boulevard, la cual fue cerrada al tráfico vehicular

9:18 a.m. – También se les unen los alumnos de la escuela John F. Kennedy.

9:17 a.m. – En esa zona se les unen estudiantes de la Academia Discípulos de Cristo, cerca del estadio de pequeñas ligas Manuel Ralat Avilés.

9:14 a.m. – Los estudiantes se agruparon en la cancha y luego salen para unas oficinas aledañas al plantel.

9:13 a.m. – Vega Borges exhorta a los alumnos a caminar poco a poco, porque en caso de un evento real podría haber escombros en el suelo.

9:12 a.m. – El alcalde de Toa Baja, Aníbal Vega Borges, está en la escuela, liderando el movimiento de los estudiantes hacia la cancha.

9:11 a.m. – La maestra le anuncia a los estudiantes y maestros que hay que moverse a la cancha.

9:10 a.m. -Una maestra designada con anticipación pasó por los salones del Colegio Espíritu Santo, con un megáfono, avisando del simulacro de terremoto y tsunami.

9:09 a.m. -Los estudiantes se movieron debajo de los pupitres por 20 segundos.

9:08 a.m. - A las 9:00 a.m.inició el simulacro en esa escuela con el sonido de las sirenas.

9:07 a.m. - Los estudiantes del Colegio Espíritu Santo en Toa Baja participan en el simulacro de terremoto y tsunami. Este plantel tiene una matrícula de 700 estudiantes.

9:06 a.m. - "Esto concluye el ejercicio de prueba", dice la emisora, que regresó a su programación regular. Se escuchan sirenas de vehículos de emergencia en las carreteras.

9:05 a.m. - La emisora indica que de haber sido una situación real, se hubieran impartido instrucciones una vez dejaran de sonar las alarmas.

9:04 a.m. - WKAQ 580 reporta que sólo se trata de un ejercicio.

9:03 a.m. - Suenan las alarmas de emergencia en las emisoras radiales del País.

http://www.elnuevodia.com/explicanquelassirenasdealertaensanjuannosonaronporquenoexisten-921603.html

Noticias
23 Marzo 2011
04:16 p.m.

Asegura estar lista para un tsunami Mayita

La alcaldesa de Ponce aseguró que los ejercicios relacionados con el simulacro de tsunami Lantex 2011 se llevaron a cabo satisfactoriamente en su municipio

La alcaldesa de Ponce, María Meléndez Altieri, aseguró hoy que su municipio está preparado para enfrentar la emergencia de un tsunami. Meléndez Altieri indicó que los ejercicios relacionados con el simulacro de tsunami Lantex 2011 concluyeron favorablemente para el municipio de Ponce.

“Las unidades de respuesta de nuestra ciudad están listas en caso de que tuviéramos que atender una emergencia de gran magnitud como la que representa un terremoto o un tsunami”, sostuvo la alcaldesa.

El simulacro Lantex 2011 se inició a las 9:02 de la mañana con avisos a través del sistema de alerta de emergencias (EAS, en inglés) de las emisoras de radio de Ponce.

El aviso activó de inmediato al personal de la Oficina Municipal para el Manejo de Emergencias (OMME), que se movilizó a la cancha Salvador Dijols, ubicada en La Playa de Ponce.

Meléndez Altieri indicó que hasta esa instalación deportiva, denominada zona de reuniones, llegaron residentes del área y estudiantes de las escuelas públicas y privadas de la zona que se participaron del simulacro, tras activar sus propios planes de emergencia de acuerdo con la información que ofreció el director de OMME en Ponce, Rubén Rivera.

“Si hubiese sido una situación real, las unidades de respuesta hubieran movilizado a las personas a lugares seguros. Evaluamos si pusieron en marcha sus planes de desalojo y, además, como parte del ejercicio, localizamos a una persona desaparecida. Nuestro personal utilizó el equipo tecnológico y todos los recursos con los que cuenta el municipio y estamos satisfechos con los resultados”, dijo el funcionario.

“Ponce cumple con todos los requisitos para responder ante cualquier emergencia y el simulacro nos permitió asegurarnos que estamos listos para ofrecer un servicio más completo a la ciudadanía. Estos esfuerzos se dirigen a salvar la vida, minimizar los daños y reafirman nuestro compromiso de proveer seguridad a nuestra gente”, agregó Rivera.

http://www.elnuevodia.com/aseguraestarlistaparauntsunamimayita-921919.html

Noticias

23 Marzo 2011

02:06 p.m.

Puerto Rico se ahoga esperando el alerta

Usuarios catalogan como un fracaso el simulacro que se llevó a cabo en la mañana de hoy

F" de Fracaso.

Esa fue la evaluación más repetida en medio de la ola de reacciones en las redes sociales a raíz del simulacro de terremoto y tsunami realizado hoy a nivel Isla.

Heriberto Saurí, director ejecutivo de la Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (Aemead), sostuvo que el propósito del simulacro llamado "Caribe Wave Lantex 2011" era evaluar la efectividad del sistema de alerta (EAS).

Finalizado el simulacro Saurí calificó la simulación como una "satisfactoria". Pero, **¿Qué opina la ciudadanía que se encuentra alrededor de la Isla?**

"*El simulacro fue un desastre total", expresó Magaly Ruiz, quien no especificó su procedencia.*

"*Nos ahogamos y estas alarmas no suenan esto fue un porquería...! Se nota que Puerto Rico no está preparado para un tsunami", comentó Jazmin Miranda desde Juana Díaz.*

"*Un fracaso, todavía estoy esperando oir las alarmas Puerto Rico no está preparado para ninguna clase de desastres", indicó Margarita Nieves.*

"*De veras que fueron fracaso. Ni nos enteramos de qué pasó, ya que ni el texto llegó, ni en la radio lo escuchamos... se ahoga una escuela completa y ni se enteran porque razón. Mal, mal, mal. ", expresó Rochen Loren Rodríguez.*

"*Las sirenas no se escucharon, no pasaron los mensajes por los celulares, de esto haber sido una emergencia real la mitad de los ciudadanos nos hubieramos ahogado por falta de dirección. Para algo tan importante como la seguridad de un pueblo están utilizando bocinas baratas que no se escuchan. Al gobierno de Puerto Rico por favor no juegue con la seguridad de su pueblo", opinó Diana Vergel.*

Melina Simeonides, directora de prensa de la Aemead, sostuvo que en el simulacro estaban participando los municipios de Dorado, Cataño, Toa Baja, Guaynabo, San Juan, Arecibo, Barceloneta, Camuy, Hatillo, Manatí, Vega Baja, Vega Alta, Lajas, Cabo Rojo, Mayagüez, Guánica, Guayanilla, Juana Díaz, Ponce, Yauco, Yabucoa, Maunabo y Naguabo, entre otros.

Sin embargo, usuarios que dijeron encontrarse en los respectivos municipios, expresaron que ni siquiera escucharon la alarma de emergencia y que el ambiente estaba como un día normal.

La incertidumbre de la ciudadanía por saber qué sucedería en Puerto Rico si fuera impactado por un terremoto y tsunami, se ha hecho más fuerte con los últimos reportes de sismos de baja intensidad en Puerto Rico. Esta preocupación se ha intensificado con los eventos atmosféricos que han impactado diferentes partes del mundo entre ellos, el más reciente tsunami que golpeó a Japón la semana pasada y que dejó miles de muertos.

http://www.elnuevodia.com/puertoricoseahogaesperandoelalerta-921850.html

Estudiantes responden a simulacro de tsunami
Yamilet Millán Rodriguez, EL VOCERO (marzo 23, 2011)

La Agencia Estatal para el Manejo de Emergencia y Administración de Desastres (AEMEAD) cumplió con su plan preventivo que tenía preparado para hoy realizando un simulacro de tsunami.

Sin mayores contratiempos los estudiantes de las escuelas públicas cercanas a Ocean Park desalojaron sus planteles.

El plan de emergencia consistió en movilizar al estudiantado y personal a los predios de un centro comercial que ubica frente a la Avenida Baldorioty de Castro.

Con el simulacro AEMEAD buscaba evaluar los sistemas de comunicación. En el ejercicio participaron escuelas públicas y privadas, municipios y agencias gubernamentales.

A las 2:30 p.m. el director de AEMEAD,Heriberto Saurí, ofrecerá una conferencia de prensa donde se informará los pormenores del evento.

http://www.vocero.com/noticias-es/estudiantes-responden-a-simulacro-de-tsunami

¿Preparadas las compañías de celulares ante un tsunami?
Ileanexis Vera Rosado, EL VOCERO (marzo 24, 2011)

El simulacro de un tsunami en la Isla parece haber puesto al descubierto que las compañías de celulares en la Isla pudiesen no estar preparadas para emitir un aviso simultáneo de emergencia a toda su matrícula de clientes, según revelara en expresiones públicas la presidenta de la Junta Reglamentadora de Telecomunicaciones, Sandra Torres.

Torres realizó fuertes críticas, principalmente contra AT&T, por negarse a participar del simulacro, acción que afirmó denota no tener la capacidad para actuar ante una eventualidad como ésta. La ejecutiva aceptó que la agencia no tiene potestad en ley para legislar a favor de que se les obligue a participar sino que es una acción voluntaria. No obstante, aclaró que si existe el mecanismo en ley para tomar la agencia alguna acción de amonestación o penalidad no la descartaría.

La ejecutiva enfatizó que esta acción igualmente incrementa el temor en la Isla ante la propuesta fusión entre AT&T y T-Mobile, asegurando a esta fecha no han podido culminar con el proceso de emigración de los clientes de Centennial, lo que a generado innumerables querellas en la agencia. Adelantó que una vez AT&T radique ante la FCC su intención de compra, manifestará su oposición a la misma.

Por su parte, José Juan Dávila, vicepresidente y gerente general de AT&T Mobility, Inc. en Puerto Rico, explicó que desde el pasado miércoles, AT&T ha participado en diversas reuniones lideradas por el Gobierno relacionadas al simulacro de tsunami. Según se fue desarrollando el proceso,“llegamos a la conclusión de que la mensajería de texto común no sería una solución inalámbrica aceptable para la transmisión de alertas de emergencia. El servicio de mensajes cortos común (SMS) nunca fue concebido ni es efectivo para ser utilizado para difusiones en masa simultáneas en tiempo real. SMS fue diseñado solamente para comunicaciones casuales entre clientes. Además, el tratar de utilizar el sistema de SMS de hoy día para transmisiones simultáneas en situaciones de emergencia no sería exitoso. Con una gran cantidad de consumidores tratando de comunicarse simultáneamente, existe un potencial problema de mensajes retrasados, pérdida de control sobre mensajes n o intencionados y mensajes que no se puedan enviar”.

Agregó, que “conscientes de estas limitaciones, enfocados en proteger a nuestros clientes y no querer crear un sentido falso de seguridad y dependencia de los sistemas SMS durante alertas de emergencias, AT&T optó por no transmitir un mensaje de texto simultáneo para este simulacro. Una vez se tomó esta decisión, AT&T la comunicó a la Junta y a los oficiales de Gobierno involucrados”.

Mientras tanto, T-Mobile, se unió a los esfuerzos de comunicación durante el Simulacro Nacional de Tsunami. Frances J. Rodríguez, gerente de Comunicaciones de T-Mobile, indicó que: “en T-Mobile estamos comprometidos con nuestros clientes, por esto contamos con un plan de emergencia y estamos siempre trabajando para garantizar la seguridad de nuestros clientes, empleados y la calidad de los servicios que ofrecemos. Nos aseguramos de participar en este ejercicio de simulacro y reafirmamos que siempre estamos en la mejor disposición para colaborar con la Junta Reglamentadora y las entidades gubernamentales, más aún si involucra la seguridad de nuestros clientes”.

http://www.vocero.com/negocios-es/%C2%BFpreparadas-las-companias-de-celulares-ante-un-tsunami

Escasa la participación de compañías de celulares en simulacro

El simulacro se llevó a cabo por diferentes agencias científicas y gubernamentales en las zonas inundables en caso de que ocurriera un tsunami. (Olimpo Ramos / Primera Hora)

Miércoles, 23 de marzo de 2011 Actualizado hace 1 días (creado 09:46 a.m.) Primera Hora

Las compañías de celulares AT&T, Claro y T-Mobile no participaron del simulacro de tsunami, como había anticipado el gobierno, enviando mensajes de texto SMS.

El director de la Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (AEMEAD), Heriberto Saurí, antes del ejercicio dijo que a las 9:02 a.m se sabría si en efecto se unirían o no el aviso.

AT&T había anticipado que no participaría y Saurí mencionó que la compañía estaba sujeta a la Junta Reglamentadora de Telecomunicaciones.

En AEMEAD, mientras tanto, no se le permitió a la prensa cubrir el proceso de recibo de información sobre el ejercicio de maremoto y tsunami que se lleva a cabo en el Centro de Operaciones de Emergencia.

Solo se le permitió a los fotoperiodistas tomar fotos y vídeo brevemente.

AT&T no participa del simulacro

La compañía de celulares AT&T no participó del simulacro de tsunami, tal y como se había anticipado. El director de la Agencia para el Manejo de Emergencias y Desastres (AEMEAD), Heriberto Sauri, antes del ejercicio, dijo que a las 9:02 a.m se sabría si en efecto se unirían o no al aviso.

No obstante, a pesar de que las demás compañías de telefonía celular sí habían confirmado su participación en el evento muchos cibernautas de Primera Hora se han quejado de que no recibieron el aviso oficial que estaban supuestos a recibir por mensaje de texto.

El usuario @iToowz escribió en Twitter “Fallecen todos los clientes de AT&T al no recibir mensaje de texto con aviso de Tsunami”. Mientras, @Dalydiva dijo “No recibi ningun alerta en mi cel...para mí fue un fracaso...”

Sobre la radicación de multas Saurí mencionó que la compañía está sujeta a la Junta Reglamentadora de Telecomunicaciones.

En AEMEAD, mientras tanto, no se le permitió a la prensa cubrir el proceso de recibo de información sobre el ejercicio de terremoto y tsunami que se lleva a cabo en el Centro de Operaciones de Emergencia.

Sólo se le permitió a los fotoperiodistas tomar fotos y vídeo brevemente.

Cruz Roja insta a las compañías celulares a unirse a los simulacros de emergencias

El director de Operaciones y Respuesta a desastre de la Cruz Roja de Puerto Rico, Ángel Jiménez, dijo esta mañana que las compañías de celulares deben unirse a las alertas del terremoto.

Jiménez sostuvo que desconoce qué sucedió hoy con las empresas que no participaron del simulacro, pero sostuvo que cooperar con estas emergencias es una responsabilidad ciudadana.

Las compañías de celulares, añadió, también deben orientar al publico sobre el uso de los celulares en casos de emergencia, como evitar que las líneas se congestionen.

Open Mobile avisó a sus clientes en ejercicios de emergencia

La directora de Comunicaciones de Open Mobile, Wandy Borrero, informó que la compañía de telefonía móvil participó del simulacro convocado por el Gobierno y las agencias de seguridad pública, enviando a sus clientes el mensaje de alerta acordado por la Junta Reglamentadora de Telecomunicaciones.

"Simulacro tsunami. Costa norte y este. Magnitud 7.6 a 25 millas del noreste de Fajardo. Aviso: Debe buscar tierras altas. Esto es un simulacro", leía el mensaje enviado por Open Mobile a sus clientes.

Borrero dijo que la alerta llegó por mensaje de texto a una muestra de 20,000 clientes que fueron seleccionados para el ejercicio. Según explicó, eligieron sólo 20,000 clientes, de los más de 300 mil que tiene la compañía, para evitar que se afectaran otros servicios.

"Hay que tomar en cuenta que esto tiene un impacto de señalización no sólo en Puerto Rico, sino en el resto del mundo, por eso, nosotros normalmente hacemos retransmisiones de un mensjae común pero en grupos. Ese volumen de mensajes simultáneos lo dividimos en grupos de 20,000", expresó la Directora de Comunicaciones de Open Mobile.

Los clientes de esta red de telefonía móvil recibieron el alerta en sus celulares en un periodo aproximado de 15 minutos después de que el Gobierno emitiera la alerta general de emergencia.

http://www.primerahora.com/Xstatic/primerahora/template/content.aspx?se=nota&id=486390

Nos fallaron los móviles en el simulacro

Los estudiantes de la Academia Espíritu Santo, en Toa Baja, salieron del plantel como parte del simulacro de tsunami. (Primera Hora / Teresa Canino Rivera)

Jueves, 24 de marzo de 2011 Maritza Díaz Alcaide / Primera Hora

Frustrada buena parte de la ciudadanía con el simulacro de alerta de terremoto y tsunami porque no les llegó a sus celulares el aviso ni se escucharon sirenas de alerta en la mayoría de los pueblos de la Isla.

El alerta de emergencia EAS, que se emite por radio y televisión regular, sin embargo, fue exitoso, aseguró la Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (Aemead).

El principal chasco del ejercicio resultó ser el telefónico.

Las compañías de celulares que operan en la Isla se habían comprometido a emitir el alerta de terremoto y tsunami a todos sus usuarios en dos reuniones distintas, la última el lunes, pero no cumplieron.

- Simulacro Tsunami

La mayoría de los móviles no enviaron los SMS de “terremoto” y las empresas alegaron que no le pudieron cumplir a la Junta Reglamentadora de las Telecomunicaciones porque carecen de capacidad para enviar textos simultáneos a todos sus usuarios.

“Eso no lo habían dicho cuando se reunieron con nosotros. El martes a las 2:00 de la tarde recibí una llamada de AT&T diciendo que no participaría del simulacro porque no había completado el proceso de transición de los clientes de Centennial”, dijo la presidenta de la JTR, Sandra Torres.

Torres lamentó que T- Mobile esperara hasta ayer para informar que sólo estaría enviando los avisos a entre 25 mil y 30 mil clientes. Finalmente se los remitió a 20 mil.

Claro, mientras tanto, se excusó ayer con la JRT indicando que su red se congestionó y que sólo pudo alertar a otros 20 mil usuarios.

Las compañías de celulares en Puerto Rico suscribieron un acuerdo voluntario con la Junta -bajo los parámetros que dicta la Comisión Federal de Comunicaciones- para aportar equipo telefónico en caso de emergencia y para el envío de los textos de aviso.

El acuerdo vigente data de 2010.

El secretario de Justicia, Guillermo Somoza, actuando ayer como gobernador interino, anticipó que podría legislarse a los efectos de obligar a las compañías de teléfono a cooperar con las emergencias que puedan surgir en la Isla.

A esos fines ya hay un proyecto de ley del representante novoprogresista Jorge Navarro.

“El servicio de mensajes cortos común (SMS) nunca fue concebido ni efectivo para ser utilizado para difusiones en masa simultáneas en tiempo real”, afirmó ayer AT&T de Puerto Rico, una conclusión a la que llegaron, según dijeron, mientras se iba desarrollando el proceso del simulacro.

“Con una gran cantidad de consumidores tratando de comunicarse simultáneamente, existe un potencial problema de mensajes retrasados, pérdida de control sobre mensajes no intencionados y mensajes que no se pueden enviar... Conscientes de estas limitaciones, enfocados en proteger a nuestros clientes y por no querer crear un sentido falso de seguridad y dependencia de los sistemas SMS durante alertas de emergencias, AT&T optó por no transmitir un mensaje de texto simultáneo para el simulacro”, acotó la compañía.

La directora de Comunicaciones de Open Mobile, Wandy Marrero, anunció que esa empresa le envió el aviso de tsunami a una muestra de 20 mil de sus clientes.

“No oí la sirena”, fue lo que se escuchó en el Condado, en San Juan, durante el ejercicio.

Imposible que la escucharan, porque la capital de Puerto Rico no cuenta con ningún sistema de sirenas que advierta sobre los maremotos.

De hecho, ayer de todos modos no se habría podido medir la efectividad de las sirenas, porque casi ningún pueblo las tiene.

El director de la Aemead, Heriberto Saurí, dijo que sólo se han colocado estos sistemas en Mayagüez, Aguadilla, Ponce y Toa Baja.

El dinero para adquirirlas es una aportación federal, entre $24 mil y $28 mil.

El Municipio de San Juan tiene en agenda comprar sus sirenas. El 24 de noviembre se anunció la solicitud de propuestas y la subasta se la llevó Industrial Security Products.

Durante el simulacro de ayer hubo problemas con las sirenas de Mayagüez.

El aviso se escuchó “bajito” porque le falló la programación y el llamado de emergencia fue de voz.

En cuanto a los desalojos, Saurí dijo que más de 15 mil personas participaron de los mismos.

En promedio, tardaron entre siete y ocho minutos, lo que el director de Aemead señaló que “está más que bien”.

El director de la Red Sísmica, Víctor Huérfano, afirmó, sin embargo, que el tsunami de 1918 en la zona oeste tardó siete minutos en afectar la costa más cercana, lo que implica que ciertos fenómenos obligan a correr más rápido hacia lugares seguros.

El EAS se activó en este simulacro en menos de dos minutos.

El mejor alerta de todos, concluyeron Saurí y Huérfano, es el propio terremoto. Si éste es potente, se debe anticipar un tsunami y buscar un lugar alto rápido sin esperar a ningún otra alerta.

http://www.primerahora.com/Xstatic/primerahora/template/content.aspx?se=nota&id=486735

Todo listo para el ejercicio con alerta de tsunami para este miércoles

Lunes, 21 de marzo de 2011

02:13 p.m.

Inter News Service

El ejercicio que incluirá una alerta de tsunami para Puerto Rico, en un adiestramiento denominado "Caribe Wave Lantex 2011" para probar la efectividad del sistema de alerta, ya está preparada en su totalidad.

Heriberto Saurí, director ejecutivo de la Agencia Estatal para el Manejo de Emergencias y Administración de Desastres (AEMEAD), dijo que el adiestramiento se efectuará el miércoles 23.

Saurí exhortó a los ciudadanos a mantenerse informados a través de los medios de comunicación del ejercicio que se llevará a cabo el 23 de marzo en todo el Caribe y que culminará a la 1:30 de la tarde.

Explicó que "este es un ejercicio de alerta de tsunami en el Caribe que comenzará a las 9:00 de la mañana, cuando surge un primer terremoto hipotético. Este ejercicio comprenderá simulaciones de mensajes de aviso y de advertencia de los centros de alerta de tsunami sobre la base de este primer terremoto hipotético de magnitud 7.6 surgido cerca de las Islas Vírgenes de los Estados Unidos. Habrá un segundo temblor hipotético a las 9:05 de la mañana, también de magnitud 7.6".

Los ciudadanos deberán estar alertas a que a las 9:03 de la mañana se activará el sistema de alerta de emergencia (EAS), por lo que escucharán el tono y el mensaje del aviso de tsunami indicando que es sólo una prueba.

Como parte del adiestramiento se activará el código de alerta real (Emergency Alert System EAS).

Las emisoras de radio, televisión y los sistemas de cable de Puerto Rico recibirán y difundirán un mensaje de prueba de Alerta de Tsunami como parte del ejercicio.

http://www.primerahora.com/Xstatic/primerahora/template/content.aspx?se=nota&id=485765

Preocupa lentitud en el simulacro

El alcalde de Toa Baja, Aníbal Vega Borges, utilizó un altoparlante para dirigirse a los estudiantes.(Primera Hora / Teresa Canino Rivera)

jueves, 24 de marzo de 2011

Sara M. Justicia / Primera Hora

A las 9:00 de la mañana en punto sonó la primera alarma. Esta sirena inicial alertó sobre un sismo. A las 9:02 en punto sonó la segunda señal, que instruyó a que los estudiantes de la Academia Espíritu Santo, en Toa Baja, salieran del plantel porque se aproximaba un tsunami. Acto seguido, salieron de los salones y se dirigieron a una zona más alta en su pueblo.

Hicieron lo mismo otras escuelas, égidas, Head Start y toabajeños que formaron parte del ejercicio Caribe Wave Lantex 2011, dirigido a probar la efectividad del sistema de alerta en caso de tsunami.

Con un altoparlante en mano, el alcalde de Toa Baja, Aníbal Vega Borges, se dirigió a los estudiantes. Pero, desde el principio, el Alcalde notó errores en el ejercicio.

“Más rápido, más rápido. Están muy lentos. Una maestra me dijo que la soga para los nenes chiquitos los atrasa”, dijo Vega Borges. En el camino, una maestra se cayó al tropezarse con un badén en la carretera. También, dos patrullas de la Policía se abrieron paso entre los estudiantes y por poco pisan a algunos de los niños. Un portón por el que tenían que atravesar los participantes resultó muy estrecho, por lo que también retrasó el proceso de evacuación desde el plantel de la escuela.

A las 9:15 de la mañana, los participantes llegaron al estacionamiento de la Biblioteca Municipal. En el caso de un tsunami real, se treparían a la azotea, pues sería el punto más alto, pero el edificio está en construcción.

Vega Borges se mostró sumamente preocupado por el riesgo que un tsunami representaría para más de 40 mil habitantes de su pueblo, incluyendo a los residentes de las distintas secciones de Levittown.

“En el caso de un tsunami, la carretera PR-165 se vuelve inoperante. Las vías de salida serían la Boulevard hacia la PR-167. Tenemos también la situación de que hay muchos caños y ríos que, cuando entre la ola, también van a generar más agua y eso complica las cosas”, dijo Vega Borges.

El Alcalde exhortó a los ciudadanos de su pueblo a tener un plan de desalojo familiar para tsunamis.

“En nuestro pueblo, el tres por ciento de las personas, yo diría, están informados y conscientes”, agregó.

Vega Borges advirtió que se teme que mucha gente no quiera desalojar sus residencias y abandonar sus propiedades en el caso de que las autoridades la tengan que obligar, como sucede en los huracanes o inundaciones. Comerciantes del área se mostraron incrédulos y sostuvieron que falta mucho por hacer para estar verdaderamente preparados.

http://www.primerahora.com/Xstatic/primerahora/template/content.aspx?se=nota&id=486737

T-Mobile sí envió alerta de tsunami

miércoles, 23 de marzo de 2011

01:26 p.m. Primera Hora

La compañía de celulares, T-Mobile, emitió un comunicado temprano en la tarde para aclarar que sí participó del simulacro de tsunami que se realizó hoy en Puerto Rico.

La empresa implementó un plan en conjunto con la Junta Reglamentadora de Telecomunicaciones y la Comisión Estatal para el Manejo de Emergencias, según informó.

El envío de mensajes de texto alertando a los clientes de T-Mobile, se realizó a la hora pautada y a una muestra de clientes determinada previamente.

Ésta muestra se determinó de acuerdo al plan de evacuación en la que se identificaron las áreas costeras más susceptibles y de mayor riesgo para este simulacro, según designado por la Agencia de Manejo de Emergencia.

Este ejercicio de simulacro no implicó la movilización de la población, más bien boletines que se emitieron en todos los medios de comunicación para orientar a las personas de la inminencia de un evento natural. La compañía envió un total de tres mensajes de texto a la muestra de clientes, dos de ellos para orientarlos sobre el simulacro /alerta de tsunami y uno informando que el simulacro había terminado.

“En T-Mobile estamos comprometidos con nuestros clientes, por esto contamos con un plan de emergencia y estamos siempre trabajando para garantizar la seguridad de nuestros clientes, empleados y la calidad de los servicios que ofrecemos. Nos aseguramos de participar en este ejercicio de simulacro y reafirmamos que siempre estamos en la mejor disposición para colaborar con la Junta Reglamentadora y las entidades Gubernamentales, más aún si involucra la seguridad

de nuestros clientes", informó por escrito Frances J. Rodríguez, Gerente de Comunicaciones de T-Mobile.

A continuación los mensajes que se enviaron a algunos de los clientes de la compañía de teléfonos:

1er Aviso:

Aviso1:_Simulacro_Tsunami:_Costa:_Norte_ y_Este:_Magnitud_7.6_9:03am_ Mar23:_A_25_millas_NE_Fajardo.En_un_aviso_debe_buscar_tierras_altas.Esto_es_un_simulacro

2ndo Aviso:

Aviso2:_Simulacro_Tsunami:_Costa:_Norte_ y_Este:_Magnitud_7.6_9:08am_ Mar23:_A_25_millas_NE_Fajardo.En_un_aviso_debe_buscar_tierras_altas.Esto_es_un_simulacro.

3er Aviso:
Simulacro_Tsunami:_concluye_simulacro_gracias_por_participar_Compañía_proveedora,_Junta_Reglamentadora_Telecomunicaciones-
Gobierno_de_Puerto_Rico.

http://www.primerahora.com/Xstatic/primerahora/template/content.aspx?se=nota&id=486515

Quejas en el oeste por falta de alarmas y alertas en ejercicio de tsunami

Miércoles, 23 de marzo de 2011 11:56 a.m. Maelo Vargas Saavedra / Primera Hora

La directora de la escuela intermedia Esteban Rosado Báez, en la zona costera de Mayagüez, se querelló que ni el sistema de comunicaciones ni la sirena funcionaron a las 9:00 de la mañana cuando debió activarse el alerta de tsunami para Puerto Rico como parte de un ejercicio oficial.

Ileana Ruiz de Pabón, que dirige el plantel de 197 estudiantes y 21 maestros, dijo que no fue hasta la 9:05 de la mañana cuando pudieron desalojar el plantel a instancias de un funcionario del Departamento de Educación, que evaluaba el simulacro.

Indicó que le tomó a algunos entre siete, 11 y 16 minutos llegar al lugar acordado de reunión en la urbanización Quinto Centenario, a relativa corta distancia de la escuela, a la entrada del barrio Maní de Mayagüez.

Mientras, la directora de la Segunda Unidad Sabaneta Maní, Angie Feliciano Méndez, dijo que desalojó el plantel en ruta a la última calle de esa comunidad, la Juan Rodríguez, por un estrecho callejón hasta tomar la carretera PR-64 y llegar al lugar de asamblea, cercano al cruce del aeropuerto de Mayagüez.

La escuela tiene una matrícula de 310, de Kinder a sexto grado.

En esa comunidad, los padres se querellaron que nunca escucharon la alarma, ubicada en la cancha a la entrada del Maní.

http://www.primerahora.com/Xstatic/primerahora/template/content.aspx?se=nota&id=486450

Simulacro de tsunami en el Caribe exhibe fallas

Por AP

23/03/2011 – 08:05 PM

San Juan.- Un ejercicio de simulacro de tsunami, impulsado por Naciones Unidas puso a prueba lo preparados que están los gobiernos del Caribe para afrontar un desastre que ha azotado a la región en varias ocasiones en los últimos 150 años.

Un total de 33 países participaron en el ejercicio y varios dijeron haber encontrado fallas en sus planes de respuesta a la emergencia.

Las autoridades de República Dominicana destacaron la falta de planes de evacuación.

Funcionarios de las Islas Vírgenes Estadounidenses se sorprendieron de que las estaciones de radio pudieron trasmitir una alerta en español pero no en inglés y que la señal de emergencia por radio resultó ser débil.

"Esta es una de las cosas que estamos analizando", dijo el director de la Oficina de Coordinación de Emergencias de la isla, Noel Smith.

Los funcionarios de la ONU indicaron que en el ejercicio se hizo un simulacro para un tsunami que sería generado por un sismo de magnitud 7,6. El ejercicio estuvo encaminado al análisis de las organizaciones gubernamentales, mientras que algunas naciones permitieron que algunos habitantes participaran en ello.

En Puerto Rico, decenas de ciudadanos se quejaron de que nunca escucharon las alarmas que deberían de haberles dado aviso. El Servicio Meteorológico de Estados Unidos indicó que sólo 11 de los 44 municipios costeros de Puerto Rico están listos para afrontar un tsunami.

Sin embargo, sí hubo historias de éxito.

Trabajadores en el manejo de emergencias en las Bahamas lograron emitir con éxito una alerta por mensaje de texto a 300 funcionarios en toda la cadena de islas, informo el comandante Stephen Russell, de la Oficina de Control de Emergencias.

Por su parte, el director de la oficina de emergencias de Jamaica, Ronald Jackson, indicó que las oficinas locales prefirieron mejorar la preparación de las habilidades de sus trabajadores en casos de desastre con sesiones de entrenamiento en vez de llevar a cabo el simulacro, y dijeron que esto se debió a la falta de recursos.

En tanto, el director de operaciones de emergencia en República Dominicana, Juan Manuel Méndez, afirmó que el país buscará elaborar planes de evacuación además de que evaluará edificios e infraestructura que podrían ser dañados por las olas de un tsunami.

Por lo menos nueve tsunamis se han registrado en el Caribe desde mediados del Siglo XIX, matando a por lo menos 3.500 personas, afirmó Ron Trumbla, un vocero del la Oficina Nacional sobre la Atmósfera y los Océanos.

Entre los tsunamis más recientes se encuentra uno que azotó a Puerto Rico en 1918, cuando mató a 140 personas y otros dos que golpearon a la República Dominicana en 1946, provocando 1.865 muertes.

Asimismo, un tsunami generado por el terremoto devastador de Haití mató a siete personas en la población pesquera de Petit Paradis.

Los resultados completos de este simulacro estarán disponibles el viernes, informo Bernardo Aliaga, vocero de la Comisión Oceanográfica Intergubernamental de la Organización de las Naciones Unidas para la Educación, la Ciencia y la Cultura (UNESCO).

http://www.zocalo.com.mx/seccion/articulo/simulacro-de-tsunami-en-el-caribe-exhibe-fallas

Inicia simulacro de Tsunami

Puerto Rico y 32 países participan desde las 9:00 am hasta 1:00 pm del simulacro Tsunami LANTEX 2011.

Por: Noticentro – 23/3/11 9:02 AM

Ya inició en Puerto Rico y en 32 países el simulacro Tsunami LANTEX 2011. Este ejercicio se realiza en toda la costa este de los Estados Unidos, Canadá, el Golfo de México y el Caribe.

El mismo inició con un supuesto terremoto a las 9:00 am, con la activación de un aviso de tsunami en los medios de comunicación a las 9:02 am. Las agencias de emergencias, Servicio Nacional de Meteorología y la Red Sísmica de Puerto Rico y medios de comunicación participan todo el día en este simulacro.

El Centro de Terremotos de Alaska y del Pacífico, en Conjunto con el Servicio Nacional de Meteorología de PR y varias agencias estatales podrán a prueba sus planes de trabajo ante la eventualidad de un desastre natural que da muy poco tiempo de reacción.

El ensayo servirá para probar la efectividad del sistema de alerta y los planes de trabajo de las agencias que deben ayudar a los supuestos afectados.

Algunas escuelas y compañías privadas también se han unido a la actividad.

http://www.wapa.tv/noticias/locales/inicia-simulacro-de-tsunami/20110323090231

UNITED STATES VIRGIN ISLANDS

Tsunami drill exposes flaws in Emergency Alert System

BY JOY BLACKBURN (DAILY NEWS STAFF)
Published: March 25, 2011

Wednesday's tsunami drill, which revealed a number of inadequacies in the territory's newly upgraded Emergency Alert System, was deemed a success by local emergency managers, who said it allows them to address the issues before a real emergency strikes.

The whole purpose of the drill was "to determine the strengths, to determine the weaknesses of the system and to address those weaknesses now rather than finding out what the issues are during an actual event," said Elton Lewis, director of the V.I. Territorial Emergency Management Agency.

Lewis, who is out of the territory this week attending a conference of the National Emergency Management Association, a professional association of state emergency management directors, said that he was pleased with the reports he had received on the drill.

Among the bugs in the system turned up by Wednesday's drill are a weak signal from St. Croix that caused several problems, poor audio quality and a recording that gave the tsunami warning first in Spanish, before providing a version in English, officials said.

The Emergency Alert System is a national public warning system of broadcasters, including television, cable, satellite and radio stations. The test involved that system and the National Oceanic and Atmospheric Administration's weather radios, said Christa von Hillebrant, director of NOAA's Caribbean Tsunami Warning Program.

It did not involve V.I. Alert, the territory's all-hazards alert and notification system, said Noel Smith, VITEMA deputy director.

Officials are trying to build redundancies and failsafes into the territory's system of notifying residents of an emergency, so that notification does not depend on a single system, Smith said.

The first objective of Wednesday's drill, in which the National Tsunami Hazard Mitigation Program's annual Atlantic tsunami exercise combined with a Caribbean-wide tsunami exercise, was to test communications from the West Coast Alaska Tsunami Warning Center to local focal points, von Hillebrant said.

"We were trying to see, in case of a tsunami, that that message goes through immediately," she said. The warning goes to the National Weather Service, which intercepts it and automatically broadcasts it through the Emergency Alert System and NOAA Weather Radio.

The territory received authorization from the Federal Communications Commission to conduct a live code test through radio and television stations that are voluntarily part of the Emergency Alert System, von Hillebrandt said. The warning was aired on radio and television stations, where the message also scrolled across the screen.

The exercise simulated a nearby magnitude 7.6 earthquake that generated a tsunami, prompting a widespread tsunami warning and watch situation throughout the Caribbean and requiring implementation of local response plans.

Not pass or fail

In a prepared statement that VITEMA released Thursday, Smith said VITEMA faced a number of challenges but pointed out that the drill "was not a pass or fail test, but an assessment of the system so that we can make improvements. What we found to be most important is that the EAS system does work and can be improved upon." EAS stands for Emergency Alert System.

Among the issues officials identified was poor audio quality that made the message hard to hear and somewhat unintelligible, according to the VITEMA release. There also was a lot of static, Smith said in an interview.

The signal for the territory is received through a radio station on St. Croix, and is then dispersed to other radio stations, Smith said. Although the signal coming to St. Croix was clear, there was a "notable" delay to St. Thomas stations receiving it, according to the VITEMA statement. Some St. Thomas stations did not receive the message at all, he said.

Also, because the message was generated from Puerto Rico, listeners heard the warning first in Spanish, then in English, Smith said.

Von Hillebrant said that glitches and bugs always turn up the first time a system is tested.

"That is exactly why we did this exercise. It was to identify the gaps we have in our tsunami warning system and to try to give whatever support we can so that those are being addressed," she said. "In Puerto Rico, we had the same kinds of issues last year when we first did the live codes."

Rafael Mojica, a meteorologist with the National Weather Service in San Juan, said that 12 radio stations and one television station in the Virgin Islands participated in the exercise.

He noted that finding the bugs and glitches in the system by testing it is one of the ways to "fine-tune" the system.

Smith said that VITEMA will work with Emergency Alert System participants, NOAA and the Federal Emergency Management Agency to address the problems that emerged during Wednesday's drill and thanked the broadcasters that participated.

Von Hillebrant said that while tsunami warning systems are important, residents also must rely on their common sense. A tsunami generated by a nearby earthquake would reach the territory's shores within minutes, she said.

"Sometimes we get a little hung up on the technology and forget about common sense," she said. "People have to be educated to identify the natural signals of an approaching tsunami, which is the earthquake and have their personal plan in place and know what to do."

If a local earthquake is very strong - strong enough to knock you down, make it very difficult to move, or cause cracks in the building - the advice, von Hillbrant said, is to protect yourself during the earthquake, then get to higher ground if you are in a low-lying or coastal area.

Contact Joy Blackburn at 774-8772 ext. 455 or e-mail jblackburn@dailynews.vi.

Read more: http://virginislandsdailynews.com/news/tsunami-drill-exposes-flaws-in-emergency-alert-system-1.1123584#ixzz1Hu4C8pOg

Tsunami drill shows gaps in Caribbean preparedness

The Associated Press

More News

A U.N.-organized tsunami drill Wednesday tested the preparedness of Caribbean governments for a disaster that has struck the region several times in the last 150 years.

Thirty-three governments participated in the exercise, and several reported gaps in their emergency response plans.

Dominican Republic officials noted the lack of evacuation plans.

Officials in the U.S. Virgin Islands were surprised that radio stations were able to broadcast an alert in Spanish but not in English and that the emergency broadcast signal was weak.

"That's one of the things we're looking into," said Noel Smith, director of the islands' emergency management agency.

U.N. officials said the exercise simulated a tsunami that could be generated by a 7.6-magnitude earthquake. The drill targeted government agencies, although some governments got residents involved.

In Puerto Rico, dozens of citizens complained that they never heard the sirens meant to alert them. The U.S. National Weather Service has deemed only 11 of the island's 44 coastal municipalities ready for a tsunami.

There were successes.

Emergency management workers in the Bahamas successfully issued an alert by text message to 300 officials across the island chain, said Commander Stephen Russell at the emergency management agency.

Ronald Jackson, director of Jamaica's emergency management office, said local agencies worked to improve staffers' disaster preparedness skills with training sessions rather than stage the drill. He cited a lack of resources.

Juan Manuel Mendez, director of emergency operations in the Dominican Republic, said the country aims to draw up evacuation plans as well as evaluate buildings and infrastructure that could be damaged by a tsunami.

At least nine tsunamis have hit the Caribbean since the mid-1800s, killing more than 3,500 people, said Ron Trumbla, a spokesman for the United States' National Oceanic and Atmospheric Administration.

The most recent tsunamis include one that hit Puerto Rico in 1918, killing 140 people, and two tsunamis that struck the Dominican Republic in 1946, causing 1,865 deaths. A tsunami caused by last year's devastating earthquake in Haiti killed seven people in the fishing town of Petit Paradis.

The full results of the tsunami exercise will be available Friday, said Bernardo Aliaga, a spokesman with UNESCO's Intergovernmental Oceanographic Commission.

Posted on Wed, Mar. 23, 2011 05:26 PM

Read more: http://www.kansascity.com/2011/03/23/2747916/tsunami-drill-shows-gaps-in-caribbean.html#ixzz1HtzOhhz1

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