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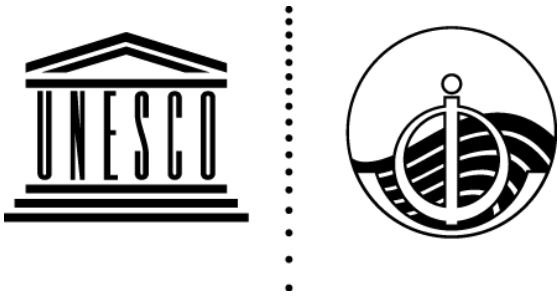

EXERCISE CARIBE WAVE 17

A Caribbean and Adjacent Regions Tsunami Warning Exercise

21 March 2017 (Costa Rica, Cuba and Northeastern Antilles Scenarios)

Volume 1 Participant Handbook

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

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Summary

The Intergovernmental Coordination Group for Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE EWS) of the United Nations Educational, Scientific, and Cultural Organization's (UNESCO) Intergovernmental Oceanographic Commission (IOC), the U.S. National Oceanic and Atmospheric Administration (NOAA), and the Caribbean Regional Emergency Management Stakeholders (CEPREDENAC, CDEMA, and EMIZ) will be conducting the CARIBE WAVE tsunami exercise on March 21, 2017. The purpose of this exercise is to advance tsunami preparedness efforts in the Caribbean Region.

Three exercise scenarios are planned. The first scenario simulates a tsunami generated by a magnitude 7.9 earthquake located off the Caribbean coast of Costa Rica, in the southern Caribbean Sea. The second scenario is a tsunami generated by a magnitude 8.2 earthquake located off the southeastern coast of Cuba, in the northwestern portion of the Caribbean Sea. The third scenario is a tsunami generated by a magnitude 8.5 earthquake located East of the Northeastern Antilles. The initial dummy message for the three scenarios will be issued by the CARIBE EWS Tsunami Service Provider [Pacific Tsunami Warning Center (PTWC)] on March 21, 2017 at 1400 UTC and disseminated over all its standard broadcast channels. The dummy message is issued to test communications between the PTWC with Tsunami Warning Focal Points (TWFPs) and National Tsunami Warning Centers (NTWCs), and to start the exercise. As of 1405 UTC the PTWC will only send by emails the simulated tsunami products to officially designated TWFPs and NTWCs. Each country and territory will choose one scenario and decide if and how to disseminate messages within its area of responsibility.

The manual includes information on the tsunami and earthquake scenarios, timelines, and the PTWC dummy message and simulated exercise threat messages. High levels of vulnerability and risk to life and livelihoods from tsunamis along the Caribbean coast should provide a strong incentive for countries and local jurisdictions to prepare for a tsunami and participate in this exercise.

1. BACKGROUND

1.1 EXERCISE JUSTIFICATION AND FRAMEWORK

This tsunami exercise is being conducted to assist tsunami preparedness efforts throughout the Caribbean region. Recent tsunamis, such as those in the Indian Ocean (2004), Samoa (2009), Haiti (2010), Chile (2010, 2014, 2015), and Japan (2011), attest to the importance of proper planning for tsunami response.

Historical tsunami records from sources such as the NOAA National Centers for Environmental Information (NCEI) show that over 75 tsunamis 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. According to NCEI, in the past 500 years 4,561 people have lost their lives to tsunamis in the Caribbean and Adjacent Regions. Since the most recent devastating tsunami of 1946, there has been an explosive population growth and influx of tourists along the Caribbean and Western Atlantic coasts increasing the tsunami vulnerability of the region (von Hillebrandt-Andrade, 2013). In addition to tsunamis, the region also has a long history of destructive earthquakes. Historical records show that major earthquakes have struck the Caribbean region many times during the past 500 years. Within the region there are multiple fault segments and submarine features that could be the source of earthquake and landslide generated tsunamis (Figure 2). The perimeter of the Caribbean plate is bordered by no fewer than four major plates (North America, South America, Nazca, and Cocos). Subduction occurs along the eastern and northeastern Atlantic margins of the Caribbean plate. Normal, transform thrust and strike slip faulting characterize northern South America, eastern Central America, the Cayman Ridge and Trench and the northern plate boundary (Benz et al, 2011). In addition to the local and regional sources, the region is also threatened by tele-tsunamis/trans-Atlantic tsunamis, like that of 1755 from Lisbon. With nearly 160 million people (Caribbean, Central America and Northern South America) now living in this region and a major earthquake occurring about every 50 years, the question is not if another major tsunami will happen, but when it happens will the region be prepared for the impact. The risk of earthquakes generating tsunamis in the Caribbean is real and should be taken seriously.

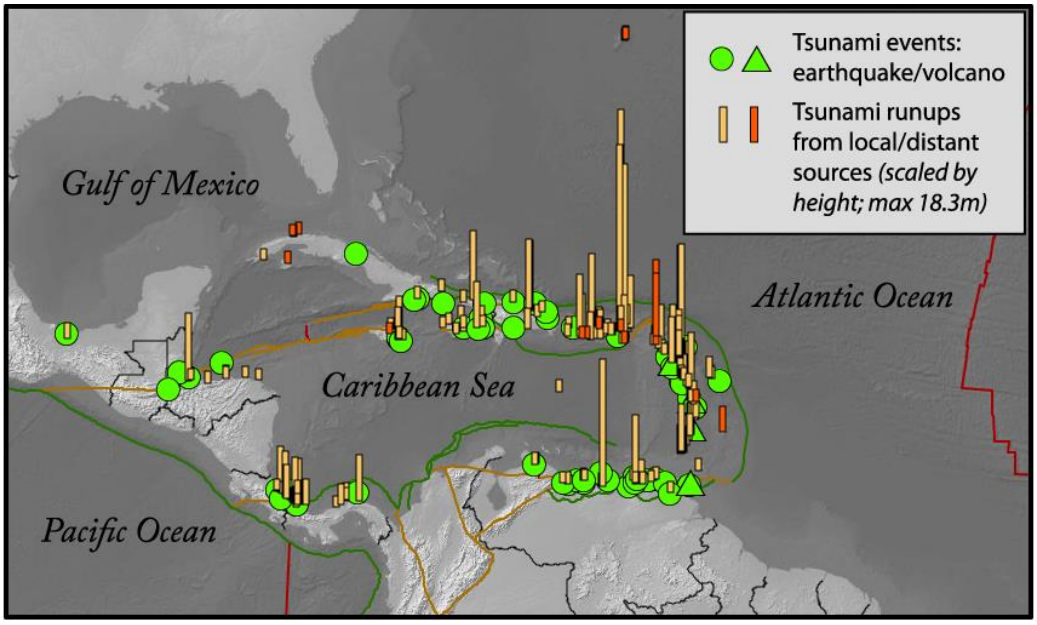

Figure 1. Map of tsunami run-ups in the Caribbean 1493-2013 (National Centers for Environmental Information, http://www.ngdc.noaa.gov/hazards/tsu.shtml). Artist: Jessee Varner; originally published in von Hillebrandt-Andrade, 2013.

Tsunami services for the Caribbean and Adjacent Regions within the UNESCO IOC CARIBE EWS framework are currently provided by the PTWC in Honolulu. On March 1st, 2016 enhanced tsunami products for CARIBE EWS were implemented. The PTWC issues these tsunami products approximately two to ten minutes after the occurrence of an earthquake. As of 2016 the PTWC international products include public tsunami information and threat messages (no longer watch messages). Primary recipients of the PTWC messages include TWFPs and NTWCs. These agencies, which also receive graphical and other products, are responsible to issue the corresponding warning messages within their area of responsibility according to established protocols.

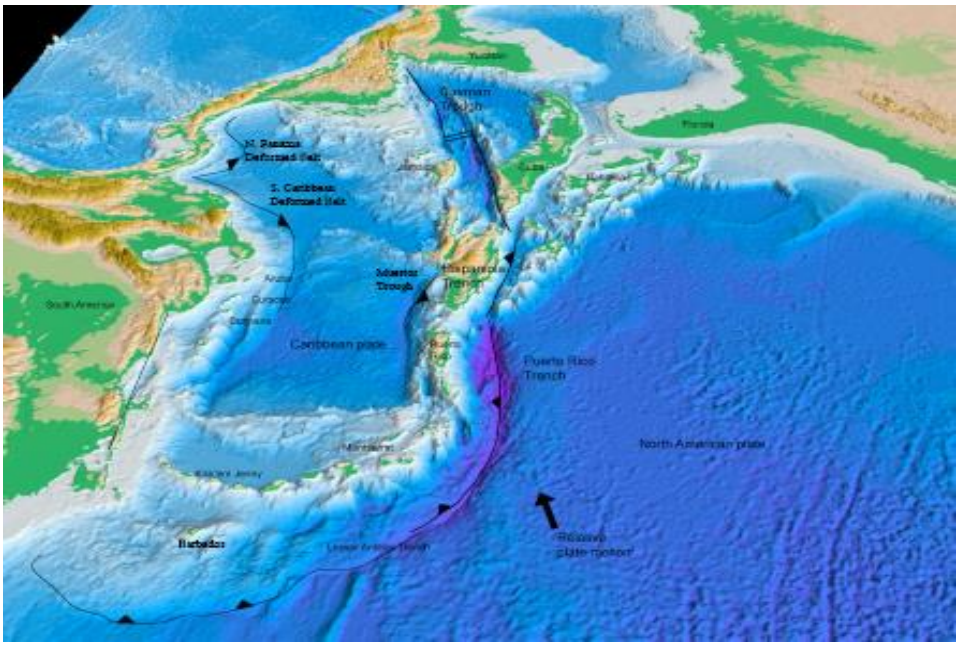

Figure 2. Tectonic features in the Caribbean (ten Brink et al., 2008).

1.2 EXERCISE EARTHQUAKE AND TSUNAMI SCENARIO

This exercise will provide simulated tsunami threat messages from the PTWC based on a hypothetical magnitude Mw 7.9 earthquake located off the Caribbean coast of Costa Rica, a Mw 8.2 earthquake located along the southeastern coast of Cuba and a Mw 8.5 earthquake along the Northern Lesser Antilles (Figure 3).

1.2.1 Costa Rica Scenario

Costa Rica is bounded on the west by the subduction of the Cocos plate under the Caribbean plate, and partially on the east by the North Panama Deformed Belt (NPDB). The NPDB is characterized by crustal folding and thrust faulting in addition to continuation of thrust faulting on land (Lundgren, et. al., 1993). While the recorded seismicity along the Costa Rica Caribbean coastal margin has been relatively low compared to its counter Pacific side, the westernmost extent of the North Panama Deformed Belt (NPDB) produced a Mw. 7.7 earthquake on April 22, 1991 that resulted in tsunami runup up to 2 m (Plafker and Ward, 1992) and maximum inundation of 300 m near Cahuita-Puerto Viejo, Costa Rica. According to a comparison of GPS measurements from before and after the earthquake, co-seismic horizontal displacements at Limon, Bratsi, Vueltas and ETCG (in San Jose) measured 244.7 ± 0.8, 89.2 ± 0.9, 12.4 ± 1.3, and 1.9 ± 0.9 cm while vertical displacements measured 16.3 ± 2.1, 15.3 ± 3.0, -10.5 ± 4.4, and -0.6 ± 2.1 cm respectively (Lundgren et al., 1993). Other authors reported coseismic uplift up to 157 cm (Plafker and Ward, 1992) and 185 cm (Denyer et al., 1994). For this exercise a M 7.9 earthquake located at 9.4°N 82.5°W ruptures a 150 km

long by 45 km wide fault segment at 19 km depth. The scenario produces localized wave amplitudes between one and more than three meters, and regional amplitudes less than one meter. Shaking intensities reach up to VIII on the Modified Mercalli Intensity Scale, according to Shakemap (Appendix D).

1.2.2 Cuba Scenario

The southern margin of Cuba marks a segment of the northern boundary of the Caribbean Plate. It is represented by the Oriente fault, a left-lateral east strike-slip fault characterized by a transpressional mechanism and dextral offset segments. South of this margin, several morphologic features are identified: the Oriente Wall, the Cabo Cruz basin, the East Deep, the Santiago Promontory, the Imias Basin, the Chivirico and the Baitiquiri basins, and the Windward Passage. It is within the Oriente deep depression that the Santiago Deformed Belt undergoes compression and dips towards the north (Calais and Lepinay, 1991). According to www.ngdc.noaa.gov/, in 1775 an earthquake in the vicinity of Santiago de Cuba produced a tsunami that affected parts of Haiti and the south of Cuba. Also, in 1832, a possible earthquake at sea produced waves that affected the bay at Santiago de Cuba. For this exercise a rupture in the Santiago Deformed Belt located at 19.6°N 76.4°W produces an earthquake of Mw. 8.24 with a 270 km long by 40 km wide fault plane 20 km deep. The scenario produces local and regional wave amplitudes reaching more than three meters.

1.2.3 Northeastern Antilles Scenario

Along the Northeastern Antilles arc, the Atlantic plate subducts below the Caribbean at a rate of 2 cm per year. The subduction turns nearly perpendicular to the trench at latitudes 12°N and 19°N. Here, in 1843 a major earthquake with estimated magnitudes between M 7.0-M 8.7 and a rupture length between 100-300 km affected the Lesser Antilles region (Hayes et al., 2013). This event produced a tsunami with maximum water height of 1.2 m at Antigua (https://www.ngdc.noaa.gov). For this exercise a 10 m slip results in a M 8.5 event located at 17°N and 67°W that ruptures a segment 200 km long and 65 km wide, located at 40 km depth. Based on Bilek and Lay (1999), and the depth of 35 km, a shear modulus of 50 GPa was used. The scenario produces waves of maximum amplitudes larger than three meters, mostly locally, and waves up to three meters at a regional scale.

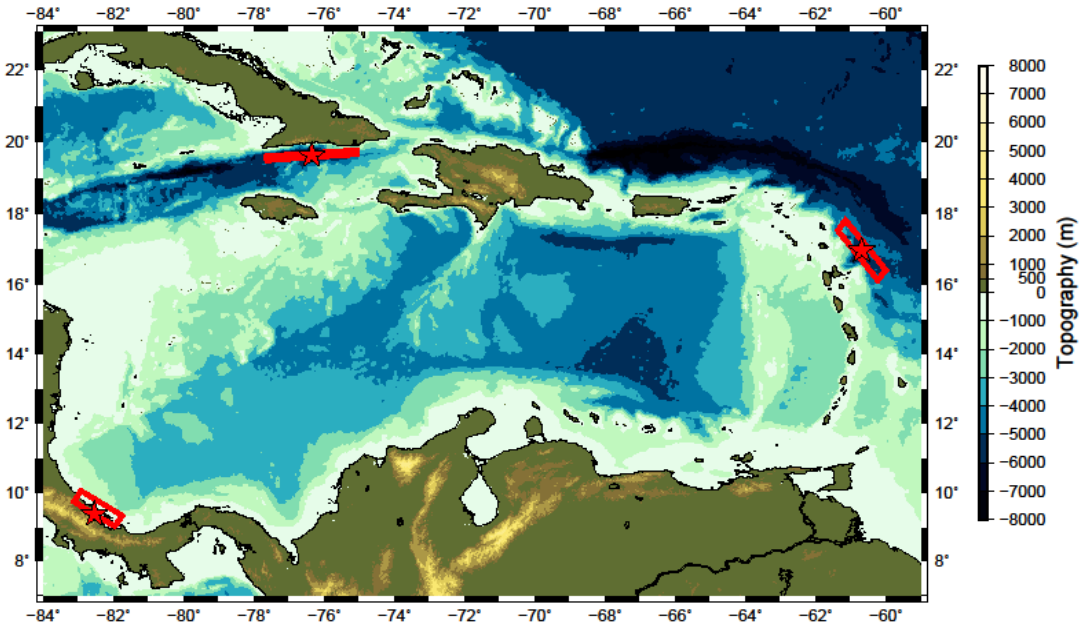

Figure 3. CARIBE WAVE 17 scenario map indicating epicenters and fault segments, elaborated using etopo1 model (Amante and Eakins, 2009). The Generic Mapping Tool (GMT) generated the figure (Wessel et al., 2013).

1.2.4 Earthquake impact

When planning for tsunamis, in addition to knowing the potential impact from the waves, it is also important to consider the potential earthquake impact. This is especially important for the near field. In consideration of this, the United States Geological Survey (USGS) provided for the CARIBE WAVE 17 scenarios the simulated outputs of their ShakeMap and the Prompt Assessment of Global Earthquakes for Response (PAGER) products. These results provide emergency responders, government, aid agencies and the media the scope of the potential earthquake related disaster. ShakeMap illustrates the ground shaking levels close to the earthquake source depending on a set of parameters such as distance to the source, rock and soil behavior and seismic wave propagation through the crust (http://earthquake.usgs.gov/research/shakemap/). PAGER is based on the earthquake shaking (via ShakeMap) and analyses of the population exposed to each level of shaking intensity with models of economic and fatality losses based on past earthquakes in each country or region of the world (http://earthquake.usgs.gov/research/pager/). For the CARIBE WAVE 17 scenarios, the USGS estimated that significant casualties and damage are likely from the earthquakes themselves, which would require regional or national level response. According to the PAGER results, the countries that are going to receive the greatest impact from the earthquakes are Costa Rica, Cuba, Antigua and Barbuda and Guadalupe. The complete ShakeMap and PAGER output for the exercise scenarios is available in the Annex D of this handbook.

Exercises help improve the readiness of countries of the Caribbean and Adjacent to respond in the event of a dangerous tsunami. Similar recent exercises in the Caribbean and Adjacent Regions (CARIBE WAVE and LANTEX) as well as the Pacific and Northeast Atlantic and Mediterranean Basins have proven effective in strengthening preparedness levels of emergency management organizations and the populations at risk.

2. EXERCISE CONCEPT

2.1 PURPOSE

The purpose of the exercise is to improve Tsunami Warning System effectiveness along the coasts of the Caribbean and Adjacent Regions. The exercise provides an opportunity for the corresponding emergency management organizations 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 the Caribbean and Adjacent regions, where tsunamis are infrequent but can be of very high impact. All emergency management organization (EMO) are encouraged to participate and include the communities at risk.

2.2 OBJECTIVES

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

1. **To exercise and evaluate operations of the CARIBE EWS Tsunami Warning System.**
    A. Validate the **issuance** of tsunami products from the PTWC.
    B. Validate the **receipt** of tsunami products by CARIBE EWS Tsunami Warning Focal Points (TWFPs) and/or National Tsunami Warning Centers NTWCs).
2. **To evaluate the use of PTWC CARIBE EWS products.**

3. **To validate the readiness to respond to a tsunami.**

    A. Validate the operational readiness of the TWFPs/ NTWCs and/or the National Disaster Management Office (NDMO).

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

    C. Validate that the dissemination of warnings and information/advice by TWFPs, and NTWCs, to relevant in-country agencies and the public is accurate and timely.

    D. Validate the organizational decision-making process (tsunami response plans) about public warnings and evacuations.

    E. Validate that the methods used to notify and instruct the public are accurate and timely.

    F. Evaluate the status of the implementation of the TsunamiReady recognition program.

2.3 TYPE OF EXERCISE

The exercise should be carried out such that communications and decision making at various organizational levels are exercised and conducted without alarming the general public. Offices of Emergency Management (OEM) are, however, encouraged to exercise down to the level of testing local notification systems such as the Emergency Alert System (EAS), sirens, or loudspeakers to engage communities at risk.

Exercises stimulate the development, training, testing, and evaluation of Disaster Plans and Standard Operating Procedures (SOP). Most countries in the region have participated in SOP workshops in 2013-2015, and should use the materials and expertise acquired to help guide exercise preparation and conduct. Annex A gives an overview of SOPs. Exercise participants may also use their own past multi-hazard drills (e.g. flood, hurricane, tsunami, earthquake, etc.) as a framework to conduct CARIBE WAVE 17.

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

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

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

3. **Tabletop Exercise:** The Tabletop Exercise is a planned activity in which local officials, key staff, and organizations with disaster management responsibilities are presented with simulated emergency situations. It is usually informal, in a conference room environment, and is designed to elicit constructive discussion from the participants. Participants will examine and attempt to resolve problems, based on plans and procedures, if they exist. Individuals are encouraged to discuss decisions in depth with emphasis on slow-paced

problem solving, rather than rapid, real time decision-making. A Tabletop Exercise should have specific goals, objectives, and a scenario narrative (see Annex B for a Sample Tabletop Exercise Outline).

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

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

Example Time Frames for Different Exercise Types

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

2.4 TIMELINE

The following table highlights the timeline of actions to be taken, before, during and after CARIBE WAVE 17.

ACTION	DUE DATE
Draft Circulated among ICG CARIBE EWS TNC/TWFP	Sep-16
Deadline for Comments	Sep-16
Final Exercise Handbook Available Online	Oct-16
Circular Letter Issued by IOC to MS	Nov-16
1st Webinar CW	17 - Jan- 2017 -English 18 - Jan- 2017 -Spanish 19 - Jan- 2017 -French
2nd Webinar CW	7- Mar- 2017 -English 8- Mar- 2017 -Spanish 9- Mar- 2017 -French
Member States and Territories inform which scenario they will be using for the exercise	10-Mar-2017
Exercise	21-Mar-17
Exercise Evaluation Due	3-Apr-17
Draft Final Caribe 17 Report	19-Apr-17
Discussion of Exercise ICG CARIBE EWS 12th Session	10-12-May-17

3. PTWC PRODUCTS

On March 1st, 2016 the CARIBE EWS fully transitioned to the PTWC Enhanced Products. As of the second message these products are threat-based on tsunami wave forecasts, rather than on earthquake magnitude thresholds and travel time. Several levels of tsunami threat have been established, and forecast threat levels are assigned to polygons representing segments of extended coastlines or to island groups. These improvements should greatly reduce the number of areas warned unnecessarily and also provide some advance notice of potential local tsunamis. Details on the PTWC Enhanced Products for the CARIBE EWS are provided in the "User's Guide for the Pacific Tsunami Warning Center Enhanced Products for the CARIBE EWS" (http://www.caribewave.info). For the CARIBE WAVE 17, threat messages and enhanced graphical products for the chosen scenario by each Member State and Territory will be disseminated by email to officially designated TWFPs and NTWCs. These products have also been included in Annexes C and F. Therefore each country and territory have to decide if and how to disseminate messages within its areas of responsibility.

There are important differences between PTWC's previous products and its enhanced products. Previous products used the term "watch" to indicate that there was a potential threat to the countries within the watch. Specifically, a country was designated by PTWC as being in a Tsunami Watch depending upon the tsunami threat presented by the event (e.g. earthquake magnitude and location), as well as the time remaining until the potential tsunami impact. Over the last several years, however, the use of the term "Watch" caused concern that the PTWC-designated level of alert could conflict with a country's independently derived level of alert. As each country is sovereign and thus responsible for the safety of its own population, the PTWC

enhanced products no longer use the “watch” term but as of March 1st, 2016 instead provide forecasted wave heights along coasts.

4. EXERCISE OUTLINE

4.1 GENERAL

Tsunami messages for this exercise are issued by the PTWC based on three hypothetical earthquakes with the following hypocenter parameters:

Costa Rica Earthquake Scenario:
- Origin Time 14:00:00 UTC March 21, 2017
- Latitude 9.37º
- Longitude -82.54º
- Magnitude 7.9 – Mw
- Depth 19 km

Cuba Earthquake Scenario:
- Origin Time 14:00:00 UTC March 21, 2017
- Latitude 19.625º
- Longitude -76.35º
- Magnitude 8.2 – Mw
- Depth 20 km

Northeastern Antilles Earthquake Scenario:
- Origin Time 14:00:00 UTC March 21, 2017
- Latitude 16.96º
- Longitude -60.69º
- Magnitude 8.5 – Mw
- Depth 10 km

Expected impacts for these events are determined from pre-computed tsunami forecast models. The models indicate a significant tsunami along many coasts in the Caribbean Sea. Annex C provides model results.

Pacific Tsunami Warning Center

While the first tsunami threat message issued by PTWC is based on the earthquake magnitude and location and the tsunami travel times. As of the second message they are based on tsunami wave forecasts, rather than based upon seismic information. Tsunami threat forecasts indicate the levels of threat that have been forecast and to which countries or places they apply. The levels are tsunami heights of 0.3-1 meter, 1-3 meters, and greater than 3 meters above the normal tide level are determined. The threats are updated usually within an hour. All simulated products (text and graphical) for the scenarios chosen by the country will be disseminated through email to the corresponding TWFPs and NTWCs. Further dissemination will be the responsibility of the corresponding national and local authorities.

The only message that the PTWC will issue live over all its standard broadcast dissemination channels is the initial dummy message to start the exercise at 1400 UTC on March 21, 2017. The World Meteorological Organization (WMO) and Advanced Weather Interactive Processing System (AWIPS) headers to be used in the dummy message are listed in Table 1. Please note that the PTWC dummy messages are being issued with the WMO/AWIPS IDs WECA41 PHEB/TSUCAX. These are being issued to test communications with TWFPs and NTWCs, and to start the exercise. The content of the dummy messages is given in Annex E.

For CARIBE WAVE 17 each Member State needs to select one scenario. By March 10, 2017 they must inform their selection to PTWC (charles.mccreery@noaa.gov and gerard.fryer@noaa.gov) with a copy to the Caribbean Tsunami Warning Program (carolina.hincapie@noaa.gov and cherrymar.reyes@noaa.gov). If the Member State does not inform the PTWC and CTWP, the organizers will decide for which scenario the PTWC will send the products. For the exercise the TWPF/ NTWC will receive only the simulated product for that scenario.

Table 1. Product Types Issued for Dummy Message with Transmission Methods

Center	WMO ID	AWIPS ID	NWWS	GTS	EMWIN	AISR	Fax	Email
PTWC	WECA41 PHEB	TSUCAX	Yes	Yes	Yes	Yes	Yes	Yes

NWWS NOAA Weather Wire Service
GTS Global Telecommunications System
EMWIN Emergency Managers Weather Information Network
AISR Aeronautical Information System Replacement

Participants should follow the schedule in Tables 2, 3 and 4, for each scenario, to look at new messages. Those tables include the timelines for when messages would be issued by the PTWC if this were a real event, and can be used by EMOs to drive the exercise timing. The messages (as shown in Annex F) cover between a 5 minutes and 7-hour period from earthquake origin time, though in an actual event they would likely continue much longer.

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 Annex F, will facilitate this approach.

EMOs can 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.

4.2 MASTER SCHEDULE (EXERCISE SCRIPT)

4.2.1 Costa Rica Scenario

The Costa Rica scenario consists of a tsunami generated by a magnitude 7.9 earthquake with epicenter at 9.37º, -82.54º occurring on March 21, 2017 at 1400 UTC. The initial alert is disseminated at 1405 UTC.

Table 2. Timeline Messages issued by PTWC

Date	Time (UTC)	PTWC	
		Type of Product	**Transmission Method**
3/21/17	**1400**	**- - - - E a r t h q u a k e O c c u r s - - - -**	
3/21/17	**1400**	Dummy	NWWS, GTS, EMWIN, AISR, Fax, Email
3/21/17	**1405**	Tsunami Threat Message #1	Email
3/21/17	**1425**	Tsunami Threat Message # 2 and Graphic Enhanced Product	Email
3/21/17	**1525**	Tsunami Threat Message #3	Email
3/21/17	**1625**	Tsunami Threat Message #4	Email
3/21/17	**1725**	Tsunami Threat Message #5	Email
3/21/17	**1825**	Tsunami Threat Message #6	Email
3/21/17	**1925**	Final Tsunami Threat Message #7	Email

4.2.2 Cuba Scenario

The Cuba scenario consists of a tsunami generated by a magnitude 8.2 earthquake with epicenter at 19.625º, -76.35º occurring on March 21, 2017 at 1400 UTC. The initial alert is disseminated at 1405 UTC.

Table 3. Timeline Messages issued by PTWC

Date	Time (UTC)	PTWC	
		Type of Product	**Transmission Method**
3/21/17	**1400**	**- - - - E a r t h q u a k e**	**O c c u r s - - - -**
3/21/17	**1400**	Dummy	NWWS, GTS, EMWIN, AISR, Fax, Email
3/21/17	**1405**	Tsunami Threat Message #1	Email
3/21/17	**1425**	Tsunami Threat Message # 2 and Graphic Enhanced Product	Email
3/21/17	**1525**	Tsunami Threat Message #3	Email
3/21/17	**1625**	Tsunami Threat Message #4	Email
3/21/17	**1725**	Tsunami Threat Message #5	Email
3/21/17	**1825**	Tsunami Threat Message #6	Email
3/21/17	**1925**	Tsunami Threat Message #7	Email
3/21/17	**2025**	Tsunami Threat Message #8	Email
3/21/17	**2125**	Final Tsunami Threat Message #9	Email

4.2.3 Northeastern Antilles Scenario

The Northeastern Antilles scenario corresponds to a tsunami generated by a magnitude 8.5 earthquake with epicenter at 16.96º, -60.69º occurring on March 21, 2017 at 1400 UTC. The initial alert is disseminated at 1405 UTC.

Table 4. Timeline Messages issued by PTWC

Date	Time (UTC)	PTWC	
		Type of Product	**Transmission Method**
3/21/17	**1400**	**- - - - E a r t h q u a k e O c c u r s - - - -**	
3/21/17	**1400**	Dummy	NWWS, GTS, EMWIN, AISR, Fax, Email
3/21/17	**1405**	Tsunami Threat Message #1	Email
3/21/17	**1425**	Tsunami Threat Message # 2 and Graphic Enhanced Product	Email
3/21/17	**1525**	Tsunami Threat Message #3	Email
3/21/17	**1625**	Tsunami Threat Message #4	Email
3/21/17	**1725**	Tsunami Threat Message #5	Email
3/21/17	**1825**	Tsunami Threat Message #6	Email
3/21/17	**1925**	Tsunami Threat Message #7	Email
3/21/17	**2025**	Tsunami Threat Message #8	Email
3/21/17	**2125**	Final Tsunami Threat Message #9	Email

4.3 ACTIONS IN CASE OF A REAL EVENT

In the case of a real event occurring during the exercise, the PTWC will issue the corresponding messages for that event. Such messages will be given full priority and a decision will be made by the PTWC whether to issue the Caribe Wave 17 dummy messages and to send email messages to corresponding recipients. In the case of smaller earthquakes, PTWC will issue the corresponding Tsunami Information Statement and the exercise will not be disrupted. All documentation and correspondence relating to this exercise is to be clearly identified as "**CARIBE WAVE 17"** and "**Exercise**."

4.4 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 misinterpretation by media or the public.

4.5 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 the members of the CARIBE WAVE 17 Task Team (Table 4).

4.6 COMMUNITY REGISTRATION

For CARIBE WAVE 17, the Caribe EWS has teamed up with TsunamiZone.org for online registration. Under the Caribbean Zone Region Tab participants will be able to sign up and choose among the following community categories: individuals, businesses, schools, faith-based organizations, community groups, government agencies, individuals. The link for registration is http://tsunamizone.org/caribbean. After registering, they will be sent a confirmation email. If desired, participants can also opt to be listed in the "Who is participating?" section of the TsunamiZone website, along with participants in tsunami preparedness activities worldwide. The EMOs will thus have real time access to the status of registration of participants within their areas of responsibility. EMOs are encouraged to promote this registration system. In CARIBE WAVE 2016 over 331,000 were registered.

4.7 MEDIA ARRANGEMENTS

One advantage in conducting exercises is that it provides a venue to promote tsunami awareness. Many residents along the CARIBE EWS coast may not realize that a regional tsunami warning system exists, nor that national authorities have protocols in place to issue tsunami alerts, let alone the proper response for individuals. Therefore communities may wish to invite their local media to the exercise and to promote the awareness of the local tsunami hazard and protocols. Within all countries the media can also provide support in building awareness leading up to the exercise and avoid false alarms. The media should be provided with available informational brochures prepared by the local, regional and international agencies. It is also a good opportunity to distribute or prepare Media Guides like that of the Puerto Rico Seismic Network (PRSN) (http://www.prsn.uprm.edu/mediakit/) and the Seismic Research (http://www.uwiseismic.com) as additional guidance. Annex G contains a sample press release, which can be adapted as necessary.

Social media has been recognized as a very important means for disseminating tsunami information and products. CARIBE EWS countries and territories are encouraged to share

information on the exercise CARIBE WAVE 17 through this medium. Furthermore, it is recommended that the hashtag **#CaribeWave**, be used by the participants before and during the exercise.

Table 4. Members of the CARIBE WAVE 17 Task Team

Person	Telephone #	Email
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Bladimir Moreno, Scientific Expert – Cuba Scenario	582- 641112	bladimir@cenais.cu

5. POST-EXERCISE EVALUATION

Each CARIBE EWS member state and territory is requested to provide feedback on the exercise. This feedback will assist the ICG/CARIBE-EWS in the evaluation of Caribe Wave 17

and the development of subsequent exercises, and help response agencies document lessons learned. To facilitate feedback the online evaluation survey can be accessed at the following link: https://www.surveymonkey.com/r/CaribeWave17. The deadline for completing the evaluation is **April 3, 2017.**

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Annex A. Standard Operating Procedures

END-TO-END TSUNAMI WARNING for Tsunami Warning Focal Points and Tsunami Emergency Response Operations– AN OVERVIEW
September 2008 (updated 2012)
UNESCO IOC Tsunami Unit (Paris) with ITIC (Hawaii)

This overview summarizes an end-to-end tsunami warning. In event time, it covers activities for event monitoring, detection, threat evaluation and warning, alert dissemination, emergency response, and public action. An effective tsunami warning system is achieved when all people in vulnerable coastal communities are prepared to respond appropriately and in a timely manner upon recognizing that a potential destructive tsunami may be approaching. Meeting this challenge requires round-the-clock monitoring with real-time data streams and rapid alerting, as well as prepared communities, a strong emergency management system, and close and effective cooperation and coordination between all stakeholders. To warn without preparing, and further, to warn without providing a public safety message that is understandable to every person about what to do and where to go, is clearly useless. While alerts are the technical trigger for warning, any system will ultimately be judged by its ability to save lives, and by whether people move out of harm's way before a big tsunami hits. Towards these ends, education and awareness are clearly essential activities for successful early warning.

An end-to-end tsunami warning involves a number of stakeholders who must be able to work together and with good understanding of each other's roles, responsibilities, authorities, and action during a tsunami event. Planning and preparedness, and practicing in advance of the real event, helps to familiarize agencies and their staff with the steps and decision-making that need to be carried out without hesitation in a real emergency. Tsunami resilience is built upon a community's preparedness in tsunami knowledge, planning, warning, and awareness. All responding stakeholders should have a basic understanding of earthquake and tsunami science, and be familiar with warning concepts, detection, threat evaluation, and alerting methods, and emergency response and evacuation operations. The key components, requirements, and operations to enable an effective and timely warning and evacuation are covered in the following topics of end to-end tsunami warning:

- Tsunami Science and Hazard Assessment
- Tsunami Risk Reduction Strategy and community-based disaster risk management
- Stakeholders, Roles & Responsibilities, and Standard Operating Procedures (SOPs) and their Linkages
- End-to-end Tsunami Response and SOPs
- Tsunami Warning Focal Point (TWFP) and National Tsunami Warning Centre (NTWC) operations
- Tsunami Emergency Response (TER) operations
- Public Alerting
- The Role of Media
- Evacuation and Signage
- Use of Exercises to Build Preparedness
- Awareness and Education

To ensure the long-term sustainability of a tsunami warning system, it should be noted that:

- Tsunamis should be part of an all-hazards (natural and man-made) strategy.
- System redundancy is required to ensure reliability.
- Clearly understood TWFP/TWC and TER public safety messages are essential. Media partnerships for warning, as well as preparedness, are important.
- Awareness must be continuous forever. Tsunamis are low frequency, high impact natural

disasters that are also unpredictable.
- National, provincial, and local Tsunami Coordination Committees ensure stakeholder coordination and implementation of the end-to-end tsunami warning.

For specific details and algorithms and for actual descriptions of tsunami warning and emergency response operations, including data networks and data collection, methods of evaluation and criteria for action, products issued and methods of communication of alerts, and evacuation, original source references or plans should be consulted. These are the high-level system descriptions or concepts of operation, agency operations manuals, and user's guides of each regional and national system.

Basic references providing a comprehensive summary on tsunami warning center and emergency response operations considerations are:
- ITIC IOC Manual on Tsunami Warning Centre Standard Operating Procedures (Guidance and Samples), version 2010 (distributed as part of 2013 SOP capacity building).
- ITIC IOC Manual on Tsunami Emergency Response Standard Operating Procedures (Guidance and Samples), version 2010 (distributed as part of 2013 SOP capacity building)

For a description of the Caribbean tsunami warning system, consult the Pacific Tsunami Warning Center Enhanced Products for the CARIBE-EWS Users Guide (version 1.2 October 8, 2015). It can be accessed at: NWS/CTWP http://caribewave.info.

TRAINING

In order to assist countries in strengthening their warning systems, the IOC has compiled and developed a Training Manual containing references, best practices, decision support tools, and guidance materials summarizing key components, requirements, and operations to enable an effective and timely warning and evacuation against tsunamis. The materials were developed under the lead of the ITIC and in close partnership with experienced practitioners in tsunami warning and emergency response, and have been used in numerous training courses since the 2004 Indian Ocean tsunami.

The Manual includes session plans, lectures (in Power Point), exercises, and multi-media materials. Together, they represent part of the IOC's collaborative contribution to national capacity building and training on end-to-end tsunami warning and tsunami standard operating procedures to countries of the Indian Ocean, Pacific, Southeast Asia, and the Caribbean. For more information, please contact Laura Kong, Director, ITIC (laura.kong@noaa.gov), Bernardo Aliaga, IOC b.aliaga@unesco.org), Christa von Hillebrandt, US NWS Caribbean Tsunami Warning Program (christa.vonh@noaa.gov), or Alison Brome (a.brome@unesco.org). The tables presented below can be used as a guide for preparing the timeline for the exercise.

Table A1. Table to be used as a guide the timing, actions, authority, communication means and target audiences for a tsunami event.

Tsunami Evacuation Responsibilities Checklist for Government Disaster Response Agencies		
This is a simple checklist to use when doing an evacuation. List the agency(ies) / department(s) responsible for actions and recommended number of minutes (e.g. +10 minutes) after earthquake origin time.	Earthquake Origin Time: 0000	
	Agency(ies) / Department(s):	Time (mins):
Strong and/or long duration earthquake is felt (vary depending distance from source)		+
Tsunami message received from tsunami service provider (NTWCs)		+
Call in staff		+
Activate emergency centers / Notify public safety agencies		+
Coordinate sounding of public sirens and alarm notifications		+
Initiate media notifications and evacuation announcements		+
Initiate evacuation of people away from coast (Tsunami Evacuation Maps)		+
Put boats/ships out to sea if wave impact time permits		+
Setup road-blocks and evacuation routes		+
Guide people through traffic points to shelter		+
Initiate recall of disaster response workers		+
Open and operate refuge centers		+
Prepare to start electrical generators		+
If your facility is located in a tsunami evacuation zone: -Prepare to shutoff utilities (e.g. electrical, gas, water) -Protect key equipment (e.g. computers) -Remove key documents (e.g. financial, personal information)		+
Determine if tsunami has caused coastal damage / injuries and the need to initiate search and rescue operations		+
Determine when to declare the “all clear”		+
Prepare for post tsunami impact operations		+
Do roll call for workers ___ and volunteers		+

Annex B. Example Table Top Exercise

Tabletop Exercise Development Steps

EVENT	TIME (WHEN)	ACTIVITY (WHAT INFO)	AUTHORITY (WHO)	MEDIUM (HOW)	TO (TARGET)
EQ Occurs					
Tsunami might come					
Evacuate					
Tsunami comes					
Safe to return					

Original 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 in 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.

Annex C. Tsunami Source Scenario Description

Costa Rica Earthquake Scenario

The scenario consists of a rupture of a fault segment along the Caribbean coast of Costa Rica, in the southern Caribbean Sea, with hypocenter at:

- Origin Time 14:00:00 UTC March 21, 2017
- Latitude 9.37°
- Longitude -82.54°
- Depth 25 km
- Magnitude 7.93 – Mw
- Slip 4.2 m
- Shear modulus: 35 GPa
- Seismic Moment: 9.92E+20 N-m

Segment 1

- Corner Point A
  - Latitude: 9.73°
  - Longitude: -83.12°
  - Depth: 25 km
- Corner Point B
  - Latitude: 10.05°
  - Longitude: -82.92°
  - Depth: 5 km
- Corner Point C
  - Latitude:9.33°
  - Longitude: -81.75°
  - Depth: 5 km
- Corner Point D
  - Latitude: 9.02°
  - Longitude: -81.96°
  - Depth: 25 km
- Strike: 122°
- Dip: 25°
- Rake: 90°
- Length: 150 km
- Width: 45 km
- Width Map View: 40.8 km

Cuba Earthquake Scenario

The scenario consists of a rupture of a fault segment along the southeastern coast of Cuba, in the northwestern portion of the Caribbean Sea, with hypocenter at:

- Origin Time 14:00:00 UTC March 21, 2017
- Latitude 19.625°
- Longitude -76.35°
- Depth 20 km
- Magnitude 8.24 – Mw
- Slip 8 m
- Shear modulus: 33.5 GPa
- Seismic Moment: 2.9E+21 N-m

Segment 1

- Corner Point A
  - Latitude: 19.77°
  - Longitude: -75.07°
  - Depth: 38.79 km
- Corner Point B
  - Latitude: 19.65°
  - Longitude: -75.06°
  - Depth: 1.21 km
- Corner Point C
  - Latitude: 19.48°
  - Longitude: -77.63°
  - Depth: 1.21 km
- Corner Point D
  - Latitude: 19.60°
  - Longitude: -77.64°
  - Depth: 38.79 km
- Strike: 266°
- Dip: 70°
- Rake: 90°
- Length: 270 km
- Width: 40 km
- Width Map View: 13.68 km

Northeastern Antilles Earthquake Scenario

The scenario consists of a rupture of a fault segment along the Northeastern Antilles, in the Southeastern portion of the Caribbean Sea, with hypocenter at:

- Origin Time 14:00:00 UTC March 21, 2017
- Latitude 16.96°
- Longitude -60.69°
- Depth 40km
- Magnitude 8.5 – Mw
- Slip 10 m
- Shear modulus: 50 GPa
- Seismic Moment: 7.16143E+21 N.m

Segment 1

- Corner Point A
  - Latitude: 17.52°
  - Longitude: -61.37°
  - Depth: 62 km
- Corner Point B
  - Latitude: 17.81°
  - Longitude: -61.15°
  - Depth: 15 km
- Corner Point C
  - Latitude: 16.4°
  - Longitude: 60°
  - Depth: 15 km
- Corner Point D
  - Latitude: 16.11°
  - Longitude: 60.23°
  - Depth: 62 km
- Strike: 325°
- Dip: 45°
- Rake: 90°
- Length: 220 km
- Width: 65 km
- Width Map View: 46 km

Tsunami models were computed using the Rapid Inundation Forecasting of Tsunamis (RIFT) model to generate expected impacts throughout the region.

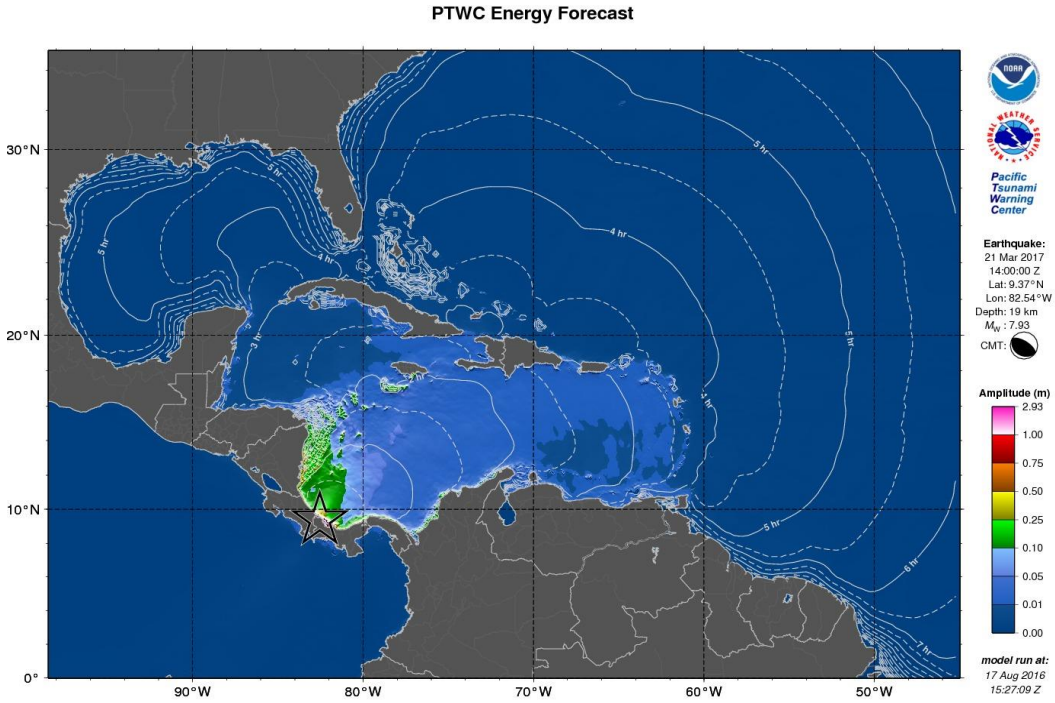


Figure C1. RIFT maximum amplitude map based on the scenario for Costa Rica. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

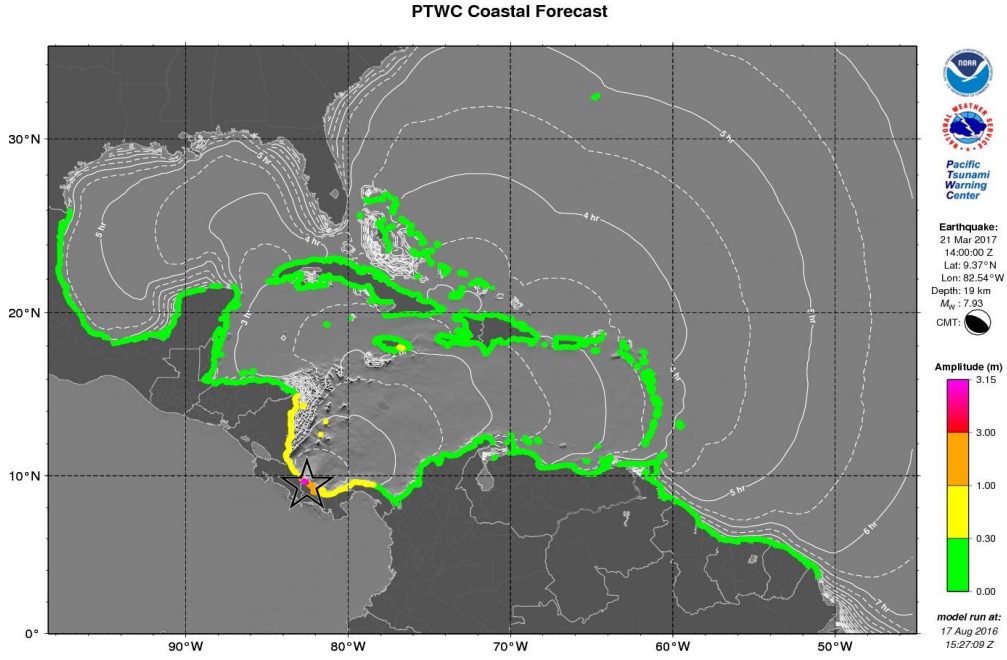


Figure C2. RIFT coastal tsunami amplitude map for the Costa Rica scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

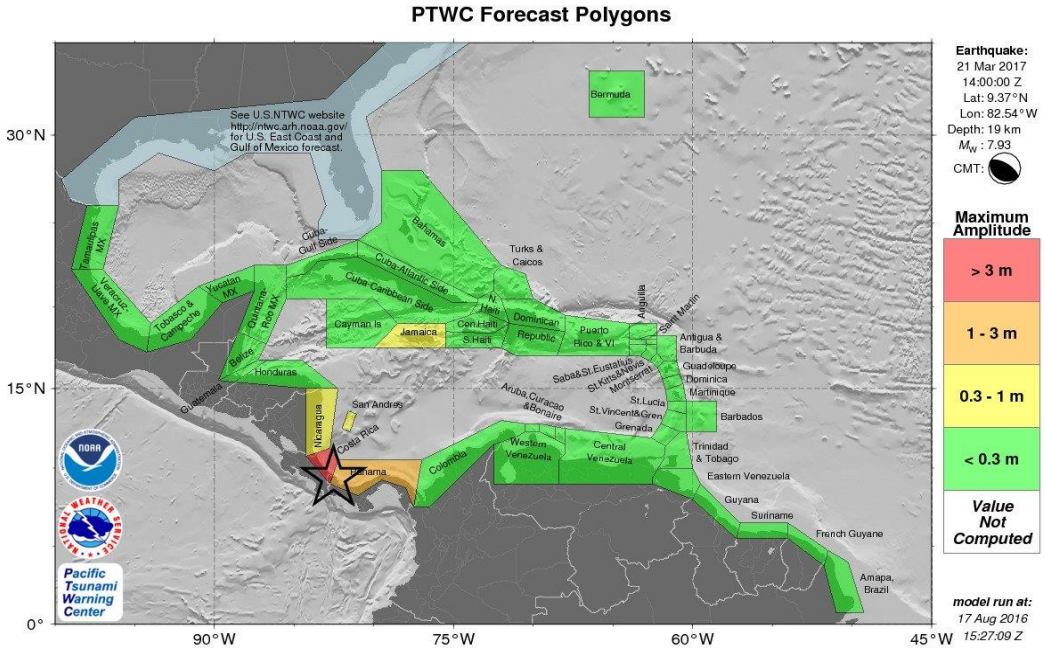


Figure C3. RIFT forecast polygons for the Caribbean region for the Costa Rica scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

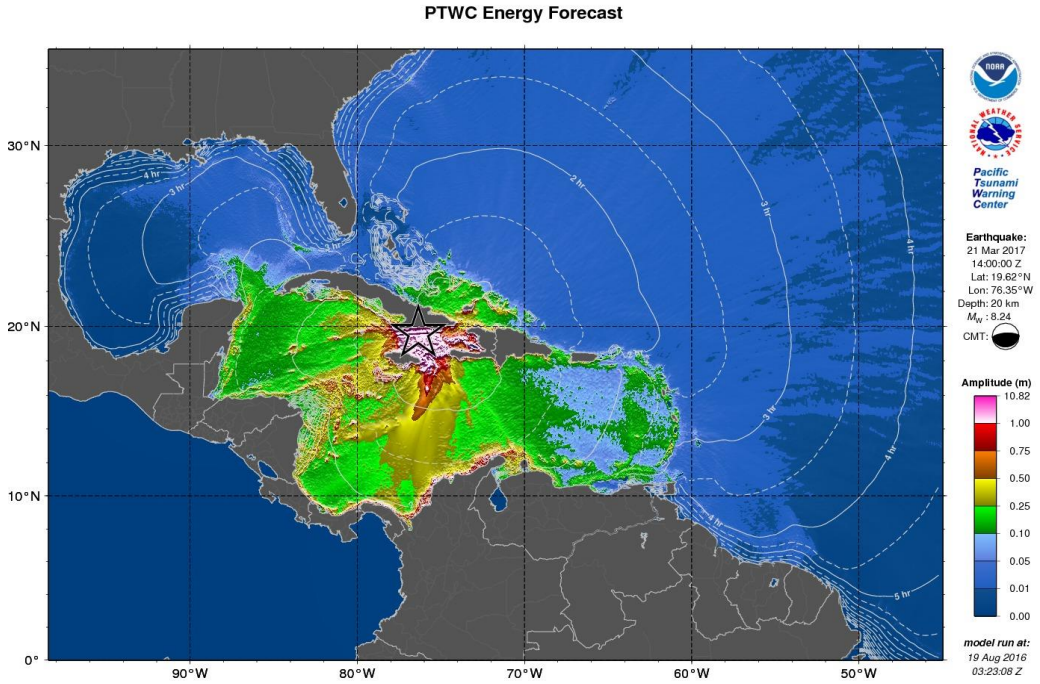


Figure C4. RIFT maximum amplitude map for the Cuba scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

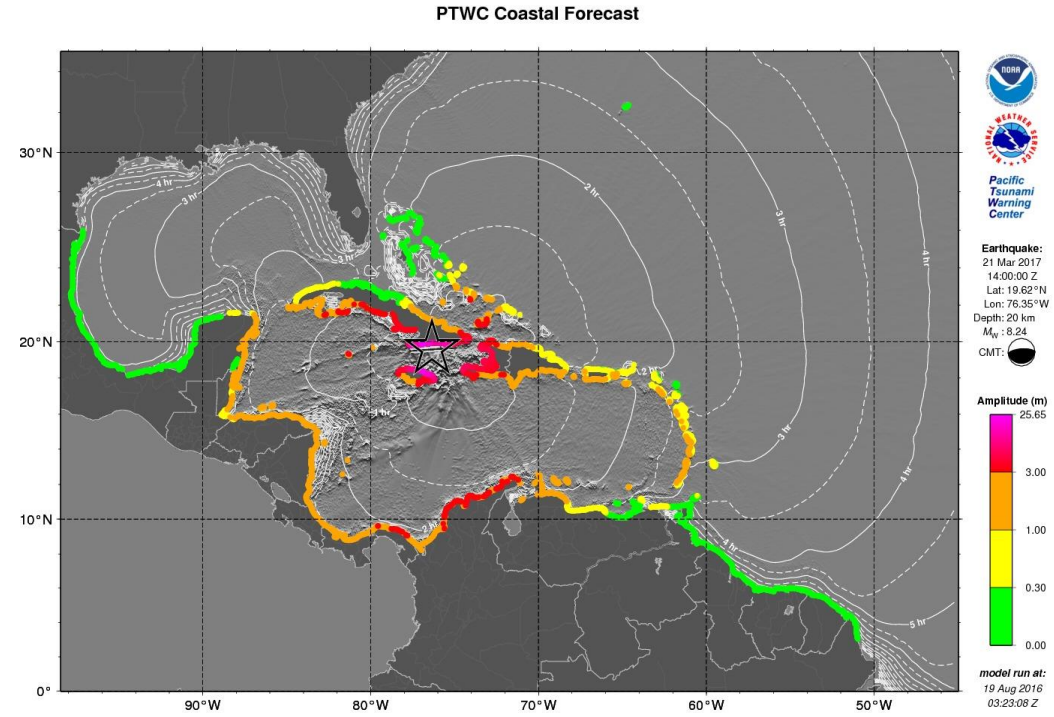


Figure C5. RIFT coastal tsunami amplitude map for the Cub scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami.

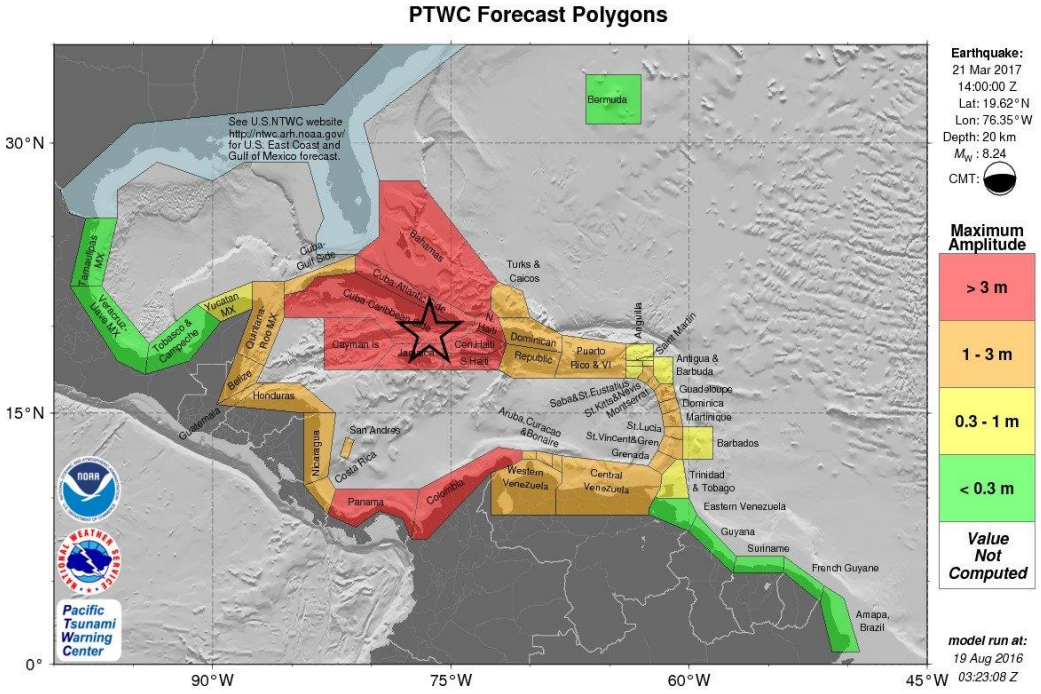


Figure C6. RIFT forecast polygons for the Caribbean region for the Cuba scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

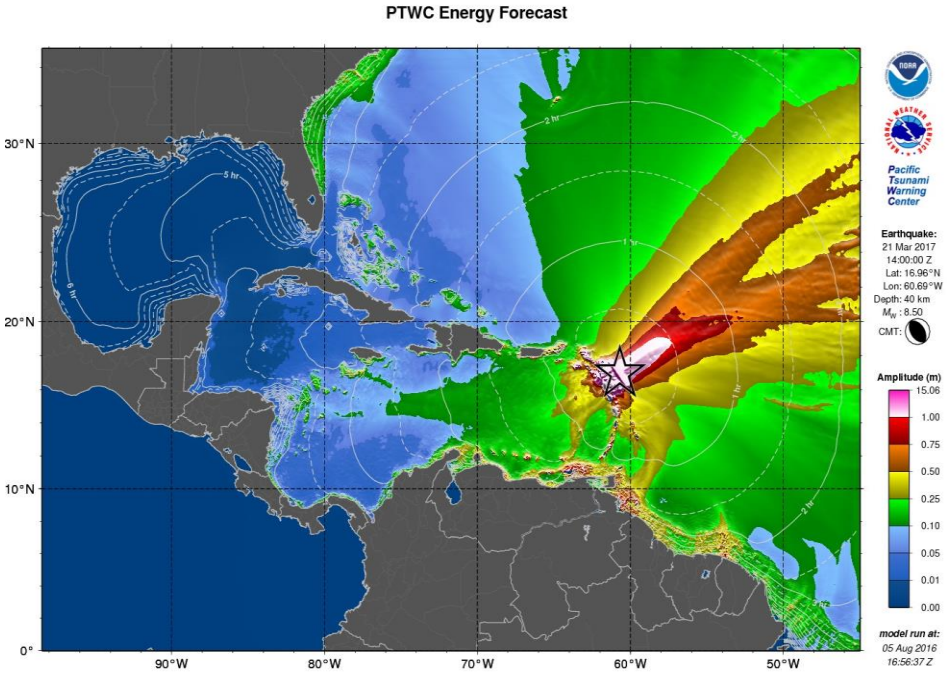


Figure C7. RIFT maximum amplitude map for the Northeastern Antilles scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

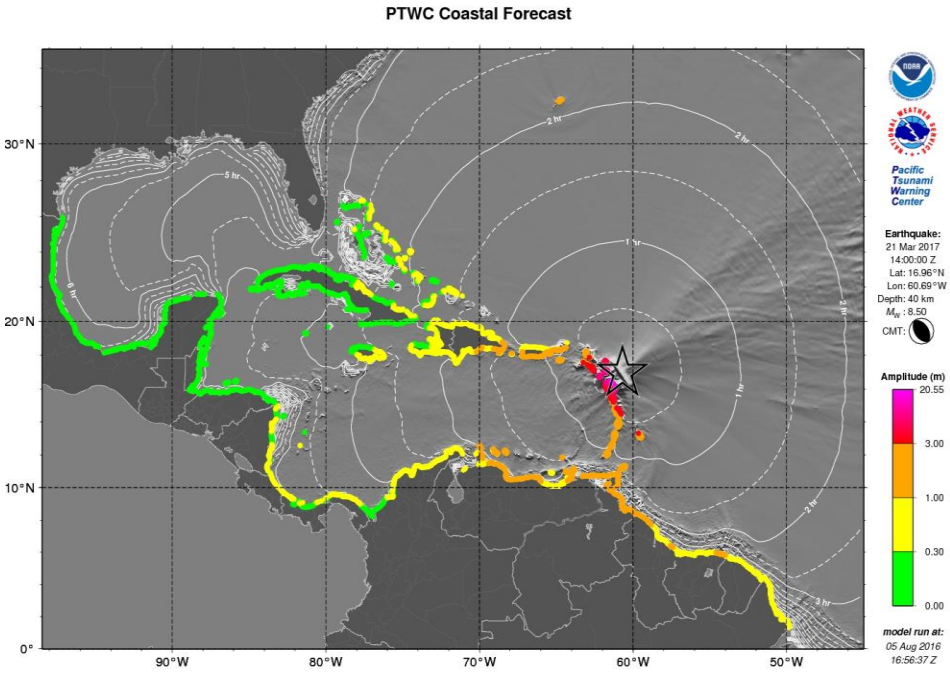


Figure C8. RIFT coastal tsunami amplitude map for the Northeastern Antilles scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami.

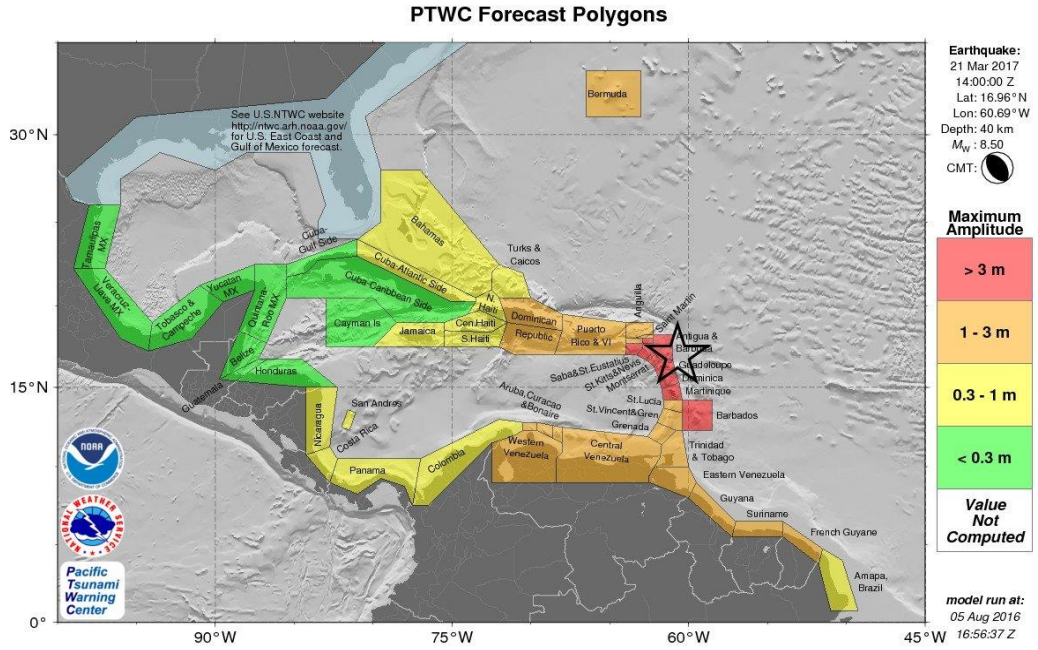


Figure C9. RIFT forecast polygons for the Northeastern Antilles scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

Annex D. Earthquake Impact Scenario

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

Earthquake Event

The input information for ShakeMap and PAGER are the four corners of the boxes from the fault plane and the depths at each of these four corners. For the case of Caribe Wave 17, the fault plane is represented by one segment for each of scenarios. The Costa Rica fault plane is 150 km long and 45 km wide. The Cuba fault plane is 270 km long and 40 km wide. The Northeastern Antilles fault plane is 220 km long and 65 km wide.

Figures D1, D2, D3, D4, D5, and D6, show ShakeMap and PAGER outputs for the Caribe Wave 17 earthquake scenarios.

For the Costa Rica the ShakeMap show intensities up to VIII on the Mercalli Modified Scale (Figure D1). The strongest ground shaking is predicted Limon, and the coast of Costa Rica and the intensity decreases further inland. According to the ShakeMap for the Cuba scenario (Figure D3), intensities of up to VII on the Mercalli Modified Scale could be observed. The strongest ground shaking is predicted near Santiago de Cuba and the South coast of Cuba. Moreover, the Northeastern Antilles ShakeMap shows intensities up to VI on the Mercalli Modified Scale (Figure D5). The strongest ground shaking is predicted for Antigua and Barbuda and Guadeloupe.

According to PAGER, (Figure D2, D4 and D6) the Caribe Wave 17 simulated earthquakes would produce earthquake shaking red alert for the Costa Rica and Cuba scenarios, while a yellow alert for the Northeastern Lesser Antilles scenario. For the Costa Rica scenario, while the fatalities are estimated to be significant, extensive economic losses could be expected. For the Cuba scenario, both extensive fatalities and economic losses are estimated for the southern coast of Cuba. In the case of the Northeastern Antilles scenario, some casualties and economic losses could be expected, mostly in Antigua and Barbuda and Guadeloupe.

Regarding population exposed to earthquake shaking, it is estimated that almost 225,000 people for Costa Rica scenario, almost 3 million people for Cuba scenario and 173,000 people for the Northeastern Antilles would be exposed to Modified Mercalli intensities from VI up to VIII.

Costa Rica Earthquake Scenario

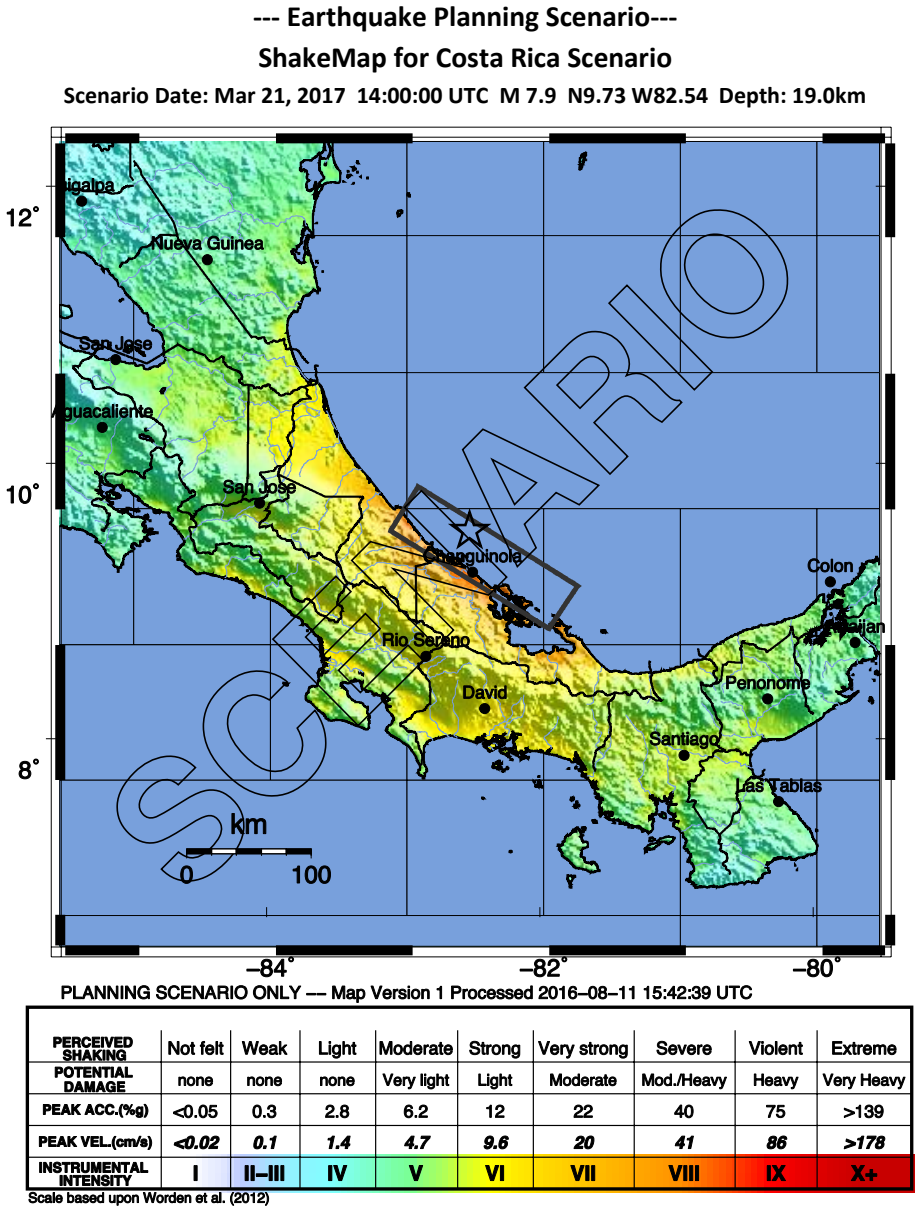


Figure D1. Shake map output for the CARIBE WAVE 17 Costa Rica earthquake scenario.

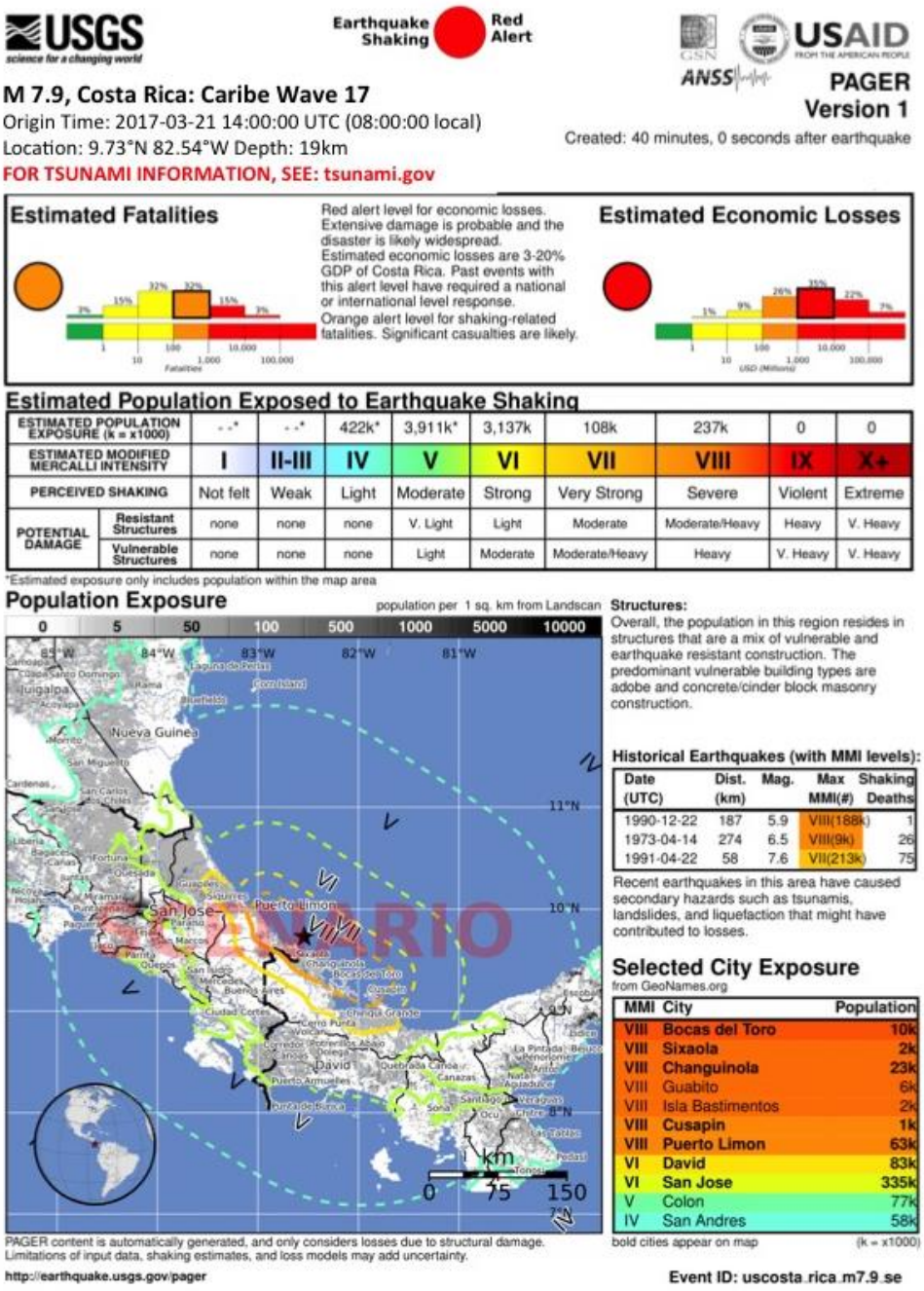
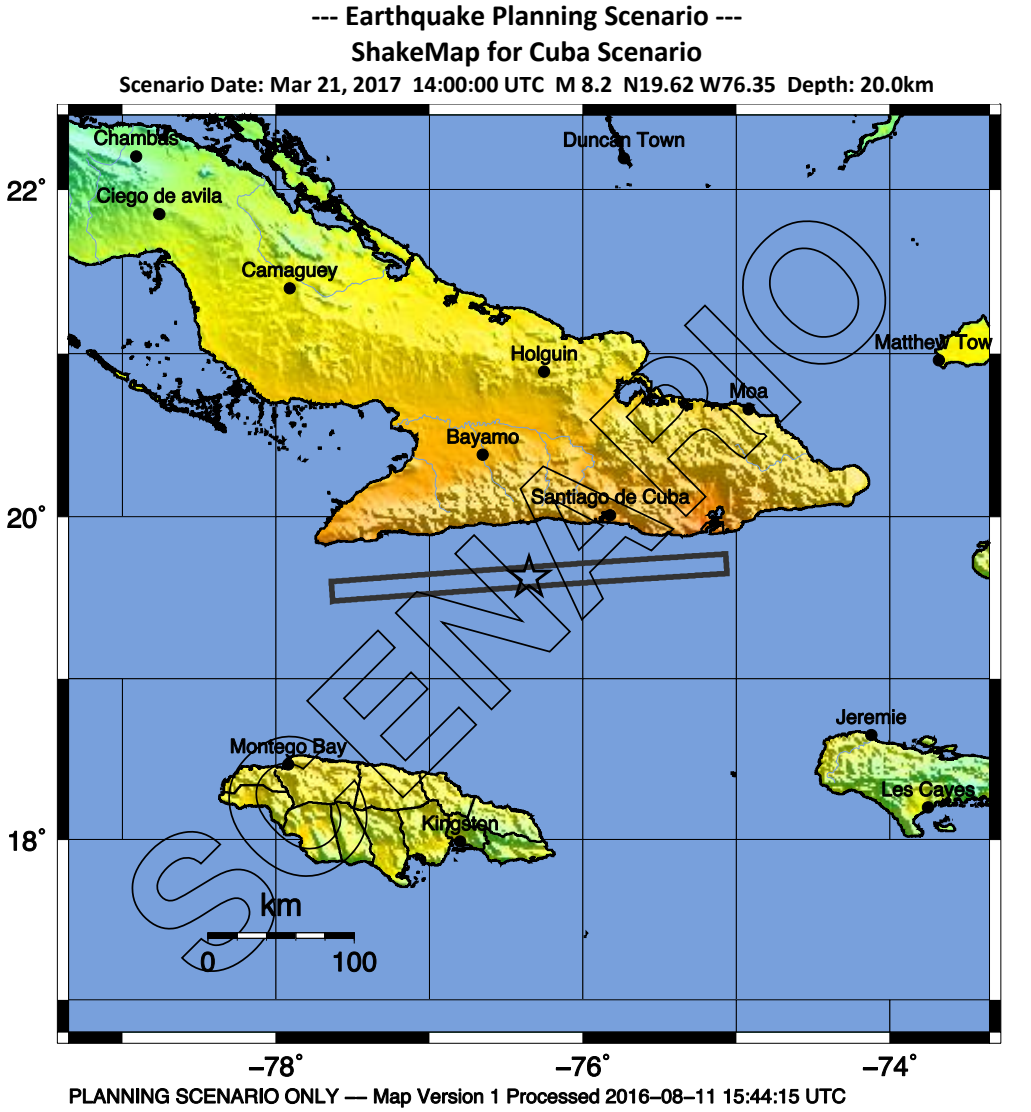


Figure D2. PAGER output for CARIBE WAVE 17 Costa Rica earthquake scenario (USGS).

Cuba Earthquake Scenario



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

Figure D3. Shake map output for the CARIBE WAVE 17 Cuba earthquake scenario.

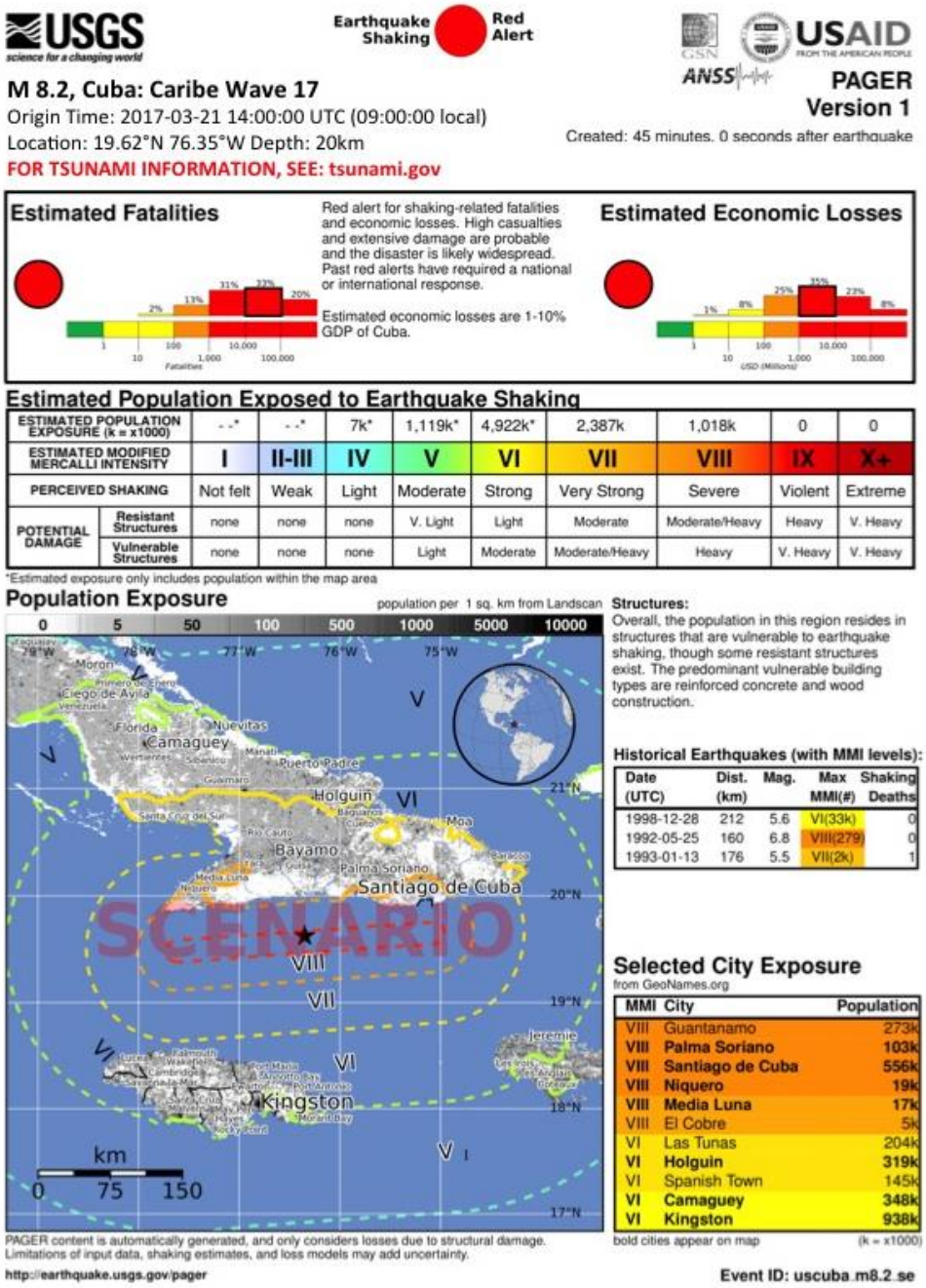
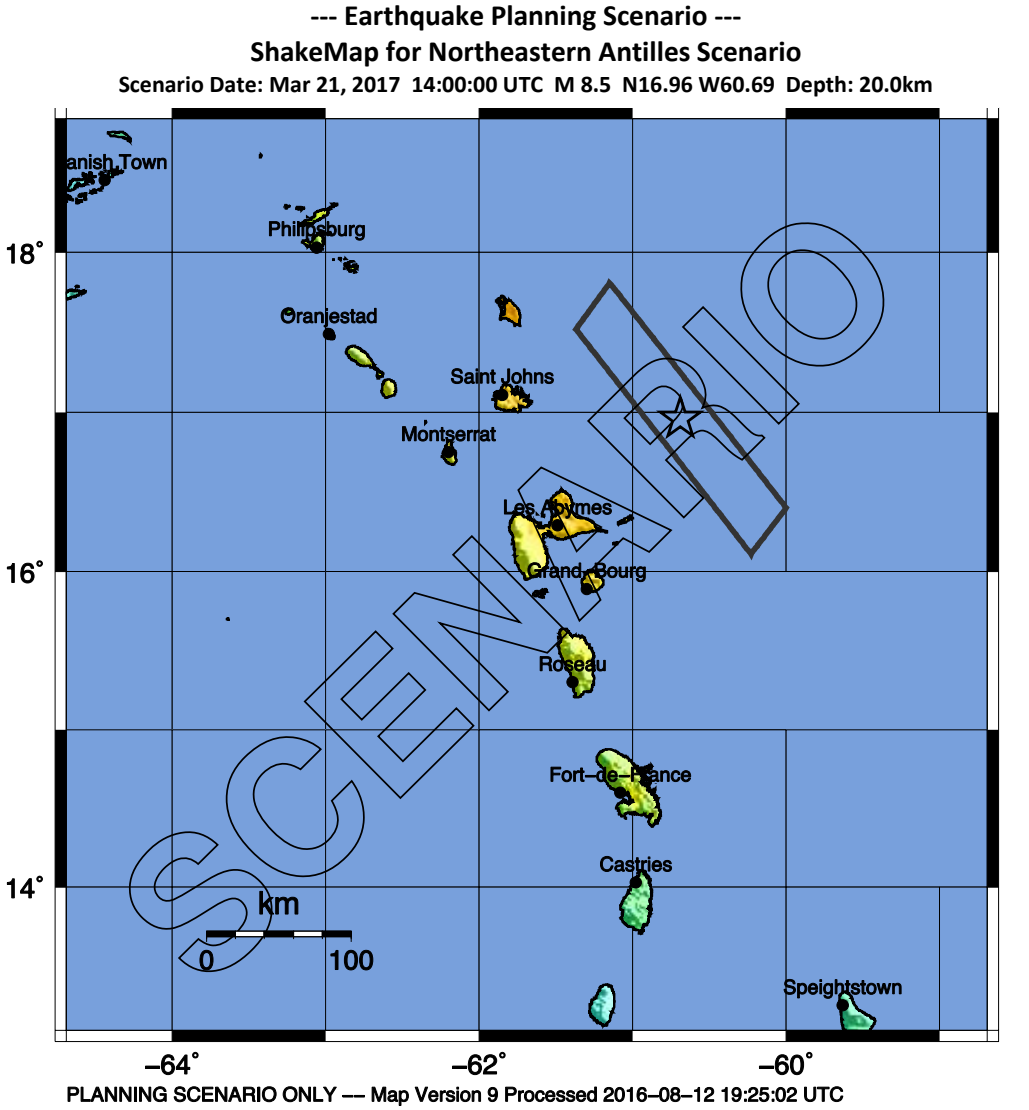


Figure D4. PAGER output for CARIBE WAVE 17 Cuba earthquake scenario (USGS).

Northeastern Antilles earthquake Scenario



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Mod./Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<0.05	0.3	2.8	6.2	12	22	40	75	>139
PEAK VEL.(cm/s)	*<0.02*	*0.1*	*1.4*	*4.7*	*9.6*	*20*	*41*	*86*	*>178*
INSTRUMENTAL INTENSITY	I	II–III	IV	V	VI	VII	VIII	IX	X+

Scale based upon Worden et al. (2012)

Figure D5. Shake map output for the CARIBE WAVE 17 Northeastern Antilles earthquake scenario.

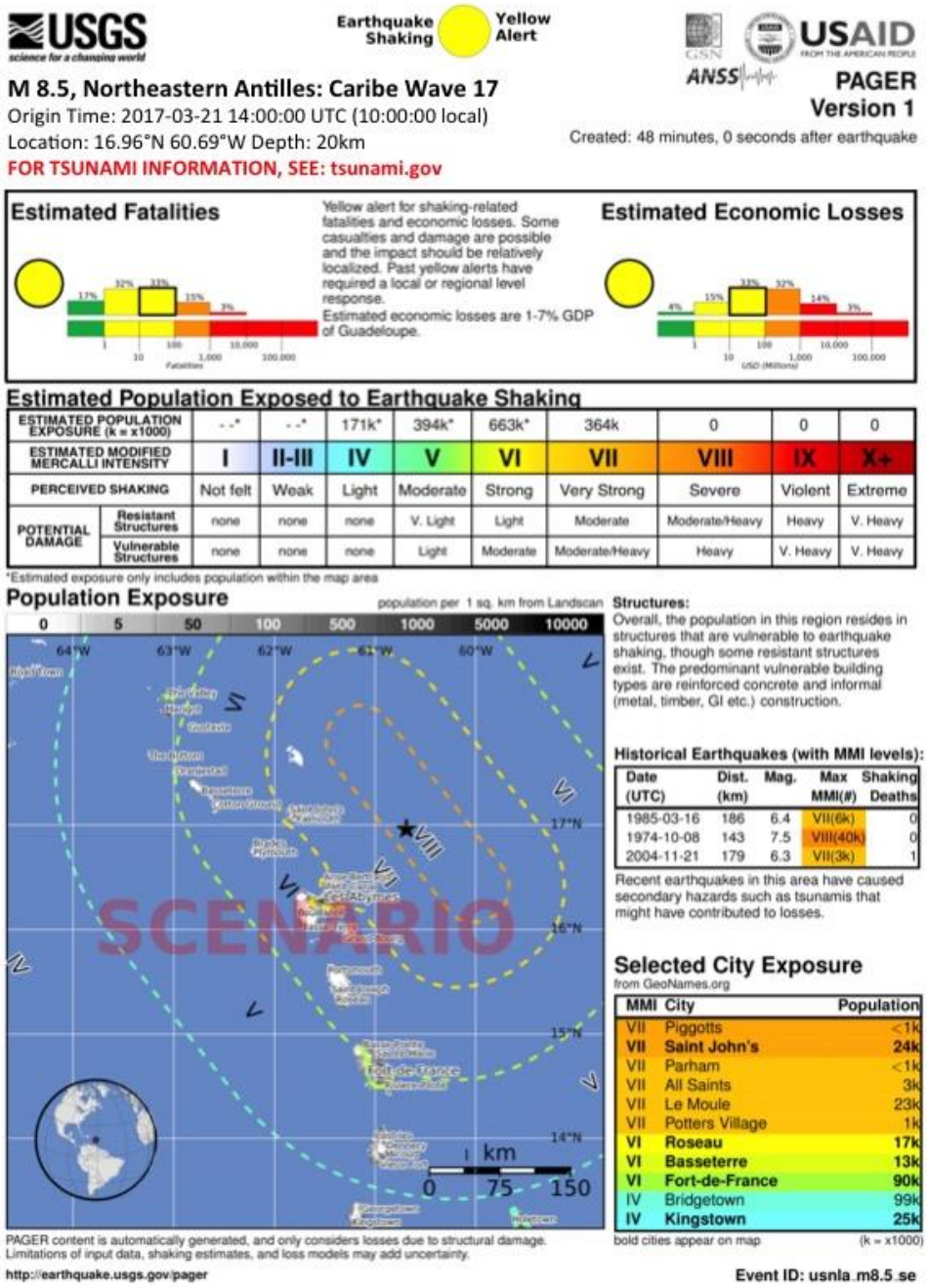


Figure D6. PAGER output for CARIBE WAVE 17 Northeastern Antilles earthquake scenario (USGS).

Annex E. TWC Dummy (Start of Exercise) Messages

PTWC

```
WECA41 PHEB 211400
TSUCAX

TEST...TSUNAMI EXERCISE MESSAGE NUMBER 1...TEST
NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS
ISSUED AT 1400Z 21 MAR 2017

...CARIBEWAVE 17 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 CARIBEWAVE 17 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 CARIBEWAVE.INFO. 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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Annex F. TWC Exercise Messages

Costa Rica Earthquake Scenario

The following messages created for the CARIBE WAVE 17 tsunami exercise are representative of the official standard products issued by the PTWC during a large magnitude 7.93 earthquake and tsunami originating in Costa Rica. During a real event, NTWC and TWFP would be sent via email the graphical products. The alerts would persist longer during a real event than is depicted in this exercise.

PTWC Message #1

```
ZCZC

WECA41 PHEB 211405
TSUCAX

TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1405 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****


PRELIMINARY EARTHQUAKE PARAMETERS
---------------------------------

  * MAGNITUDE      8.1
  * ORIGIN TIME    1400 UTC MAR 21 2017
  * COORDINATES    9.4 NORTH  82.5 WEST
  * DEPTH          19 KM / 12 MILES
  * LOCATION       PANAMA-COSTA RICA BORDER REGION

EVALUATION
----------

  * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.1 OCCURRED IN
    THE PANAMA-COSTA RICA BORDER REGION AT 1400 UTC ON TUESDAY
    MARCH 21 2017.

  * BASED ON THE PRELIMINARY EARTHQUAKE PARAMETERS... WIDESPREAD
    HAZARDOUS TSUNAMI WAVES ARE POSSIBLE.
TSUNAMI THREAT FORECAST
---------------------------------

  * HAZARDOUS TSUNAMI WAVES FROM THIS EARTHQUAKE ARE POSSIBLE
    WITHIN THE NEXT THREE HOURS ALONG SOME COASTS OF

      COSTA RICA... PANAMA... SAN ANDRES PROVID... COLOMBIA...
      NICARAGUA... HAITI... CAYMAN ISLANDS... ARUBA...
      JAMAICA... CUBA... BONAIRE... DOMINICAN REP... BAHAMAS...
      CURACAO AND PUERTO RICO



RECOMMENDED ACTIONS
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* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THE REGION IDENTIFIED WITH A POTENTIAL TSUNAMI THREAT. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1420 03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1431 03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1445 03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1456 03/21
ALIGANDI	PANAMA	9.2N	78.0W	1507 03/21
COLON	PANAMA	9.4N	79.9W	1507 03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1521 03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1524 03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1526 03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1535 03/21
SANTA MARTA	COLOMBIA	11.2N	74.2W	1541 03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1542 03/21
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1556 03/21
JACAMEL	HAITI	18.1N	72.5W	1610 03/21
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1616 03/21
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1624 03/21
ORANJESTAD	ARUBA	12.5N	70.0W	1625 03/21
KINGSTON	JAMAICA	17.9N	76.9W	1627 03/21
JEREMIE	HAITI	18.6N	74.1W	1627 03/21
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1627 03/21
RIOHACHA	COLOMBIA	11.6N	72.9W	1631 03/21
ONIMA	BONAIRE	12.3N	68.3W	1635 03/21
MONTEGO BAY	JAMAICA	18.5N	77.9W	1640 03/21
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1640 03/21
CIENFUEGOS	CUBA	22.0N	80.5W	1644 03/21
BARACOA	CUBA	20.4N	74.5W	1650 03/21
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1656 03/21
WILLEMSTAD	CURACAO	12.1N	68.9W	1700 03/21
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1700 03/21
CAP HAITEN	HAITI	19.8N	72.2W	1701 03/21

POTENTIAL IMPACTS

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  * A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS
    CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST
    FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

  * IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO
    THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION
    OF THE SHORELINE.

  * IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT
    THE TIME OF THE MAXIMUM TSUNAMI WAVES.

  * PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE
    CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.



NEXT UPDATE AND ADDITIONAL INFORMATION
--------------------------------------

  * THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF
    THE SITUATION WARRANTS.

  * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.
    GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT
    EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

  * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT
    PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.
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NNNN
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PTWC Message #2

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ZCZC
WECA41 PHEB 211425
TSUCAX

TSUNAMI MESSAGE NUMBER 2
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1425 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
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THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
---

* MAGNITUDE 7.9
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 9.4 NORTH 82.5 WEST
* DEPTH 19 KM / 12 MILES
* LOCATION PANAMA-COSTA RICA BORDER REGION

EVALUATION
---

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 7.9 OCCURRED IN THE PANAMA-COSTA RICA BORDER REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST...UPDATED
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  COSTA RICA.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  PANAMA.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  NICARAGUA... JAMAICA... AND SAN ANDRES AND PROVIDENCIA.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
PUERTO LIMON	COSTA RICA	10.0N 83.0W	1420 03/21
BOCAS DEL TORO	PANAMA	9.4N 82.2W	1431 03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N 81.7W	1445 03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N 81.4W	1456 03/21
ALIGANDI	PANAMA	9.2N 78.0W	1507 03/21
COLON	PANAMA	9.4N 79.9W	1507 03/21
PUERTO CARRETO	PANAMA	8.8N 77.6W	1521 03/21
PUNTA GORDA	NICARAGUA	11.4N 83.8W	1526 03/21
PUERTO OBALDIA	PANAMA	8.7N 77.4W	1535 03/21
KINGSTON	JAMAICA	17.9N 76.9W	1627 03/21
MONTEGO BAY	JAMAICA	18.5N 77.9W	1640 03/21
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	1941 03/21

POTENTIAL IMPACTS
---

* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

NEXT UPDATE AND ADDITIONAL INFORMATION

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  * THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF
    THE SITUATION WARRANTS.

  * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.
    GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT
    EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

  * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT
    PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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NNNN
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PTWC Message #3

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ZCZC
WECA41 PHEB 211525
TSUCAX

TSUNAMI MESSAGE NUMBER 3
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1525 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****


PRELIMINARY EARTHQUAKE PARAMETERS
---------------------------------

  * MAGNITUDE      7.9
  * ORIGIN TIME    1400 UTC MAR 21 2017
  * COORDINATES    9.4 NORTH  82.5 WEST
```

  * DEPTH   19 KM / 12 MILES
  * LOCATION   PANAMA-COSTA RICA BORDER REGION

EVALUATION
----

  * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 7.9 OCCURRED IN THE PANAMA-COSTA RICA BORDER REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

  * TSUNAMI WAVES HAVE BEEN OBSERVED.

  * BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
----

  * TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

      COSTA RICA.

  * TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

      PANAMA.

  * TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

      NICARAGUA... JAMAICA... AND SAN ANDRES AND PROVIDENCIA.

  * ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

  * FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
----

  * GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

  * PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1431 03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1445 03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1456 03/21
ALIGANDI	PANAMA	9.2N	78.0W	1507 03/21
COLON	PANAMA	9.4N	79.9W	1507 03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1521 03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1526 03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1535 03/21
KINGSTON	JAMAICA	17.9N	76.9W	1627 03/21
MONTEGO BAY	JAMAICA	18.5N	77.9W	1640 03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	1941 03/21

POTENTIAL IMPACTS

* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
EL PORVENIR PA	9.6N	78.9W	1505	0.38M/ 1.2FT	24
SAN ANDRES CO	12.6N	81.7W	1455	0.48M/ 1.6FT	22
BOCAS DEL TORO PA	9.4N	82.3W	1436	1.73M/ 5.7FT	16
LIMON CR	10.0N	83.0W	1425	0.91M/ 3.0FT	16

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NEXT UPDATE AND ADDITIONAL INFORMATION
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  * THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF
    THE SITUATION WARRANTS.

  * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.
    GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT
    EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

  * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT
    PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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NNNN
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PTWC Message #4

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ZCZC
WECA41 PHEB 211625
TSUCAX

TSUNAMI MESSAGE NUMBER 4
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1625 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****


PRELIMINARY EARTHQUAKE PARAMETERS
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  * MAGNITUDE      7.9
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* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 9.4 NORTH 82.5 WEST
* DEPTH 19 KM / 12 MILES
* LOCATION PANAMA-COSTA RICA BORDER REGION

EVALUATION
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* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 7.9 OCCURRED IN THE PANAMA-COSTA RICA BORDER REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  COSTA RICA.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  PANAMA.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  NICARAGUA... JAMAICA... AND SAN ANDRES AND PROVIDENCIA.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
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* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT

FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
PUNTA GORDA	NICARAGUA	11.4N 83.8W	1526 03/21
PUERTO OBALDIA	PANAMA	8.7N 77.4W	1535 03/21
KINGSTON	JAMAICA	17.9N 76.9W	1627 03/21
MONTEGO BAY	JAMAICA	18.5N 77.9W	1640 03/21
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	1941 03/21

POTENTIAL IMPACTS

* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
JACMEL HT	18.2N	72.5W	1621	0.13M/ 0.4FT	16
SANTA MARTA CO	11.2N	74.2W	1551	0.24M/ 0.8FT	24
SAPZURRO CO	8.7N	77.4W	1549	0.27M/ 0.9FT	14
COVENAS CO	9.4N	76.2W	1549	0.22M/ 0.7FT	20
EL PORVENIR PA	9.6N	78.9W	1505	0.38M/ 1.2FT	24
SAN ANDRES CO	12.6N	81.7W	1455	0.48M/ 1.6FT	22
BOCAS DEL TORO PA	9.4N	82.3W	1436	1.73M/ 5.7FT	16
LIMON CR	10.0N	83.0W	1425	0.91M/ 3.0FT	16

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NEXT UPDATE AND ADDITIONAL INFORMATION
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  * THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF
    THE SITUATION WARRANTS.

  * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.
    GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT
    EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

  * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT
    PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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PTWC Message #5

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ZCZC
WECA41 PHEB 211725
TSUCAX

TSUNAMI MESSAGE NUMBER 5
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1725 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

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 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
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 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****


PRELIMINARY EARTHQUAKE PARAMETERS
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  * MAGNITUDE      7.9
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  * ORIGIN TIME   1400 UTC MAR 21 2017
  * COORDINATES   9.4 NORTH 82.5 WEST
  * DEPTH   19 KM / 12 MILES
  * LOCATION   PANAMA-COSTA RICA BORDER REGION

EVALUATION
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  * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 7.9 OCCURRED IN THE PANAMA-COSTA RICA BORDER REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

  * TSUNAMI WAVES HAVE BEEN OBSERVED.

  * BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
----

  * TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

      COSTA RICA.

  * TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

      PANAMA.

  * TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

      NICARAGUA... JAMAICA... AND SAN ANDRES AND PROVIDENCIA.

  * ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

  * FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
----

  * GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

  * PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT

FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
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* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
KINGSTON	JAMAICA	17.9N 76.9W	1627 03/21
MONTEGO BAY	JAMAICA	18.5N 77.9W	1640 03/21
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	1941 03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

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* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
ARECIBO PR	18.5N	66.7W	1722	0.04M/ 0.1FT	14
ESPERANZA VIEQUES P	18.1N	65.5W	1721	0.08M/ 0.3FT	28
LIMETREE VI	17.7N	64.8W	1716	0.09M/ 0.3FT	28
ST CROIX VI	17.7N	64.7W	1713	0.08M/ 0.3FT	22
UTILA ISLAND HN	16.1N	86.9W	1715	0.04M/ 0.1FT	16
AGUADILLA PR	18.5N	67.2W	1716	0.07M/ 0.2FT	28
CAJA DE MUERTOS PR	17.9N	66.5W	1719	0.11M/ 0.4FT	22
PORT SAN ANDRES DO	18.4N	69.6W	1718	0.13M/ 0.4FT	28
YABUCOA PR	18.1N	65.8W	1711	0.10M/ 0.3FT	16
MAGUEYES ISLAND PR	18.0N	67.0W	1712	0.09M/ 0.3FT	18

CAP HAITIEN HT	19.8N	72.2W	1709	0.04M/ 0.1FT	20
MAYAGUEZ PR	18.2N	67.2W	1706	0.08M/ 0.3FT	24
ROATAN ISLAND HN	16.3N	86.5W	1707	0.04M/ 0.1FT	26
PUNTA CANA DO	18.5N	68.4W	1703	0.09M/ 0.3FT	18
MONA ISLAND PR	18.1N	67.9W	1657	0.09M/ 0.3FT	26
BULLEN BAY CURACAO	12.2N	69.0W	1639	0.06M/ 0.2FT	26
BARAHONA DO	18.2N	71.1W	1646	0.13M/ 0.4FT	26
PORT ROYAL JM	17.9N	76.8W	1638	0.33M/ 1.1FT	20
PUERTO ESTRELLA CO	12.4N	71.3W	1640	0.16M/ 0.5FT	22
GEORGE TOWN CY	19.3N	81.4W	1633	0.04M/ 0.1FT	22
JACMEL HT	18.2N	72.5W	1621	0.13M/ 0.4FT	16
SANTA MARTA CO	11.2N	74.2W	1551	0.24M/ 0.8FT	24
SAPZURRO CO	8.7N	77.4W	1549	0.27M/ 0.9FT	14
COVENAS CO	9.4N	76.2W	1549	0.22M/ 0.7FT	20
EL PORVENIR PA	9.6N	78.9W	1505	0.38M/ 1.2FT	24
SAN ANDRES CO	12.6N	81.7W	1455	0.48M/ 1.6FT	22
BOCAS DEL TORO PA	9.4N	82.3W	1436	1.73M/ 5.7FT	16
LIMON CR	10.0N	83.0W	1425	0.91M/ 3.0FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
---

* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

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NNNN

PTWC Message #6

ZCZC
WECA41 PHEB 211825
TSUCAX

TSUNAMI MESSAGE NUMBER 6
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1825 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

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**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS

* MAGNITUDE 7.9
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 9.4 NORTH 82.5 WEST
* DEPTH 19 KM / 12 MILES
* LOCATION PANAMA-COSTA RICA BORDER REGION

EVALUATION

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 7.9 OCCURRED IN THE PANAMA-COSTA RICA BORDER REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  COSTA RICA.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  PANAMA.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  NICARAGUA... JAMAICA... AND SAN ANDRES AND PROVIDENCIA.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST

AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

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ESTIMATED TIMES OF ARRIVAL
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LOCATION	REGION	COORDINATES	ETA(UTC)
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	1941 03/21

POTENTIAL IMPACTS
---

* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

GAUGE LOCATION	GAUGE COORDINATES LAT	LON	TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
SAINT MARTIN FR	18.1N	63.1W	1803	0.06M/ 0.2FT	28
PRICKLEY BAY GD	12.0N	61.8W	1803	0.07M/ 0.2FT	18
POINT A PITRE GP	16.2N	61.5W	1757	0.05M/ 0.2FT	14
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1752	0.07M/ 0.2FT	18
CALLIAQUA VC	13.1N	61.2W	1750	0.06M/ 0.2FT	24
PUERTO MORELOS MX	21.4N	86.8W	1753	0.04M/ 0.1FT	26
FORT DE FRANCE MQ	14.6N	61.1W	1755	0.06M/ 0.2FT	22
ISLA MUJERES	21.2N	86.7W	1751	0.05M/ 0.2FT	22
ROSEAU DM	15.3N	61.4W	1746	0.07M/ 0.2FT	26
LE PRECHEUR MARTINI	14.8N	61.2W	1744	0.05M/ 0.2FT	16
DESHAIES GUADELOUPE	16.3N	61.8W	1744	0.07M/ 0.2FT	22
BASSETERRE KN	17.3N	62.7W	1740	0.05M/ 0.2FT	26
CEIBA CABOTAGE HN	15.8N	86.8W	1740	0.04M/ 0.1FT	22
PORT AU PRINCE HT	18.5N	72.4W	1737	0.14M/ 0.5FT	18
CARRIE BOW CAY BH	16.8N	88.1W	1731	0.06M/ 0.2FT	28
PUERTO CORTES HN	15.8N	88.0W	1732	0.04M/ 0.1FT	24
ARECIBO PR	18.5N	66.7W	1722	0.04M/ 0.1FT	14
PUERTO MORELOS MX	20.9N	86.9W	1727	0.05M/ 0.2FT	26
ESPERANZA VIEQUES P	18.1N	65.5W	1721	0.08M/ 0.3FT	28
LIMETREE VI	17.7N	64.8W	1716	0.09M/ 0.3FT	28
ST CROIX VI	17.7N	64.7W	1713	0.08M/ 0.3FT	22
UTILA ISLAND HN	16.1N	86.9W	1715	0.04M/ 0.1FT	16
AGUADILLA PR	18.5N	67.2W	1716	0.07M/ 0.2FT	28
CAJA DE MUERTOS PR	17.9N	66.5W	1719	0.11M/ 0.4FT	22
PORT SAN ANDRES DO	18.4N	69.6W	1718	0.13M/ 0.4FT	28
YABUCOA PR	18.1N	65.8W	1711	0.10M/ 0.3FT	16
MAGUEYES ISLAND PR	18.0N	67.0W	1712	0.09M/ 0.3FT	18
CAP HAITIEN HT	19.8N	72.2W	1709	0.04M/ 0.1FT	20
MAYAGUEZ PR	18.2N	67.2W	1706	0.08M/ 0.3FT	24
ROATAN ISLAND HN	16.3N	86.5W	1707	0.04M/ 0.1FT	26
PUNTA CANA DO	18.5N	68.4W	1703	0.09M/ 0.3FT	18
MONA ISLAND PR	18.1N	67.9W	1657	0.09M/ 0.3FT	26
BULLEN BAY CURACAO	12.2N	69.0W	1639	0.06M/ 0.2FT	26
BARAHONA DO	18.2N	71.1W	1646	0.13M/ 0.4FT	26
PORT ROYAL JM	17.9N	76.8W	1638	0.33M/ 1.1FT	20
PUERTO ESTRELLA CO	12.4N	71.3W	1640	0.16M/ 0.5FT	22
GEORGE TOWN CY	19.3N	81.4W	1633	0.04M/ 0.1FT	22
JACMEL HT	18.2N	72.5W	1621	0.13M/ 0.4FT	16
SANTA MARTA CO	11.2N	74.2W	1551	0.24M/ 0.8FT	24
SAPZURRO CO	8.7N	77.4W	1549	0.27M/ 0.9FT	14
COVENAS CO	9.4N	76.2W	1549	0.22M/ 0.7FT	20
EL PORVENIR PA	9.6N	78.9W	1505	0.38M/ 1.2FT	24
SAN ANDRES CO	12.6N	81.7W	1455	0.48M/ 1.6FT	22
BOCAS DEL TORO PA	9.4N	82.3W	1436	1.73M/ 5.7FT	16
LIMON CR	10.0N	83.0W	1425	0.91M/ 3.0FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
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* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

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  * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.
    GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT
    EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

  * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT
    PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.
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NNNN
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PTWC Message #7

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ZCZC
WECA41 PHEB 211925
TSUCAX

TSUNAMI MESSAGE NUMBER 7
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1925 UTC TUE MAR 21 2017

...FINAL TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****


PRELIMINARY EARTHQUAKE PARAMETERS
---------------------------------

  * MAGNITUDE      7.9
  * ORIGIN TIME    1400 UTC MAR 21 2017
  * COORDINATES    9.4 NORTH  82.5 WEST
  * DEPTH          19 KM / 12 MILES
  * LOCATION       PANAMA-COSTA RICA BORDER REGION
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EVALUATION
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  * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 7.9 OCCURRED IN
    THE PANAMA-COSTA RICA BORDER REGION AT 1400 UTC ON TUESDAY
    MARCH 21 2017.

  * BASED ON ALL AVAILABLE DATA... THE TSUNAMI THREAT FROM THIS
    EARTHQUAKE HAS PASSED AND THERE IS NO FURTHER THREAT.

TSUNAMI THREAT FORECAST...UPDATED
----

  * THE TSUNAMI THREAT HAS NOW LARGELY PASSED.

RECOMMENDED ACTIONS
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  * GOVERNMENT AGENCIES RESPONSIBLE FOR ANY IMPACTED COASTAL
    AREAS SHOULD MONITOR CONDITIONS AT THE COAST TO DETERMINE IF
    AND WHEN IT IS SAFE TO RESUME NORMAL ACTIVITIES.

  * PERSONS LOCATED NEAR IMPACTED COASTAL AREAS SHOULD STAY ALERT
    FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM LOCAL
    AUTHORITIES.

  * REMAIN OBSERVANT AND EXERCISE NORMAL CAUTION NEAR THE SEA.

POTENTIAL IMPACTS
----

  * MINOR SEA LEVEL FLUCTUATIONS OF UP TO 1 FOOT ABOVE AND BELOW
    THE NORMAL TIDE MAY CONTINUE OVER THE NEXT FEW HOURS.

NEXT UPDATE AND ADDITIONAL INFORMATION
----

  * THIS WILL BE THE FINAL STATEMENT ISSUED FOR THIS EVENT UNLESS
    NEW INFORMATION IS RECEIVED OR THE SITUATION CHANGES.

  * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.
    GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT
    EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

  * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT
    PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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NNNN

Cuba Earthquake Scenario

The following messages created for the CARIBE WAVE 17 tsunami exercise are representative of the official standard products issued by the PTWC during a large magnitude 8.24 earthquake and tsunami originating in southeastern coast of Cuba. During a real event, the TWCs would also issue graphical and html-based products to their web sites and via RSS. The alerts would persist longer during a real event than is depicted in this exercise.

PTWC Message #1

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ZCZC
WECA41 PHEB 211405
TSUCAX

TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1405 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****


PRELIMINARY EARTHQUAKE PARAMETERS
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  * MAGNITUDE      8.0
  * ORIGIN TIME    1400 UTC MAR 21 2017
  * COORDINATES    19.6 NORTH  76.4 WEST
  * DEPTH          20 KM / 12 MILES
  * LOCATION       CUBA REGION


EVALUATION
----------

  * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.0 OCCURRED IN
    THE CUBA REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

  * BASED ON THE PRELIMINARY EARTHQUAKE PARAMETERS... WIDESPREAD
    HAZARDOUS TSUNAMI WAVES ARE POSSIBLE.

TSUNAMI THREAT FORECAST
---------------------------------

  * HAZARDOUS TSUNAMI WAVES FROM THIS EARTHQUAKE ARE POSSIBLE
    WITHIN THE NEXT THREE HOURS ALONG SOME COASTS OF

      CUBA... HAITI... CAYMAN ISLANDS... JAMAICA... BAHAMAS...
      TURKS N CAICOS... DOMINICAN REP... PUERTO RICO...
      MEXICO... COLOMBIA... HONDURAS... ARUBA... BONAIRE... SAN
      ANDRES PROVID... US VIRGIN IS... BR VIRGIN IS... PANAMA...
      SABA... SINT MAARTEN... ANGUILLA... SINT EUSTATIUS...
      CURACAO... SAINT KITTS... MONTSERRAT... VENEZUELA... COSTA
      RICA... GUADELOUPE... BARBUDA... DOMINICA... SAINT
      MARTIN... BERMUDA... ANTIGUA... SAINT BARTHELEMY... SAINT
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LUCIA... MARTINIQUE... SAINT VINCENT... BELIZE... GRENADA AND BARBADOS

RECOMMENDED ACTIONS
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* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THE REGION IDENTIFIED WITH A POTENTIAL TSUNAMI THREAT. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1405 03/21
JEREMIE	HAITI	18.6N	74.1W	1425 03/21
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1429 03/21
BARACOA	CUBA	20.4N	74.5W	1435 03/21
MONTEGO BAY	JAMAICA	18.5N	77.9W	1441 03/21
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1441 03/21
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1445 03/21
CAP HAITEN	HAITI	19.8N	72.2W	1446 03/21
JACAMEL	HAITI	18.1N	72.5W	1450 03/21
WEST CAICOS	TURKS N CAICOS	21.7N	72.5W	1451 03/21
CIENFUEGOS	CUBA	22.0N	80.5W	1451 03/21
GIBARA	CUBA	21.1N	76.1W	1454 03/21
MAYAGUANA	BAHAMAS	22.3N	73.0W	1455 03/21
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1457 03/21
KINGSTON	JAMAICA	17.9N	76.9W	1504 03/21
GRAND TURK	TURKS N CAICOS	21.5N	71.1W	1506 03/21
LONG ISLAND	BAHAMAS	23.3N	75.1W	1514 03/21
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1515 03/21
EXUMA	BAHAMAS	23.6N	75.9W	1525 03/21
PORT AU PRINCE	HAITI	18.5N	72.4W	1527 03/21
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1528 03/21
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1529 03/21
CAT ISLAND	BAHAMAS	24.4N	75.5W	1533 03/21
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1535 03/21
SAN JUAN	PUERTO RICO	18.5N	66.1W	1537 03/21
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1537 03/21
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1541 03/21
COZUMEL	MEXICO	20.5N	87.0W	1543 03/21
SANTA MARTA	COLOMBIA	11.2N	74.2W	1546 03/21
PUERTO CORTES	HONDURAS	15.9N	88.0W	1547 03/21
ORANJESTAD	ARUBA	12.5N	70.0W	1547 03/21

ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1550	03/21
ONIMA	BONAIRE	12.3N	68.3W	1553	03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1553	03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1556	03/21
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1559	03/21
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1601	03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1602	03/21
NASSAU	BAHAMAS	25.1N	77.4W	1602	03/21
LA HABANA	CUBA	23.2N	82.4W	1607	03/21
ALIGANDI	PANAMA	9.2N	78.0W	1608	03/21
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1608	03/21
SABA	SABA	17.6N	63.2W	1610	03/21
FREEPORT	BAHAMAS	26.5N	78.8W	1614	03/21
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1616	03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1617	03/21
THE VALLEY	ANGUILLA	18.3N	63.1W	1617	03/21
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1618	03/21
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1619	03/21
WILLEMSTAD	CURACAO	12.1N	68.9W	1619	03/21
RIOHACHA	COLOMBIA	11.6N	72.9W	1622	03/21
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1624	03/21
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1625	03/21
BASSETERRE	SAINT KITTS	17.3N	62.7W	1625	03/21
BIMINI	BAHAMAS	25.8N	79.3W	1627	03/21
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1629	03/21
MAIQUETIA	VENEZUELA	10.6N	67.0W	1629	03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1629	03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1632	03/21
TRUJILLO	HONDURAS	15.9N	86.0W	1633	03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1634	03/21
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1634	03/21
PALMETTO POINT	BARBUDA	17.6N	61.9W	1637	03/21
ROSEAU	DOMINICA	15.3N	61.4W	1638	03/21
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1638	03/21
COLON	PANAMA	9.4N	79.9W	1639	03/21
RUTHS BAY	BERMUDA	32.4N	64.6W	1640	03/21
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1640	03/21
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1642	03/21
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1643	03/21
CASTRIES	SAINT LUCIA	14.0N	61.0W	1645	03/21
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1647	03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1649	03/21
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1650	03/21
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1654	03/21
BELIZE CITY	BELIZE	17.5N	88.2W	1656	03/21
CUMANA	VENEZUELA	10.5N	64.2W	1700	03/21
SAINT GEORGES	GRENADA	12.0N	61.8W	1703	03/21
BRIDGETOWN	BARBADOS	13.1N	59.6W	1703	03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

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  * IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT
    THE TIME OF THE MAXIMUM TSUNAMI WAVES.

  * PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE
    CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.


NEXT UPDATE AND ADDITIONAL INFORMATION
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  * THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF
    THE SITUATION WARRANTS.

  * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.
    GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT
    EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

  * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT
    PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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NNNN
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PTWC Message #2

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ZCZC
WECA41 PHEB 211425
TSUCAX

TSUNAMI MESSAGE NUMBER 2
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1425 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.
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**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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* MAGNITUDE 8.2
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 19.6 NORTH 76.4 WEST
* DEPTH 20 KM / 12 MILES
* LOCATION CUBA REGION

EVALUATION
---

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.2 OCCURRED IN THE CUBA REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST...UPDATED
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  COLOMBIA... CUBA... HAITI... PANAMA... BAHAMAS... CAYMAN ISLANDS... AND JAMAICA.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  BELIZE... COSTA RICA... DOMINICAN REPUBLIC... GUATEMALA... HONDURAS... MEXICO... NICARAGUA... VENEZUELA... ARUBA... BONAIRE... CURACAO... DOMINICA... GRENADA... GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND VIRGIN ISLANDS... SAINT KITTS AND NEVIS... SAINT LUCIA... SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  ANGUILLA... ANTIGUA AND BARBUDA... BARBADOS... SABA AND SAINT EUSTATIUS... SAINT BARTHELEMY... SINT MAARTEN... SAINT MARTIN... AND TRINIDAD AND TOBAGO.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1405 03/21
JEREMIE	HAITI	18.6N	74.1W	1425 03/21
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1429 03/21
BARACOA	CUBA	20.4N	74.5W	1435 03/21
MONTEGO BAY	JAMAICA	18.5N	77.9W	1441 03/21
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1441 03/21
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1445 03/21
CAP HAITEN	HAITI	19.8N	72.2W	1446 03/21
JACAMEL	HAITI	18.1N	72.5W	1450 03/21
WEST CAICOS	TURKS N CAICOS	21.7N	72.5W	1451 03/21
CIENFUEGOS	CUBA	22.0N	80.5W	1451 03/21
GIBARA	CUBA	21.1N	76.1W	1454 03/21
MAYAGUANA	BAHAMAS	22.3N	73.0W	1455 03/21
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1457 03/21
KINGSTON	JAMAICA	17.9N	76.9W	1504 03/21
GRAND TURK	TURKS N CAICOS	21.5N	71.1W	1506 03/21
LONG ISLAND	BAHAMAS	23.3N	75.1W	1514 03/21
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1515 03/21
EXUMA	BAHAMAS	23.6N	75.9W	1525 03/21
PORT AU PRINCE	HAITI	18.5N	72.4W	1527 03/21
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1528 03/21
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1529 03/21
CAT ISLAND	BAHAMAS	24.4N	75.5W	1533 03/21
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1535 03/21
SAN JUAN	PUERTO RICO	18.5N	66.1W	1537 03/21
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1537 03/21
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1541 03/21
COZUMEL	MEXICO	20.5N	87.0W	1543 03/21
SANTA MARTA	COLOMBIA	11.2N	74.2W	1546 03/21
PUERTO CORTES	HONDURAS	15.9N	88.0W	1547 03/21
ORANJESTAD	ARUBA	12.5N	70.0W	1547 03/21
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1550 03/21
ONIMA	BONAIRE	12.3N	68.3W	1553 03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1553 03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1556 03/21

CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1559	03/21
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1601	03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1602	03/21
NASSAU	BAHAMAS	25.1N	77.4W	1602	03/21
LA HABANA	CUBA	23.2N	82.4W	1607	03/21
ALIGANDI	PANAMA	9.2N	78.0W	1608	03/21
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1608	03/21
SABA	SABA	17.6N	63.2W	1610	03/21
FREEPORT	BAHAMAS	26.5N	78.8W	1614	03/21
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1616	03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1617	03/21
THE VALLEY	ANGUILLA	18.3N	63.1W	1617	03/21
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1618	03/21
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1619	03/21
WILLEMSTAD	CURACAO	12.1N	68.9W	1619	03/21
RIOHACHA	COLOMBIA	11.6N	72.9W	1622	03/21
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1624	03/21
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1625	03/21
BASSETERRE	SAINT KITTS	17.3N	62.7W	1625	03/21
BIMINI	BAHAMAS	25.8N	79.3W	1627	03/21
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1629	03/21
MAIQUETIA	VENEZUELA	10.6N	67.0W	1629	03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1629	03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1632	03/21
TRUJILLO	HONDURAS	15.9N	86.0W	1633	03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1634	03/21
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1634	03/21
PALMETTO POINT	BARBUDA	17.6N	61.9W	1637	03/21
ROSEAU	DOMINICA	15.3N	61.4W	1638	03/21
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1638	03/21
COLON	PANAMA	9.4N	79.9W	1639	03/21
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1640	03/21
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1642	03/21
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1643	03/21
CASTRIES	SAINT LUCIA	14.0N	61.0W	1645	03/21
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1647	03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1649	03/21
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1650	03/21
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1654	03/21
BELIZE CITY	BELIZE	17.5N	88.2W	1656	03/21
CUMANA	VENEZUELA	10.5N	64.2W	1700	03/21
SAINT GEORGES	GRENADA	12.0N	61.8W	1703	03/21
BRIDGETOWN	BARBADOS	13.1N	59.6W	1703	03/21
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1715	03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1722	03/21
PUERTO BARRIOS	GUATEMALA	15.7N	88.6W	1739	03/21
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1745	03/21
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1809	03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1817	03/21
NUEVA GERONA	CUBA	21.9N	82.8W	1853	03/21
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1908	03/21
PROGRESO	MEXICO	21.3N	89.7W	1928	03/21
PORLAMAR	VENEZUELA	10.9N	63.8W	2024	03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2036	03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS

CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

NEXT UPDATE AND ADDITIONAL INFORMATION
---

* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.
* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

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NNNN

PTWC Message #3

ZCZC
WECA41 PHEB 211525
TSUCAX

TSUNAMI MESSAGE NUMBER 3
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1525 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS

* MAGNITUDE 8.2
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 19.6 NORTH 76.4 WEST
* DEPTH 20 KM / 12 MILES
* LOCATION CUBA REGION

EVALUATION

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.2 OCCURRED IN THE CUBA REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  COLOMBIA... CUBA... HAITI... PANAMA... BAHAMAS... CAYMAN ISLANDS... AND JAMAICA.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  BELIZE... COSTA RICA... DOMINICAN REPUBLIC... GUATEMALA... HONDURAS... MEXICO... NICARAGUA... VENEZUELA... ARUBA... BONAIRE... CURACAO... DOMINICA... GRENADA... GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND VIRGIN ISLANDS... SAINT KITTS AND NEVIS... SAINT LUCIA... SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  ANGUILLA... ANTIGUA AND BARBUDA... BARBADOS... SABA AND SAINT EUSTATIUS... SAINT BARTHELEMY... SINT MAARTEN... SAINT MARTIN... AND TRINIDAD AND TOBAGO.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
JEREMIE	HAITI	18.6N	74.1W	1425 03/21
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1429 03/21
BARACOA	CUBA	20.4N	74.5W	1435 03/21
MONTEGO BAY	JAMAICA	18.5N	77.9W	1441 03/21
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1441 03/21
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1445 03/21
CAP HAITEN	HAITI	19.8N	72.2W	1446 03/21
JACAMEL	HAITI	18.1N	72.5W	1450 03/21
WEST CAICOS	TURKS N CAICOS	21.7N	72.5W	1451 03/21
CIENFUEGOS	CUBA	22.0N	80.5W	1451 03/21
GIBARA	CUBA	21.1N	76.1W	1454 03/21
MAYAGUANA	BAHAMAS	22.3N	73.0W	1455 03/21
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1457 03/21
KINGSTON	JAMAICA	17.9N	76.9W	1504 03/21
GRAND TURK	TURKS N CAICOS	21.5N	71.1W	1506 03/21
LONG ISLAND	BAHAMAS	23.3N	75.1W	1514 03/21
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1515 03/21
EXUMA	BAHAMAS	23.6N	75.9W	1525 03/21
PORT AU PRINCE	HAITI	18.5N	72.4W	1527 03/21
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1528 03/21
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1529 03/21
CAT ISLAND	BAHAMAS	24.4N	75.5W	1533 03/21
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1535 03/21
SAN JUAN	PUERTO RICO	18.5N	66.1W	1537 03/21
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1537 03/21
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1541 03/21
COZUMEL	MEXICO	20.5N	87.0W	1543 03/21
SANTA MARTA	COLOMBIA	11.2N	74.2W	1546 03/21
PUERTO CORTES	HONDURAS	15.9N	88.0W	1547 03/21
ORANJESTAD	ARUBA	12.5N	70.0W	1547 03/21
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1550 03/21
ONIMA	BONAIRE	12.3N	68.3W	1553 03/21

SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1553 03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1556 03/21
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1559 03/21
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1601 03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1602 03/21
NASSAU	BAHAMAS	25.1N	77.4W	1602 03/21
LA HABANA	CUBA	23.2N	82.4W	1607 03/21
ALIGANDI	PANAMA	9.2N	78.0W	1608 03/21
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1608 03/21
SABA	SABA	17.6N	63.2W	1610 03/21
FREEPORT	BAHAMAS	26.5N	78.8W	1614 03/21
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1616 03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1617 03/21
THE VALLEY	ANGUILLA	18.3N	63.1W	1617 03/21
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1618 03/21
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1619 03/21
WILLEMSTAD	CURACAO	12.1N	68.9W	1619 03/21
RIOHACHA	COLOMBIA	11.6N	72.9W	1622 03/21
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1624 03/21
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1625 03/21
BASSETERRE	SAINT KITTS	17.3N	62.7W	1625 03/21
BIMINI	BAHAMAS	25.8N	79.3W	1627 03/21
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1629 03/21
MAIQUETIA	VENEZUELA	10.6N	67.0W	1629 03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1629 03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1632 03/21
TRUJILLO	HONDURAS	15.9N	86.0W	1633 03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1634 03/21
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1634 03/21
PALMETTO POINT	BARBUDA	17.6N	61.9W	1637 03/21
ROSEAU	DOMINICA	15.3N	61.4W	1638 03/21
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1638 03/21
COLON	PANAMA	9.4N	79.9W	1639 03/21
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1640 03/21
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1642 03/21
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1643 03/21
CASTRIES	SAINT LUCIA	14.0N	61.0W	1645 03/21
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1647 03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1649 03/21
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1650 03/21
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1654 03/21
BELIZE CITY	BELIZE	17.5N	88.2W	1656 03/21
CUMANA	VENEZUELA	10.5N	64.2W	1700 03/21
SAINT GEORGES	GRENADA	12.0N	61.8W	1703 03/21
BRIDGETOWN	BARBADOS	13.1N	59.6W	1703 03/21
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1715 03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1722 03/21
PUERTO BARRIOS	GUATEMALA	15.7N	88.6W	1739 03/21
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1745 03/21
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1809 03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1817 03/21
NUEVA GERONA	CUBA	21.9N	82.8W	1853 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1908 03/21
PROGRESO	MEXICO	21.3N	89.7W	1928 03/21
PORLAMAR	VENEZUELA	10.9N	63.8W	2024 03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2036 03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

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* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
PORT ROYAL JM	17.9N	76.8W	1517	5.23M/17.2FT	14
PUERTO PLATA DO	19.8N	70.7W	1512	1.12M/ 3.7FT	20
JACMEL HT	18.2N	72.5W	1457	2.20M/ 7.2FT	24
CAP HAITIEN HT	19.8N	72.2W	1456	2.86M/ 9.4FT	22
GEORGE TOWN CY	19.3N	81.4W	1447	2.55M/ 8.4FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
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* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

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NNNN

PTWC Message #4

ZCZC
WECA41 PHEB 211625
TSUCAX

TSUNAMI MESSAGE NUMBER 4
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1625 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

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**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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* MAGNITUDE 8.2
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 19.6 NORTH 76.4 WEST
* DEPTH 20 KM / 12 MILES
* LOCATION CUBA REGION

EVALUATION
---

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.2 OCCURRED IN THE CUBA REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  COLOMBIA... CUBA... HAITI... PANAMA... BAHAMAS... CAYMAN ISLANDS... AND JAMAICA.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  BELIZE... COSTA RICA... DOMINICAN REPUBLIC... GUATEMALA... HONDURAS... MEXICO... NICARAGUA... VENEZUELA... ARUBA...

BONAIRE... CURACAO... DOMINICA... GRENADA... GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND VIRGIN ISLANDS... SAINT KITTS AND NEVIS... SAINT LUCIA... SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

ANGUILLA... ANTIGUA AND BARBUDA... BARBADOS... SABA AND SAINT EUSTATIUS... SAINT BARTHELEMY... SINT MAARTEN... SAINT MARTIN... AND TRINIDAD AND TOBAGO.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
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* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.
* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
EXUMA	BAHAMAS	23.6N	75.9W	1525 03/21
PORT AU PRINCE	HAITI	18.5N	72.4W	1527 03/21
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1528 03/21
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1529 03/21
CAT ISLAND	BAHAMAS	24.4N	75.5W	1533 03/21
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1535 03/21
SAN JUAN	PUERTO RICO	18.5N	66.1W	1537 03/21
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1537 03/21
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1541 03/21
COZUMEL	MEXICO	20.5N	87.0W	1543 03/21
SANTA MARTA	COLOMBIA	11.2N	74.2W	1546 03/21
PUERTO CORTES	HONDURAS	15.9N	88.0W	1547 03/21
ORANJESTAD	ARUBA	12.5N	70.0W	1547 03/21

ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1550	03/21
ONIMA	BONAIRE	12.3N	68.3W	1553	03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1553	03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1556	03/21
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1559	03/21
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1601	03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1602	03/21
NASSAU	BAHAMAS	25.1N	77.4W	1602	03/21
LA HABANA	CUBA	23.2N	82.4W	1607	03/21
ALIGANDI	PANAMA	9.2N	78.0W	1608	03/21
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1608	03/21
SABA	SABA	17.6N	63.2W	1610	03/21
FREEPORT	BAHAMAS	26.5N	78.8W	1614	03/21
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1616	03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1617	03/21
THE VALLEY	ANGUILLA	18.3N	63.1W	1617	03/21
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1618	03/21
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1619	03/21
WILLEMSTAD	CURACAO	12.1N	68.9W	1619	03/21
RIOHACHA	COLOMBIA	11.6N	72.9W	1622	03/21
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1624	03/21
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1625	03/21
BASSETERRE	SAINT KITTS	17.3N	62.7W	1625	03/21
BIMINI	BAHAMAS	25.8N	79.3W	1627	03/21
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1629	03/21
MAIQUETIA	VENEZUELA	10.6N	67.0W	1629	03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1629	03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1632	03/21
TRUJILLO	HONDURAS	15.9N	86.0W	1633	03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1634	03/21
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1634	03/21
PALMETTO POINT	BARBUDA	17.6N	61.9W	1637	03/21
ROSEAU	DOMINICA	15.3N	61.4W	1638	03/21
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1638	03/21
COLON	PANAMA	9.4N	79.9W	1639	03/21
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1640	03/21
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1642	03/21
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1643	03/21
CASTRIES	SAINT LUCIA	14.0N	61.0W	1645	03/21
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1647	03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1649	03/21
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1650	03/21
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1654	03/21
BELIZE CITY	BELIZE	17.5N	88.2W	1656	03/21
CUMANA	VENEZUELA	10.5N	64.2W	1700	03/21
SAINT GEORGES	GRENADA	12.0N	61.8W	1703	03/21
BRIDGETOWN	BARBADOS	13.1N	59.6W	1703	03/21
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1715	03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1722	03/21
PUERTO BARRIOS	GUATEMALA	15.7N	88.6W	1739	03/21
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1745	03/21
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1809	03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1817	03/21
NUEVA GERONA	CUBA	21.9N	82.8W	1853	03/21
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1908	03/21
PROGRESO	MEXICO	21.3N	89.7W	1928	03/21
PORLAMAR	VENEZUELA	10.9N	63.8W	2024	03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2036	03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
EL PORVENIR PA	9.6N	78.9W	1623	2.36M/ 7.7FT	22
PUERTO MORELOS MX	21.4N	86.8W	1614	1.05M/ 3.5FT	26
ISLA MUJERES	21.2N	86.7W	1614	1.37M/ 4.5FT	22
SAN ANDRES CO	12.6N	81.7W	1610	1.84M/ 6.0FT	18
ESPERANZA VIEQUES P	18.1N	65.5W	1614	1.07M/ 3.5FT	28
LIMETREE VI	17.7N	64.8W	1613	1.16M/ 3.8FT	24
ST CROIX VI	17.7N	64.7W	1605	0.55M/ 1.8FT	14
CEIBA CABOTAGE HN	15.8N	86.8W	1611	1.04M/ 3.4FT	26
CAJA DE MUERTOS PR	17.9N	66.5W	1605	1.16M/ 3.8FT	28
PUERTO ESTRELLA CO	12.4N	71.3W	1602	2.93M/ 9.6FT	28
YABUCOA PR	18.1N	65.8W	1559	0.84M/ 2.8FT	22
BULLEN BAY CURACAO	12.2N	69.0W	1600	1.54M/ 5.1FT	16
MAGUEYES ISLAND PR	18.0N	67.0W	1600	1.21M/ 4.0FT	28
PORT SAN ANDRES DO	18.4N	69.6W	1606	1.86M/ 6.1FT	22
CARRIE BOW CAY BH	16.8N	88.1W	1601	1.16M/ 3.8FT	28
PUERTO CORTES HN	15.8N	88.0W	1555	1.56M/ 5.1FT	16
SANTA MARTA CO	11.2N	74.2W	1556	3.02M/ 9.9FT	18
PUERTO MORELOS MX	20.9N	86.9W	1546	1.74M/ 5.7FT	20
PUNTA CANA DO	18.5N	68.4W	1543	0.90M/ 3.0FT	24
SAN JUAN PR	18.5N	66.1W	1549	0.21M/ 0.7FT	26
AGUADILLA PR	18.5N	67.2W	1544	0.58M/ 1.9FT	18
UTILA ISLAND HN	16.1N	86.9W	1547	1.25M/ 4.1FT	26
MAYAGUEZ PR	18.2N	67.2W	1540	0.85M/ 2.8FT	26
ARECIBO PR	18.5N	66.7W	1549	0.33M/ 1.1FT	26
MONA ISLAND PR	18.1N	67.9W	1546	1.00M/ 3.3FT	20
DART 42407	15.3N	68.2W	1546	0.12M/ 0.4FT	22
PORT AU PRINCE HT	18.5N	72.4W	1539	5.37M/17.6FT	22
ROATAN ISLAND HN	16.3N	86.5W	1532	1.51M/ 5.0FT	16
BARAHONA DO	18.2N	71.1W	1530	1.51M/ 5.0FT	24

PORT ROYAL JM	17.9N	76.8W	1517	5.23M/17.2FT	14
PUERTO PLATA DO	19.8N	70.7W	1512	1.12M/ 3.7FT	20
JACMEL HT	18.2N	72.5W	1457	2.20M/ 7.2FT	24
CAP HAITIEN HT	19.8N	72.2W	1456	2.86M/ 9.4FT	22
GEORGE TOWN CY	19.3N	81.4W	1447	2.55M/ 8.4FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
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* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

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NNNN

PTWC Message #5

ZCZC
WECA41 PHEB 211725
TSUCAX

TSUNAMI MESSAGE NUMBER 5
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1725 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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* MAGNITUDE 8.2
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 19.6 NORTH 76.4 WEST
* DEPTH 20 KM / 12 MILES
* LOCATION CUBA REGION

EVALUATION
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* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.2 OCCURRED IN THE CUBA REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  COLOMBIA... CUBA... HAITI... PANAMA... BAHAMAS... CAYMAN ISLANDS... AND JAMAICA.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  BELIZE... COSTA RICA... DOMINICAN REPUBLIC... GUATEMALA... HONDURAS... MEXICO... NICARAGUA... VENEZUELA... ARUBA... BONAIRE... CURACAO... DOMINICA... GRENADA... GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND VIRGIN ISLANDS... SAINT KITTS AND NEVIS... SAINT LUCIA... SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  ANGUILLA... ANTIGUA AND BARBUDA... BARBADOS... SABA AND SAINT EUSTATIUS... SAINT BARTHELEMY... SINT MAARTEN... SAINT MARTIN... AND TRINIDAD AND TOBAGO.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
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* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
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* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1625 03/21
BASSETERRE	SAINT KITTS	17.3N	62.7W	1625 03/21
BIMINI	BAHAMAS	25.8N	79.3W	1627 03/21
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1629 03/21
MAIQUETIA	VENEZUELA	10.6N	67.0W	1629 03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1629 03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1632 03/21
TRUJILLO	HONDURAS	15.9N	86.0W	1633 03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1634 03/21
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1634 03/21
PALMETTO POINT	BARBUDA	17.6N	61.9W	1637 03/21
ROSEAU	DOMINICA	15.3N	61.4W	1638 03/21
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1638 03/21
COLON	PANAMA	9.4N	79.9W	1639 03/21
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1640 03/21
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1642 03/21
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1643 03/21
CASTRIES	SAINT LUCIA	14.0N	61.0W	1645 03/21
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1647 03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1649 03/21
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1650 03/21
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1654 03/21
BELIZE CITY	BELIZE	17.5N	88.2W	1656 03/21
CUMANA	VENEZUELA	10.5N	64.2W	1700 03/21
SAINT GEORGES	GRENADA	12.0N	61.8W	1703 03/21
BRIDGETOWN	BARBADOS	13.1N	59.6W	1703 03/21
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1715 03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1722 03/21
PUERTO BARRIOS	GUATEMALA	15.7N	88.6W	1739 03/21
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1745 03/21
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1809 03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1817 03/21
NUEVA GERONA	CUBA	21.9N	82.8W	1853 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1908 03/21
PROGRESO	MEXICO	21.3N	89.7W	1928 03/21
PORLAMAR	VENEZUELA	10.9N	63.8W	2024 03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2036 03/21

POTENTIAL IMPACTS
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TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
BRIDGEPORT BB	13.1N	59.6W	1717	0.47M/ 1.5FT	20
PRICKLEY BAY GD	12.0N	61.8W	1712	0.81M/ 2.7FT	18
PORT ST CHARLES BB	13.3N	59.6W	1712	0.45M/ 1.5FT	18
VIRGINIA KEY FL	25.7N	80.2W	1705	0.04M/ 0.1FT	24
CALLIAQUA VC	13.1N	61.2W	1701	1.36M/ 4.5FT	18
TELA HN	15.8N	87.5W	1704	1.03M/ 3.4FT	28
BOCAS DEL TORO PA	9.4N	82.3W	1659	1.89M/ 6.2FT	18
LE ROBERT MARTINIQU	14.7N	60.9W	1703	0.50M/ 1.6FT	20
FORT DE FRANCE MQ	14.6N	61.1W	1702	1.13M/ 3.7FT	22
BARBUDA AG	17.6N	61.8W	1658	0.20M/ 0.7FT	26
BERMUDA UK	32.4N	64.7W	1651	0.26M/ 0.8FT	22
LE PRECHEUR MARTINI	14.8N	61.2W	1646	0.91M/ 3.0FT	24
POINT A PITRE GP	16.2N	61.5W	1648	0.48M/ 1.6FT	28
ROSEAU DM	15.3N	61.4W	1653	0.96M/ 3.1FT	18
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1644	0.61M/ 2.0FT	14
DESHAIES GUADELOUPE	16.3N	61.8W	1640	0.82M/ 2.7FT	18
SAINT MARTIN FR	18.1N	63.1W	1639	0.67M/ 2.2FT	24
SAPZURRO CO	8.7N	77.4W	1641	2.45M/ 8.1FT	26
BASSETERRE KN	17.3N	62.7W	1638	0.50M/ 1.6FT	22
PARHAM AT	17.1N	61.8W	1634	0.27M/ 0.9FT	22
DESIRADE GUADELOUPE	16.3N	61.1W	1634	0.45M/ 1.5FT	26
COVENAS CO	9.4N	76.2W	1630	2.39M/ 7.9FT	16
EL PORVENIR PA	9.6N	78.9W	1623	2.36M/ 7.7FT	22
PUERTO MORELOS MX	21.4N	86.8W	1614	1.05M/ 3.5FT	26
ISLA MUJERES	21.2N	86.7W	1614	1.37M/ 4.5FT	22
SAN ANDRES CO	12.6N	81.7W	1610	1.84M/ 6.0FT	18
ESPERANZA VIEQUES P	18.1N	65.5W	1614	1.07M/ 3.5FT	28
LIMETREE VI	17.7N	64.8W	1613	1.16M/ 3.8FT	24
ST CROIX VI	17.7N	64.7W	1605	0.55M/ 1.8FT	14

CEIBA CABOTAGE HN	15.8N	86.8W	1611	1.04M/ 3.4FT	26
CAJA DE MUERTOS PR	17.9N	66.5W	1605	1.16M/ 3.8FT	28
PUERTO ESTRELLA CO	12.4N	71.3W	1602	2.93M/ 9.6FT	28
YABUCOA PR	18.1N	65.8W	1559	0.84M/ 2.8FT	22
BULLEN BAY CURACAO	12.2N	69.0W	1600	1.54M/ 5.1FT	16
MAGUEYES ISLAND PR	18.0N	67.0W	1600	1.21M/ 4.0FT	28
PORT SAN ANDRES DO	18.4N	69.6W	1606	1.86M/ 6.1FT	22
CARRIE BOW CAY BH	16.8N	88.1W	1601	1.16M/ 3.8FT	28
PUERTO CORTES HN	15.8N	88.0W	1555	1.56M/ 5.1FT	16
SANTA MARTA CO	11.2N	74.2W	1556	3.02M/ 9.9FT	18
PUERTO MORELOS MX	20.9N	86.9W	1546	1.74M/ 5.7FT	20
PUNTA CANA DO	18.5N	68.4W	1543	0.90M/ 3.0FT	24
SAN JUAN PR	18.5N	66.1W	1549	0.21M/ 0.7FT	26
AGUADILLA PR	18.5N	67.2W	1544	0.58M/ 1.9FT	18
UTILA ISLAND HN	16.1N	86.9W	1547	1.25M/ 4.1FT	26
MAYAGUEZ PR	18.2N	67.2W	1540	0.85M/ 2.8FT	26
ARECIBO PR	18.5N	66.7W	1549	0.33M/ 1.1FT	26
MONA ISLAND PR	18.1N	67.9W	1546	1.00M/ 3.3FT	20
DART 42407	15.3N	68.2W	1546	0.12M/ 0.4FT	22
PORT AU PRINCE HT	18.5N	72.4W	1539	5.37M/17.6FT	22
ROATAN ISLAND HN	16.3N	86.5W	1532	1.51M/ 5.0FT	16
BARAHONA DO	18.2N	71.1W	1530	1.51M/ 5.0FT	24
PORT ROYAL JM	17.9N	76.8W	1517	5.23M/17.2FT	14
PUERTO PLATA DO	19.8N	70.7W	1512	1.12M/ 3.7FT	20
JACMEL HT	18.2N	72.5W	1457	2.20M/ 7.2FT	24
CAP HAITIEN HT	19.8N	72.2W	1456	2.86M/ 9.4FT	22
GEORGE TOWN CY	19.3N	81.4W	1447	2.55M/ 8.4FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
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PTWC Message #6

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ZCZC
WECA41 PHEB 211825
TSUCAX

TSUNAMI MESSAGE NUMBER 6
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1825 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

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PRELIMINARY EARTHQUAKE PARAMETERS
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  * MAGNITUDE      8.2
  * ORIGIN TIME    1400 UTC MAR 21 2017
  * COORDINATES    19.6 NORTH  76.4 WEST
  * DEPTH          20 KM / 12 MILES
  * LOCATION       CUBA REGION

EVALUATION
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  * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.2 OCCURRED IN
    THE CUBA REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

  * TSUNAMI WAVES HAVE BEEN OBSERVED.

  * BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE
    FORECAST FOR SOME COASTS.
TSUNAMI THREAT FORECAST
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  * TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE
    LEVEL ARE POSSIBLE ALONG SOME COASTS OF

      COLOMBIA... CUBA... HAITI... PANAMA... BAHAMAS... CAYMAN
      ISLANDS... AND JAMAICA.

  * TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE
    POSSIBLE ALONG SOME COASTS OF

      BELIZE... COSTA RICA... DOMINICAN REPUBLIC... GUATEMALA...
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HONDURAS... MEXICO... NICARAGUA... VENEZUELA... ARUBA... BONAIRE... CURACAO... DOMINICA... GRENADA... GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND VIRGIN ISLANDS... SAINT KITTS AND NEVIS... SAINT LUCIA... SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

ANGUILLA... ANTIGUA AND BARBUDA... BARBADOS... SABA AND SAINT EUSTATIUS... SAINT BARTHELEMY... SINT MAARTEN... SAINT MARTIN... AND TRINIDAD AND TOBAGO.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
PUERTO BARRIOS	GUATEMALA	15.7N 88.6W	1739 03/21
PIRATES BAY	TRINIDAD TOBAGO	11.3N 60.6W	1745 03/21
PUNTO FIJO	VENEZUELA	11.7N 70.2W	1809 03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N 61.5W	1817 03/21
NUEVA GERONA	CUBA	21.9N 82.8W	1853 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N 71.2W	1908 03/21
PROGRESO	MEXICO	21.3N 89.7W	1928 03/21
PORLAMAR	VENEZUELA	10.9N 63.8W	2024 03/21
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	2036 03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
TRIDENT PIER FL	28.4N	80.6W	1819	0.10M/ 0.3FT	28
CHARLOTTEVILLE TT	11.3N	60.5W	1800	0.38M/ 1.2FT	24
SCARBOROUGH TT	11.2N	60.7W	1750	0.24M/ 0.8FT	20
PILOTS STATION LA	28.9N	89.4W	1734	0.17M/ 0.6FT	26
VACA KEY FL	24.7N	81.1W	1728	0.21M/ 0.7FT	20
TORTOLA VI UK	18.4N	64.6W	1736	0.64M/ 2.1FT	16
KEY WEST FL	24.6N	81.8W	1729	0.21M/ 0.7FT	20
BRIDGEPORT BB	13.1N	59.6W	1717	0.47M/ 1.5FT	20
PRICKLEY BAY GD	12.0N	61.8W	1712	0.81M/ 2.7FT	18
PORT ST CHARLES BB	13.3N	59.6W	1712	0.45M/ 1.5FT	18
VIRGINIA KEY FL	25.7N	80.2W	1705	0.04M/ 0.1FT	24
CALLIAQUA VC	13.1N	61.2W	1701	1.36M/ 4.5FT	18
TELA HN	15.8N	87.5W	1704	1.03M/ 3.4FT	28
BOCAS DEL TORO PA	9.4N	82.3W	1659	1.89M/ 6.2FT	18
LE ROBERT MARTINIQU	14.7N	60.9W	1703	0.50M/ 1.6FT	20
FORT DE FRANCE MQ	14.6N	61.1W	1702	1.13M/ 3.7FT	22
BARBUDA AG	17.6N	61.8W	1658	0.20M/ 0.7FT	26
BERMUDA UK	32.4N	64.7W	1651	0.26M/ 0.8FT	22
LE PRECHEUR MARTINI	14.8N	61.2W	1646	0.91M/ 3.0FT	24
POINT A PITRE GP	16.2N	61.5W	1648	0.48M/ 1.6FT	28
ROSEAU DM	15.3N	61.4W	1653	0.96M/ 3.1FT	18
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1644	0.61M/ 2.0FT	14
DESHAIES GUADELOUPE	16.3N	61.8W	1640	0.82M/ 2.7FT	18
SAINT MARTIN FR	18.1N	63.1W	1639	0.67M/ 2.2FT	24
SAPZURRO CO	8.7N	77.4W	1641	2.45M/ 8.1FT	26
BASSETERRE KN	17.3N	62.7W	1638	0.50M/ 1.6FT	22
PARHAM AT	17.1N	61.8W	1634	0.27M/ 0.9FT	22
DESIRADE GUADELOUPE	16.3N	61.1W	1634	0.45M/ 1.5FT	26
COVENAS CO	9.4N	76.2W	1630	2.39M/ 7.9FT	16
EL PORVENIR PA	9.6N	78.9W	1623	2.36M/ 7.7FT	22

PUERTO MORELOS MX	21.4N	86.8W	1614	1.05M/ 3.5FT	26
ISLA MUJERES	21.2N	86.7W	1614	1.37M/ 4.5FT	22
SAN ANDRES CO	12.6N	81.7W	1610	1.84M/ 6.0FT	18
ESPERANZA VIEQUES P	18.1N	65.5W	1614	1.07M/ 3.5FT	28
LIMETREE VI	17.7N	64.8W	1613	1.16M/ 3.8FT	24
ST CROIX VI	17.7N	64.7W	1605	0.55M/ 1.8FT	14
CEIBA CABOTAGE HN	15.8N	86.8W	1611	1.04M/ 3.4FT	26
CAJA DE MUERTOS PR	17.9N	66.5W	1605	1.16M/ 3.8FT	28
PUERTO ESTRELLA CO	12.4N	71.3W	1602	2.93M/ 9.6FT	28
YABUCOA PR	18.1N	65.8W	1559	0.84M/ 2.8FT	22
BULLEN BAY CURACAO	12.2N	69.0W	1600	1.54M/ 5.1FT	16
MAGUEYES ISLAND PR	18.0N	67.0W	1600	1.21M/ 4.0FT	28
PORT SAN ANDRES DO	18.4N	69.6W	1606	1.86M/ 6.1FT	22
CARRIE BOW CAY BH	16.8N	88.1W	1601	1.16M/ 3.8FT	28
PUERTO CORTES HN	15.8N	88.0W	1555	1.56M/ 5.1FT	16
SANTA MARTA CO	11.2N	74.2W	1556	3.02M/ 9.9FT	18
PUERTO MORELOS MX	20.9N	86.9W	1546	1.74M/ 5.7FT	20
PUNTA CANA DO	18.5N	68.4W	1543	0.90M/ 3.0FT	24
SAN JUAN PR	18.5N	66.1W	1549	0.21M/ 0.7FT	26
AGUADILLA PR	18.5N	67.2W	1544	0.58M/ 1.9FT	18
UTILA ISLAND HN	16.1N	86.9W	1547	1.25M/ 4.1FT	26
MAYAGUEZ PR	18.2N	67.2W	1540	0.85M/ 2.8FT	26
ARECIBO PR	18.5N	66.7W	1549	0.33M/ 1.1FT	26
MONA ISLAND PR	18.1N	67.9W	1546	1.00M/ 3.3FT	20
DART 42407	15.3N	68.2W	1546	0.12M/ 0.4FT	22
PORT AU PRINCE HT	18.5N	72.4W	1539	5.37M/17.6FT	22
ROATAN ISLAND HN	16.3N	86.5W	1532	1.51M/ 5.0FT	16
BARAHONA DO	18.2N	71.1W	1530	1.51M/ 5.0FT	24
PORT ROYAL JM	17.9N	76.8W	1517	5.23M/17.2FT	14
PUERTO PLATA DO	19.8N	70.7W	1512	1.12M/ 3.7FT	20
JACMEL HT	18.2N	72.5W	1457	2.20M/ 7.2FT	24
CAP HAITIEN HT	19.8N	72.2W	1456	2.86M/ 9.4FT	22
GEORGE TOWN CY	19.3N	81.4W	1447	2.55M/ 8.4FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
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* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

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NNNN

PTWC Message #7

ZCZC
WECA41 PHEB 211925
TSUCAX

TSUNAMI MESSAGE NUMBER 7
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1925 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

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PRELIMINARY EARTHQUAKE PARAMETERS
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* MAGNITUDE 8.2
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 19.6 NORTH 76.4 WEST
* DEPTH 20 KM / 12 MILES
* LOCATION CUBA REGION

EVALUATION
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* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

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  BELIZE... COSTA RICA... DOMINICAN REPUBLIC... GUATEMALA...

HONDURAS... MEXICO... NICARAGUA... VENEZUELA... ARUBA... BONAIRE... CURACAO... DOMINICA... GRENADA... GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND VIRGIN ISLANDS... SAINT KITTS AND NEVIS... SAINT LUCIA... SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

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LOCATION	REGION	COORDINATES	ETA(UTC)
NUEVA GERONA	CUBA	21.9N 82.8W	1853 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N 71.2W	1908 03/21
PROGRESO	MEXICO	21.3N 89.7W	1928 03/21
PORLAMAR	VENEZUELA	10.9N 63.8W	2024 03/21
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	2036 03/21

POTENTIAL IMPACTS
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TSUNAMI OBSERVATIONS

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GAUGE LOCATION	GAUGE COORDINATES LAT	LON	TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
DAUPHIN ISLAND AL	30.3N	88.1W	1858	0.06M/ 0.2FT	26
WRIGHT BEACH NC	34.2N	77.8W	1850	0.36M/ 1.2FT	28
GRAND ISLE LA	29.3N	90.0W	1832	0.11M/ 0.4FT	26
PORT OF SPAIN TT	10.6N	61.5W	1831	0.26M/ 0.9FT	22
TRIDENT PIER FL	28.4N	80.6W	1819	0.10M/ 0.3FT	28
CHARLOTTEVILLE TT	11.3N	60.5W	1800	0.38M/ 1.2FT	24
SCARBOROUGH TT	11.2N	60.7W	1750	0.24M/ 0.8FT	20
PILOTS STATION LA	28.9N	89.4W	1734	0.17M/ 0.6FT	26
VACA KEY FL	24.7N	81.1W	1728	0.21M/ 0.7FT	20
TORTOLA VI UK	18.4N	64.6W	1736	0.64M/ 2.1FT	16
KEY WEST FL	24.6N	81.8W	1729	0.21M/ 0.7FT	20
BRIDGEPORT BB	13.1N	59.6W	1717	0.47M/ 1.5FT	20
PRICKLEY BAY GD	12.0N	61.8W	1712	0.81M/ 2.7FT	18
PORT ST CHARLES BB	13.3N	59.6W	1712	0.45M/ 1.5FT	18
VIRGINIA KEY FL	25.7N	80.2W	1705	0.04M/ 0.1FT	24
CALLIAQUA VC	13.1N	61.2W	1701	1.36M/ 4.5FT	18
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SAN ANDRES CO	12.6N	81.7W	1610	1.84M/ 6.0FT	18
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MAGUEYES ISLAND PR	18.0N	67.0W	1600	1.21M/ 4.0FT	28
PORT SAN ANDRES DO	18.4N	69.6W	1606	1.86M/ 6.1FT	22
CARRIE BOW CAY BH	16.8N	88.1W	1601	1.16M/ 3.8FT	28
PUERTO CORTES HN	15.8N	88.0W	1555	1.56M/ 5.1FT	16
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PUERTO MORELOS MX	20.9N	86.9W	1546	1.74M/ 5.7FT	20
PUNTA CANA DO	18.5N	68.4W	1543	0.90M/ 3.0FT	24
SAN JUAN PR	18.5N	66.1W	1549	0.21M/ 0.7FT	26
AGUADILLA PR	18.5N	67.2W	1544	0.58M/ 1.9FT	18
UTILA ISLAND HN	16.1N	86.9W	1547	1.25M/ 4.1FT	26
MAYAGUEZ PR	18.2N	67.2W	1540	0.85M/ 2.8FT	26
ARECIBO PR	18.5N	66.7W	1549	0.33M/ 1.1FT	26
MONA ISLAND PR	18.1N	67.9W	1546	1.00M/ 3.3FT	20
DART 42407	15.3N	68.2W	1546	0.12M/ 0.4FT	22
PORT AU PRINCE HT	18.5N	72.4W	1539	5.37M/17.6FT	22
ROATAN ISLAND HN	16.3N	86.5W	1532	1.51M/ 5.0FT	16
BARAHONA DO	18.2N	71.1W	1530	1.51M/ 5.0FT	24
PORT ROYAL JM	17.9N	76.8W	1517	5.23M/17.2FT	14
PUERTO PLATA DO	19.8N	70.7W	1512	1.12M/ 3.7FT	20
JACMEL HT	18.2N	72.5W	1457	2.20M/ 7.2FT	24
CAP HAITIEN HT	19.8N	72.2W	1456	2.86M/ 9.4FT	22
GEORGE TOWN CY	19.3N	81.4W	1447	2.55M/ 8.4FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
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* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

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NNNN

PTWC Message #8

ZCZC
WECA41 PHEB 212025
TSUCAX

TSUNAMI MESSAGE NUMBER 8
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
2025 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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* MAGNITUDE 8.2
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 19.6 NORTH 76.4 WEST
* DEPTH 20 KM / 12 MILES
* LOCATION CUBA REGION

EVALUATION
---

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.2 OCCURRED IN THE CUBA REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  COLOMBIA... CUBA... HAITI... PANAMA... BAHAMAS... CAYMAN ISLANDS... AND JAMAICA.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

BELIZE... COSTA RICA... DOMINICAN REPUBLIC... GUATEMALA... HONDURAS... MEXICO... NICARAGUA... VENEZUELA... ARUBA... BONAIRE... CURACAO... DOMINICA... GRENADA... GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND VIRGIN ISLANDS... SAINT KITTS AND NEVIS... SAINT LUCIA... SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

ANGUILLA... ANTIGUA AND BARBUDA... BARBADOS... SABA AND SAINT EUSTATIUS... SAINT BARTHELEMY... SINT MAARTEN... SAINT MARTIN... AND TRINIDAD AND TOBAGO.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
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* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
PROGRESO	MEXICO	21.3N 89.7W	1928 03/21
PORLAMAR	VENEZUELA	10.9N 63.8W	2024 03/21
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	2036 03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO

THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
TELCHAC MX	21.3N	89.3W	1943	0.04M/ 0.1FT	28
DAUPHIN ISLAND AL	30.3N	88.1W	1858	0.06M/ 0.2FT	26
WRIGHT BEACH NC	34.2N	77.8W	1850	0.36M/ 1.2FT	28
GRAND ISLE LA	29.3N	90.0W	1832	0.11M/ 0.4FT	26
PORT OF SPAIN TT	10.6N	61.5W	1831	0.26M/ 0.9FT	22
TRIDENT PIER FL	28.4N	80.6W	1819	0.10M/ 0.3FT	28
CHARLOTTEVILLE TT	11.3N	60.5W	1800	0.38M/ 1.2FT	24
SCARBOROUGH TT	11.2N	60.7W	1750	0.24M/ 0.8FT	20
PILOTS STATION LA	28.9N	89.4W	1734	0.17M/ 0.6FT	26
VACA KEY FL	24.7N	81.1W	1728	0.21M/ 0.7FT	20
TORTOLA VI UK	18.4N	64.6W	1736	0.64M/ 2.1FT	16
KEY WEST FL	24.6N	81.8W	1729	0.21M/ 0.7FT	20
BRIDGEPORT BB	13.1N	59.6W	1717	0.47M/ 1.5FT	20
PRICKLEY BAY GD	12.0N	61.8W	1712	0.81M/ 2.7FT	18
PORT ST CHARLES BB	13.3N	59.6W	1712	0.45M/ 1.5FT	18
VIRGINIA KEY FL	25.7N	80.2W	1705	0.04M/ 0.1FT	24
CALLIAQUA VC	13.1N	61.2W	1701	1.36M/ 4.5FT	18
TELA HN	15.8N	87.5W	1704	1.03M/ 3.4FT	28
BOCAS DEL TORO PA	9.4N	82.3W	1659	1.89M/ 6.2FT	18
LE ROBERT MARTINIQU	14.7N	60.9W	1703	0.50M/ 1.6FT	20
FORT DE FRANCE MQ	14.6N	61.1W	1702	1.13M/ 3.7FT	22
BARBUDA AG	17.6N	61.8W	1658	0.20M/ 0.7FT	26
BERMUDA UK	32.4N	64.7W	1651	0.26M/ 0.8FT	22
LE PRECHEUR MARTINI	14.8N	61.2W	1646	0.91M/ 3.0FT	24
POINT A PITRE GP	16.2N	61.5W	1648	0.48M/ 1.6FT	28
ROSEAU DM	15.3N	61.4W	1653	0.96M/ 3.1FT	18
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1644	0.61M/ 2.0FT	14
DESHAIES GUADELOUPE	16.3N	61.8W	1640	0.82M/ 2.7FT	18
SAINT MARTIN FR	18.1N	63.1W	1639	0.67M/ 2.2FT	24
SAPZURRO CO	8.7N	77.4W	1641	2.45M/ 8.1FT	26
BASSETERRE KN	17.3N	62.7W	1638	0.50M/ 1.6FT	22
PARHAM AT	17.1N	61.8W	1634	0.27M/ 0.9FT	22
DESIRADE GUADELOUPE	16.3N	61.1W	1634	0.45M/ 1.5FT	26
COVENAS CO	9.4N	76.2W	1630	2.39M/ 7.9FT	16
EL PORVENIR PA	9.6N	78.9W	1623	2.36M/ 7.7FT	22
PUERTO MORELOS MX	21.4N	86.8W	1614	1.05M/ 3.5FT	26
ISLA MUJERES	21.2N	86.7W	1614	1.37M/ 4.5FT	22
SAN ANDRES CO	12.6N	81.7W	1610	1.84M/ 6.0FT	18

ESPERANZA VIEQUES P	18.1N	65.5W	1614	1.07M/ 3.5FT	28
LIMETREE VI	17.7N	64.8W	1613	1.16M/ 3.8FT	24
ST CROIX VI	17.7N	64.7W	1605	0.55M/ 1.8FT	14
CEIBA CABOTAGE HN	15.8N	86.8W	1611	1.04M/ 3.4FT	26
CAJA DE MUERTOS PR	17.9N	66.5W	1605	1.16M/ 3.8FT	28
PUERTO ESTRELLA CO	12.4N	71.3W	1602	2.93M/ 9.6FT	28
YABUCOA PR	18.1N	65.8W	1559	0.84M/ 2.8FT	22
BULLEN BAY CURACAO	12.2N	69.0W	1600	1.54M/ 5.1FT	16
MAGUEYES ISLAND PR	18.0N	67.0W	1600	1.21M/ 4.0FT	28
PORT SAN ANDRES DO	18.4N	69.6W	1606	1.86M/ 6.1FT	22
CARRIE BOW CAY BH	16.8N	88.1W	1601	1.16M/ 3.8FT	28
PUERTO CORTES HN	15.8N	88.0W	1555	1.56M/ 5.1FT	16
SANTA MARTA CO	11.2N	74.2W	1556	3.02M/ 9.9FT	18
PUERTO MORELOS MX	20.9N	86.9W	1546	1.74M/ 5.7FT	20
PUNTA CANA DO	18.5N	68.4W	1543	0.90M/ 3.0FT	24
SAN JUAN PR	18.5N	66.1W	1549	0.21M/ 0.7FT	26
AGUADILLA PR	18.5N	67.2W	1544	0.58M/ 1.9FT	18
UTILA ISLAND HN	16.1N	86.9W	1547	1.25M/ 4.1FT	26
MAYAGUEZ PR	18.2N	67.2W	1540	0.85M/ 2.8FT	26
ARECIBO PR	18.5N	66.7W	1549	0.33M/ 1.1FT	26
MONA ISLAND PR	18.1N	67.9W	1546	1.00M/ 3.3FT	20
DART 42407	15.3N	68.2W	1546	0.12M/ 0.4FT	22
PORT AU PRINCE HT	18.5N	72.4W	1539	5.37M/17.6FT	22
ROATAN ISLAND HN	16.3N	86.5W	1532	1.51M/ 5.0FT	16
BARAHONA DO	18.2N	71.1W	1530	1.51M/ 5.0FT	24
PORT ROYAL JM	17.9N	76.8W	1517	5.23M/17.2FT	14
PUERTO PLATA DO	19.8N	70.7W	1512	1.12M/ 3.7FT	20
JACMEL HT	18.2N	72.5W	1457	2.20M/ 7.2FT	24
CAP HAITIEN HT	19.8N	72.2W	1456	2.86M/ 9.4FT	22
GEORGE TOWN CY	19.3N	81.4W	1447	2.55M/ 8.4FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
---

* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

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PTWC Message #9

ZCZC
WECA41 PHEB 212125
TSUCAX

TSUNAMI MESSAGE NUMBER 9
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
2125 UTC TUE MAR 21 2017

...FINAL TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

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UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
---

* MAGNITUDE 8.2
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 19.6 NORTH 76.4 WEST
* DEPTH 20 KM / 12 MILES
* LOCATION CUBA REGION

EVALUATION
---

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.2 OCCURRED IN THE CUBA REGION AT 1400 UTC ON TUESDAY MARCH 21 2017.

* BASED ON ALL AVAILABLE DATA... THE TSUNAMI THREAT FROM THIS EARTHQUAKE HAS PASSED AND THERE IS NO FURTHER THREAT.

TSUNAMI THREAT FORECAST...UPDATED
---

* THE TSUNAMI THREAT HAS NOW LARGELY PASSED.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR ANY IMPACTED COASTAL AREAS SHOULD MONITOR CONDITIONS AT THE COAST TO DETERMINE IF AND WHEN IT IS SAFE TO RESUME NORMAL ACTIVITIES.

* PERSONS LOCATED NEAR IMPACTED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM LOCAL AUTHORITIES.

* REMAIN OBSERVANT AND EXERCISE NORMAL CAUTION NEAR THE SEA.

POTENTIAL IMPACTS
---

* MINOR SEA LEVEL FLUCTUATIONS OF UP TO 1 FOOT ABOVE AND BELOW THE NORMAL TIDE MAY CONTINUE OVER THE NEXT FEW HOURS.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

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PILOTS STATION LA	28.9N	89.4W	1734	0.17M/ 0.6FT	26
VACA KEY FL	24.7N	81.1W	1728	0.21M/ 0.7FT	20
TORTOLA VI UK	18.4N	64.6W	1736	0.64M/ 2.1FT	16
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DESIRADE GUADELOUPE	16.3N	61.1W	1634	0.45M/ 1.5FT	26
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MAGUEYES ISLAND PR	18.0N	67.0W	1600	1.21M/ 4.0FT	28
PORT SAN ANDRES DO	18.4N	69.6W	1606	1.86M/ 6.1FT	22
CARRIE BOW CAY BH	16.8N	88.1W	1601	1.16M/ 3.8FT	28
PUERTO CORTES HN	15.8N	88.0W	1555	1.56M/ 5.1FT	16
SANTA MARTA CO	11.2N	74.2W	1556	3.02M/ 9.9FT	18
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PUNTA CANA DO	18.5N	68.4W	1543	0.90M/ 3.0FT	24
SAN JUAN PR	18.5N	66.1W	1549	0.21M/ 0.7FT	26
AGUADILLA PR	18.5N	67.2W	1544	0.58M/ 1.9FT	18
UTILA ISLAND HN	16.1N	86.9W	1547	1.25M/ 4.1FT	26
MAYAGUEZ PR	18.2N	67.2W	1540	0.85M/ 2.8FT	26
ARECIBO PR	18.5N	66.7W	1549	0.33M/ 1.1FT	26
MONA ISLAND PR	18.1N	67.9W	1546	1.00M/ 3.3FT	20
DART 42407	15.3N	68.2W	1546	0.12M/ 0.4FT	22
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BARAHONA DO	18.2N	71.1W	1530	1.51M/ 5.0FT	24
PORT ROYAL JM	17.9N	76.8W	1517	5.23M/17.2FT	14
PUERTO PLATA DO	19.8N	70.7W	1512	1.12M/ 3.7FT	20
JACMEL HT	18.2N	72.5W	1457	2.20M/ 7.2FT	24
CAP HAITIEN HT	19.8N	72.2W	1456	2.86M/ 9.4FT	22
GEORGE TOWN CY	19.3N	81.4W	1447	2.55M/ 8.4FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
---

* THIS WILL BE THE FINAL STATEMENT ISSUED FOR THIS EVENT UNLESS NEW INFORMATION IS RECEIVED OR THE SITUATION CHANGES.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

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Northeastern Antilles Earthquake Scenario

The following messages created for the CARIBE WAVE 17 tsunami exercise are representative of the official standard products issued by the PTWC during a large magnitude 8.7 earthquake and tsunami originating in the Northeastern Antilles. During a real event, the TWCs would also issue graphical and html-based products to their web sites and via RSS. The alerts would persist longer during a real event than is depicted in this exercise.

PTWC Message #1

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ZCZC
WECA41 PHEB 211405
TSUCAX

TSUNAMI MESSAGE NUMBER 1
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1405 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****


PRELIMINARY EARTHQUAKE PARAMETERS
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  * MAGNITUDE      8.3
  * ORIGIN TIME    1400 UTC MAR 21 2017
  * COORDINATES    17.0 NORTH  60.7 WEST
  * DEPTH          40 KM / 25 MILES
  * LOCATION       LEEWARD ISLANDS

EVALUATION
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  * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN
    THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.

  * BASED ON THE PRELIMINARY EARTHQUAKE PARAMETERS... WIDESPREAD
    HAZARDOUS TSUNAMI WAVES ARE POSSIBLE.

TSUNAMI THREAT FORECAST
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  * HAZARDOUS TSUNAMI WAVES FROM THIS EARTHQUAKE ARE POSSIBLE
    WITHIN THE NEXT THREE HOURS ALONG SOME COASTS OF

      MONTSERRAT... GUADELOUPE... DOMINICA... SAINT LUCIA...
      MARTINIQUE... ANTIGUA... BARBUDA... SINT EUSTATIUS...
      SAINT KITTS... SABA... BARBADOS... ANGUILLA... US VIRGIN
      IS... SAINT VINCENT... BR VIRGIN IS... SINT MAARTEN...
      PUERTO RICO... SAINT BARTHELEMY... SAINT MARTIN...
      GRENADA... DOMINICAN REP... TURKS N CAICOS... TRINIDAD
      TOBAGO... HAITI... BONAIRE... BAHAMAS... CUBA... ARUBA...
      VENEZUELA... BERMUDA... CURACAO... CAYMAN ISLANDS...
      COLOMBIA AND JAMAICA
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RECOMMENDED ACTIONS
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* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
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* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THE REGION IDENTIFIED WITH A POTENTIAL TSUNAMI THREAT. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1426 03/21
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1430 03/21
ROSEAU	DOMINICA	15.3N	61.4W	1432 03/21
CASTRIES	SAINT LUCIA	14.0N	61.0W	1439 03/21
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1439 03/21
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1439 03/21
PALMETTO POINT	BARBUDA	17.6N	61.9W	1441 03/21
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1443 03/21
BASSETERRE	SAINT KITTS	17.3N	62.7W	1443 03/21
SABA	SABA	17.6N	63.2W	1444 03/21
BRIDGETOWN	BARBADOS	13.1N	59.6W	1447 03/21
THE VALLEY	ANGUILLA	18.3N	63.1W	1449 03/21
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1451 03/21
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1453 03/21
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1453 03/21
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1455 03/21
SAN JUAN	PUERTO RICO	18.5N	66.1W	1455 03/21
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1507 03/21
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1508 03/21
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1513 03/21
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1513 03/21
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1515 03/21
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1518 03/21
SAINT GEORGES	GRENADA	12.0N	61.8W	1520 03/21
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1521 03/21
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1523 03/21
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1529 03/21
GRAND TURK	TURKS N CAICOS	21.5N	71.1W	1531 03/21
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1532 03/21
CAP HAITEN	HAITI	19.8N	72.2W	1540 03/21
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1542 03/21
ONIMA	BONAIRE	12.3N	68.3W	1544 03/21
MAYAGUANA	BAHAMAS	22.3N	73.0W	1547 03/21
WEST CAICOS	TURKS N CAICOS	21.7N	72.5W	1548 03/21

BARACOA	CUBA	20.4N	74.5W	1559 03/21
JACAMEL	HAITI	18.1N	72.5W	1600 03/21
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1601 03/21
ORANJESTAD	ARUBA	12.5N	70.0W	1601 03/21
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1602 03/21
MAIQUETIA	VENEZUELA	10.6N	67.0W	1607 03/21
LONG ISLAND	BAHAMAS	23.3N	75.1W	1611 03/21
JEREMIE	HAITI	18.6N	74.1W	1611 03/21
RUTHS BAY	BERMUDA	32.4N	64.6W	1612 03/21
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1614 03/21
GIBARA	CUBA	21.1N	76.1W	1617 03/21
CUMANA	VENEZUELA	10.5N	64.2W	1617 03/21
WILLEMSTAD	CURACAO	12.1N	68.9W	1618 03/21
EXUMA	BAHAMAS	23.6N	75.9W	1619 03/21
CAT ISLAND	BAHAMAS	24.4N	75.5W	1619 03/21
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1621 03/21
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1625 03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1633 03/21
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1633 03/21
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1645 03/21
NASSAU	BAHAMAS	25.1N	77.4W	1646 03/21
SANTA MARTA	COLOMBIA	11.2N	74.2W	1648 03/21
MONTEGO BAY	JAMAICA	18.5N	77.9W	1657 03/21
FREEPORT	BAHAMAS	26.5N	78.8W	1658 03/21
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1701 03/21
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1701 03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1703 03/21
PORT AU PRINCE	HAITI	18.5N	72.4W	1704 03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

NEXT UPDATE AND ADDITIONAL INFORMATION
---

* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

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  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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NNNN
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PTWC Message #2

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ZCZC
WECA41 PHEB 211425
TSUCAX

TSUNAMI MESSAGE NUMBER 2
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1425 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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  * MAGNITUDE      8.5
  * ORIGIN TIME    1400 UTC MAR 21 2017
  * COORDINATES    17.0 NORTH  60.7 WEST
  * DEPTH          40 KM / 25 MILES
  * LOCATION       LEEWARD ISLANDS

EVALUATION
----------

  * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.5 OCCURRED IN
    THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.

  * TSUNAMI WAVES HAVE BEEN OBSERVED.

  * BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE
    FORECAST FOR SOME COASTS.
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TSUNAMI THREAT FORECAST...UPDATED
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GUADELOUPE... MARTINIQUE... MONTSERRAT... SABA AND SAINT EUSTATIUS... AND SAINT KITTS AND NEVIS.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  DOMINICAN REPUBLIC... FRENCH GUYANE... GUYANA... SURINAME... VENEZUELA... ANGUILLA... ARUBA... BERMUDA... BONAIRE... CURACAO... GRENADA... PUERTO RICO AND VIRGIN ISLANDS... SAINT BARTHELEMY... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN... SAINT VINCENT AND THE GRENADINES... AND TRINIDAD AND TOBAGO.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  BRAZIL... COLOMBIA... COSTA RICA... CUBA... HAITI... NICARAGUA... PANAMA... BAHAMAS... JAMAICA... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
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* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1426 03/21
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SAINT JOHNS	ANTIGUA	17.1N	61.9W	1439 03/21
PALMETTO POINT	BARBUDA	17.6N	61.9W	1441 03/21
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1443 03/21
BASSETERRE	SAINT KITTS	17.3N	62.7W	1443 03/21
SABA	SABA	17.6N	63.2W	1444 03/21
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THE VALLEY	ANGUILLA	18.3N	63.1W	1449 03/21
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1451 03/21
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1453 03/21
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1453 03/21
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1455 03/21
SAN JUAN	PUERTO RICO	18.5N	66.1W	1455 03/21
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1507 03/21
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1508 03/21
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1513 03/21
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1513 03/21
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1515 03/21
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1518 03/21
SAINT GEORGES	GRENADA	12.0N	61.8W	1520 03/21
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1521 03/21
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1523 03/21
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1529 03/21
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PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1532 03/21
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SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1542 03/21
ONIMA	BONAIRE	12.3N	68.3W	1544 03/21
MAYAGUANA	BAHAMAS	22.3N	73.0W	1547 03/21
WEST CAICOS	TURKS N CAICOS	21.7N	72.5W	1548 03/21
BARACOA	CUBA	20.4N	74.5W	1559 03/21
JACAMEL	HAITI	18.1N	72.5W	1600 03/21
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1601 03/21
ORANJESTAD	ARUBA	12.5N	70.0W	1601 03/21
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1602 03/21
MAIQUETIA	VENEZUELA	10.6N	67.0W	1607 03/21
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GIBARA	CUBA	21.1N	76.1W	1617 03/21
CUMANA	VENEZUELA	10.5N	64.2W	1617 03/21
WILLEMSTAD	CURACAO	12.1N	68.9W	1618 03/21
EXUMA	BAHAMAS	23.6N	75.9W	1619 03/21
CAT ISLAND	BAHAMAS	24.4N	75.5W	1619 03/21
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1621 03/21
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1625 03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1633 03/21
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1633 03/21
NASSAU	BAHAMAS	25.1N	77.4W	1646 03/21
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FREEPORT	BAHAMAS	26.5N	78.8W	1658 03/21
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1701 03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1703 03/21

PORT AU PRINCE	HAITI	18.5N	72.4W	1704 03/21
BIMINI	BAHAMAS	25.8N	79.3W	1711 03/21
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1712 03/21
KINGSTON	JAMAICA	17.9N	76.9W	1713 03/21
RIOHACHA	COLOMBIA	11.6N	72.9W	1716 03/21
ALIGANDI	PANAMA	9.2N	78.0W	1725 03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1731 03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1732 03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1735 03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1743 03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1747 03/21
CAYENNE	FRENCH GUYANE	4.9N	52.3W	1801 03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1803 03/21
COLON	PANAMA	9.4N	79.9W	1805 03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1817 03/21
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1828 03/21
GEORGETOWN	GUYANA	6.8N	58.2W	1847 03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1855 03/21
PARAMARIBO	SURINAME	5.9N	55.2W	1904 03/21
PORLAMAR	VENEZUELA	10.9N	63.8W	1912 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1928 03/21
ILHA DE MARACA	BRAZIL	2.2N	50.5W	2147 03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2222 03/21

POTENTIAL IMPACTS

* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
DESIRADE GUADELOUPE	16.3N	61.1W	1414	14.72M/48.3FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION

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  * THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF
    THE SITUATION WARRANTS.

  * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.
    GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT
    EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

  * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT
    PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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NNNN
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PTWC Message #3

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ZCZC
WECA41 PHEB 211525
TSUCAX

TSUNAMI MESSAGE NUMBER 3
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1525 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

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 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
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 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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  * MAGNITUDE      8.5
  * ORIGIN TIME    1400 UTC MAR 21 2017
  * COORDINATES    17.0 NORTH  60.7 WEST
  * DEPTH          40 KM / 25 MILES
  * LOCATION       LEEWARD ISLANDS
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EVALUATION
----

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.5 OCCURRED IN THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
----

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GUADELOUPE... MARTINIQUE... MONTSERRAT... SABA AND SAINT EUSTATIUS... AND SAINT KITTS AND NEVIS.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  DOMINICAN REPUBLIC... FRENCH GUYANE... GUYANA... SURINAME... VENEZUELA... ANGUILLA... ARUBA... BERMUDA... BONAIRE... CURACAO... GRENADA... PUERTO RICO AND VIRGIN ISLANDS... SAINT BARTHELEMY... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN... SAINT VINCENT AND THE GRENADINES... AND TRINIDAD AND TOBAGO.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  BRAZIL... COLOMBIA... COSTA RICA... CUBA... HAITI... NICARAGUA... PANAMA... BAHAMAS... JAMAICA... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
----

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1426 03/21
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1430 03/21
ROSEAU	DOMINICA	15.3N	61.4W	1432 03/21
CASTRIES	SAINT LUCIA	14.0N	61.0W	1439 03/21
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1439 03/21
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1439 03/21
PALMETTO POINT	BARBUDA	17.6N	61.9W	1441 03/21
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1443 03/21
BASSETERRE	SAINT KITTS	17.3N	62.7W	1443 03/21
SABA	SABA	17.6N	63.2W	1444 03/21
BRIDGETOWN	BARBADOS	13.1N	59.6W	1447 03/21
THE VALLEY	ANGUILLA	18.3N	63.1W	1449 03/21
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1451 03/21
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1453 03/21
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1453 03/21
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1455 03/21
SAN JUAN	PUERTO RICO	18.5N	66.1W	1455 03/21
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1507 03/21
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1508 03/21
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1513 03/21
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1513 03/21
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1515 03/21
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1518 03/21
SAINT GEORGES	GRENADA	12.0N	61.8W	1520 03/21
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1521 03/21
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1523 03/21
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1529 03/21
GRAND TURK	TURKS N CAICOS	21.5N	71.1W	1531 03/21
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1532 03/21
CAP HAITEN	HAITI	19.8N	72.2W	1540 03/21
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1542 03/21
ONIMA	BONAIRE	12.3N	68.3W	1544 03/21
MAYAGUANA	BAHAMAS	22.3N	73.0W	1547 03/21
WEST CAICOS	TURKS N CAICOS	21.7N	72.5W	1548 03/21
BARACOA	CUBA	20.4N	74.5W	1559 03/21
JACAMEL	HAITI	18.1N	72.5W	1600 03/21
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1601 03/21
ORANJESTAD	ARUBA	12.5N	70.0W	1601 03/21
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1602 03/21
MAIQUETIA	VENEZUELA	10.6N	67.0W	1607 03/21
LONG ISLAND	BAHAMAS	23.3N	75.1W	1611 03/21
JEREMIE	HAITI	18.6N	74.1W	1611 03/21
RUTHS BAY	BERMUDA	32.4N	64.6W	1612 03/21
GIBARA	CUBA	21.1N	76.1W	1617 03/21
CUMANA	VENEZUELA	10.5N	64.2W	1617 03/21
WILLEMSTAD	CURACAO	12.1N	68.9W	1618 03/21
EXUMA	BAHAMAS	23.6N	75.9W	1619 03/21

CAT ISLAND	BAHAMAS	24.4N	75.5W	1619 03/21
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1621 03/21
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1625 03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1633 03/21
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1633 03/21
NASSAU	BAHAMAS	25.1N	77.4W	1646 03/21
SANTA MARTA	COLOMBIA	11.2N	74.2W	1648 03/21
MONTEGO BAY	JAMAICA	18.5N	77.9W	1657 03/21
FREEPORT	BAHAMAS	26.5N	78.8W	1658 03/21
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1701 03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1703 03/21
PORT AU PRINCE	HAITI	18.5N	72.4W	1704 03/21
BIMINI	BAHAMAS	25.8N	79.3W	1711 03/21
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1712 03/21
KINGSTON	JAMAICA	17.9N	76.9W	1713 03/21
RIOHACHA	COLOMBIA	11.6N	72.9W	1716 03/21
ALIGANDI	PANAMA	9.2N	78.0W	1725 03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1731 03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1732 03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1735 03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1743 03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1747 03/21
CAYENNE	FRENCH GUYANE	4.9N	52.3W	1801 03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1803 03/21
COLON	PANAMA	9.4N	79.9W	1805 03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1817 03/21
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1828 03/21
GEORGETOWN	GUYANA	6.8N	58.2W	1847 03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1855 03/21
PARAMARIBO	SURINAME	5.9N	55.2W	1904 03/21
PORLAMAR	VENEZUELA	10.9N	63.8W	1912 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1928 03/21
ILHA DE MARACA	BRAZIL	2.2N	50.5W	2147 03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2222 03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

GAUGE LOCATION	GAUGE COORDINATES LAT	LON	TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
MONA ISLAND PR	18.1N	67.9W	1525	1.01M/ 3.3FT	28
SAINT MARTIN FR	18.1N	63.1W	1517	2.10M/ 6.9FT	22
DART 41420	23.5N	67.3W	1518	0.08M/ 0.3FT	16
AGUADILLA PR	18.5N	67.2W	1517	0.86M/ 2.8FT	28
MAYAGUEZ PR	18.2N	67.2W	1522	0.86M/ 2.8FT	22
ESPERANZA VIEQUES P	18.1N	65.5W	1513	1.47M/ 4.8FT	28
ARECIBO PR	18.5N	66.7W	1507	0.77M/ 2.5FT	16
YABUCOA PR	18.1N	65.8W	1507	1.90M/ 6.2FT	18
DART 41421	23.4N	63.9W	1503	0.16M/ 0.5FT	20
SAN JUAN PR	18.5N	66.1W	1500	0.89M/ 2.9FT	24
LIMETREE VI	17.7N	64.8W	1506	1.19M/ 3.9FT	26
CALLIAQUA VC	13.1N	61.2W	1502	1.56M/ 5.1FT	18
ST CROIX VI	17.7N	64.7W	1502	1.19M/ 3.9FT	26
BARBUDA AG	17.6N	61.8W	1455	4.26M/14.0FT	26
BRIDGEPORT BB	13.1N	59.6W	1501	2.08M/ 6.8FT	26
PORT ST CHARLES BB	13.3N	59.6W	1455	2.23M/ 7.3FT	20
BASSETERRE KN	17.3N	62.7W	1457	2.76M/ 9.1FT	22
FORT DE FRANCE MQ	14.6N	61.1W	1451	2.84M/ 9.3FT	22
LE ROBERT MARTINIQU	14.7N	60.9W	1441	2.84M/ 9.3FT	16
ROSEAU DM	15.3N	61.4W	1442	3.23M/10.6FT	24
LE PRECHEUR MARTINI	14.8N	61.2W	1442	2.62M/ 8.6FT	14
POINT A PITRE GP	16.2N	61.5W	1439	20.10M/65.9FT	20
DESHAIES GUADELOUPE	16.3N	61.8W	1427	6.35M/20.8FT	24
PARHAM AT	17.1N	61.8W	1430	12.98M/42.6FT	22
DESIRADE GUADELOUPE	16.3N	61.1W	1414	14.72M/48.3FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
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* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

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NNNN

PTWC Message #4

ZCZC
WECA41 PHEB 211625
TSUCAX

TSUNAMI MESSAGE NUMBER 4
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1625 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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* MAGNITUDE 8.5
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 17.0 NORTH 60.7 WEST
* DEPTH 40 KM / 25 MILES
* LOCATION LEEWARD ISLANDS

EVALUATION
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* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.5 OCCURRED IN THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
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* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GUADELOUPE... MARTINIQUE... MONTSERRAT... SABA AND SAINT EUSTATIUS... AND SAINT KITTS AND NEVIS.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

DOMINICAN REPUBLIC... FRENCH GUYANE... GUYANA... SURINAME... VENEZUELA... ANGUILLA... ARUBA... BERMUDA... BONAIRE... CURACAO... GRENADA... PUERTO RICO AND VIRGIN ISLANDS... SAINT BARTHELEMY... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN... SAINT VINCENT AND THE GRENADINES... AND TRINIDAD AND TOBAGO.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

BRAZIL... COLOMBIA... COSTA RICA... CUBA... HAITI... NICARAGUA... PANAMA... BAHAMAS... JAMAICA... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
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ESTIMATED TIMES OF ARRIVAL
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* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1529 03/21
GRAND TURK	TURKS N CAICOS	21.5N	71.1W	1531 03/21
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1532 03/21
CAP HAITEN	HAITI	19.8N	72.2W	1540 03/21
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1542 03/21
ONIMA	BONAIRE	12.3N	68.3W	1544 03/21
MAYAGUANA	BAHAMAS	22.3N	73.0W	1547 03/21
WEST CAICOS	TURKS N CAICOS	21.7N	72.5W	1548 03/21
BARACOA	CUBA	20.4N	74.5W	1559 03/21
JACAMEL	HAITI	18.1N	72.5W	1600 03/21
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1601 03/21
ORANJESTAD	ARUBA	12.5N	70.0W	1601 03/21
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1602 03/21

MAIQUETIA	VENEZUELA	10.6N	67.0W	1607 03/21
LONG ISLAND	BAHAMAS	23.3N	75.1W	1611 03/21
JEREMIE	HAITI	18.6N	74.1W	1611 03/21
RUTHS BAY	BERMUDA	32.4N	64.6W	1612 03/21
GIBARA	CUBA	21.1N	76.1W	1617 03/21
CUMANA	VENEZUELA	10.5N	64.2W	1617 03/21
WILLEMSTAD	CURACAO	12.1N	68.9W	1618 03/21
EXUMA	BAHAMAS	23.6N	75.9W	1619 03/21
CAT ISLAND	BAHAMAS	24.4N	75.5W	1619 03/21
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1621 03/21
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1625 03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1633 03/21
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1633 03/21
NASSAU	BAHAMAS	25.1N	77.4W	1646 03/21
SANTA MARTA	COLOMBIA	11.2N	74.2W	1648 03/21
MONTEGO BAY	JAMAICA	18.5N	77.9W	1657 03/21
FREEPORT	BAHAMAS	26.5N	78.8W	1658 03/21
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1701 03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1703 03/21
PORT AU PRINCE	HAITI	18.5N	72.4W	1704 03/21
BIMINI	BAHAMAS	25.8N	79.3W	1711 03/21
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1712 03/21
KINGSTON	JAMAICA	17.9N	76.9W	1713 03/21
RIOHACHA	COLOMBIA	11.6N	72.9W	1716 03/21
ALIGANDI	PANAMA	9.2N	78.0W	1725 03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1731 03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1732 03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1735 03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1743 03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1747 03/21
CAYENNE	FRENCH GUYANE	4.9N	52.3W	1801 03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1803 03/21
COLON	PANAMA	9.4N	79.9W	1805 03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1817 03/21
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1828 03/21
GEORGETOWN	GUYANA	6.8N	58.2W	1847 03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1855 03/21
PARAMARIBO	SURINAME	5.9N	55.2W	1904 03/21
PORLAMAR	VENEZUELA	10.9N	63.8W	1912 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1928 03/21
ILHA DE MARACA	BRAZIL	2.2N	50.5W	2147 03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2222 03/21

POTENTIAL IMPACTS
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* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

GAUGE LOCATION	GAUGE COORDINATES LAT	LON	TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
BERMUDA UK	32.4N	64.7W	1622	0.75M/ 2.4FT	18
TORTOLA VI UK	18.4N	64.6W	1612	1.68M/ 5.5FT	24
PORT SAN ANDRES DO	18.4N	69.6W	1614	1.29M/ 4.2FT	26
JACMEL HT	18.2N	72.5W	1614	0.83M/ 2.7FT	22
BULLEN BAY CURACAO	12.2N	69.0W	1607	1.55M/ 5.1FT	22
BARAHONA DO	18.2N	71.1W	1600	0.90M/ 3.0FT	26
CAP HAITIEN HT	19.8N	72.2W	1548	0.41M/ 1.3FT	16
CHARLOTTEVILLE TT	11.3N	60.5W	1541	1.29M/ 4.2FT	22
SCARBOROUGH TT	11.2N	60.7W	1534	1.29M/ 4.2FT	26
DART 42407	15.3N	68.2W	1535	0.13M/ 0.4FT	22
MAGUEYES ISLAND PR	18.0N	67.0W	1531	1.25M/ 4.1FT	18
PUERTO PLATA DO	19.8N	70.7W	1535	0.57M/ 1.9FT	28
PUNTA CANA DO	18.5N	68.4W	1534	1.11M/ 3.6FT	24
PRICKLEY BAY GD	12.0N	61.8W	1527	1.82M/ 6.0FT	14
CAJA DE MUERTOS PR	17.9N	66.5W	1531	1.50M/ 4.9FT	26
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1527	1.68M/ 5.5FT	28
MONA ISLAND PR	18.1N	67.9W	1525	1.01M/ 3.3FT	28
SAINT MARTIN FR	18.1N	63.1W	1517	2.10M/ 6.9FT	22
DART 41420	23.5N	67.3W	1518	0.08M/ 0.3FT	16
AGUADILLA PR	18.5N	67.2W	1517	0.86M/ 2.8FT	28
MAYAGUEZ PR	18.2N	67.2W	1522	0.86M/ 2.8FT	22
ESPERANZA VIEQUES P	18.1N	65.5W	1513	1.47M/ 4.8FT	28
ARECIBO PR	18.5N	66.7W	1507	0.77M/ 2.5FT	16
YABUCOA PR	18.1N	65.8W	1507	1.90M/ 6.2FT	18
DART 41421	23.4N	63.9W	1503	0.16M/ 0.5FT	20
SAN JUAN PR	18.5N	66.1W	1500	0.89M/ 2.9FT	24
LIMETREE VI	17.7N	64.8W	1506	1.19M/ 3.9FT	26
CALLIAQUA VC	13.1N	61.2W	1502	1.56M/ 5.1FT	18
ST CROIX VI	17.7N	64.7W	1502	1.19M/ 3.9FT	26
BARBUDA AG	17.6N	61.8W	1455	4.26M/14.0FT	26
BRIDGEPORT BB	13.1N	59.6W	1501	2.08M/ 6.8FT	26
PORT ST CHARLES BB	13.3N	59.6W	1455	2.23M/ 7.3FT	20
BASSETERRE KN	17.3N	62.7W	1457	2.76M/ 9.1FT	22
FORT DE FRANCE MQ	14.6N	61.1W	1451	2.84M/ 9.3FT	22
LE ROBERT MARTINIQU	14.7N	60.9W	1441	2.84M/ 9.3FT	16
ROSEAU DM	15.3N	61.4W	1442	3.23M/10.6FT	24
LE PRECHEUR MARTINI	14.8N	61.2W	1442	2.62M/ 8.6FT	14
POINT A PITRE GP	16.2N	61.5W	1439	20.10M/65.9FT	20
DESHAIES GUADELOUPE	16.3N	61.8W	1427	6.35M/20.8FT	24
PARHAM AT	17.1N	61.8W	1430	12.98M/42.6FT	22
DESIRADE GUADELOUPE	16.3N	61.1W	1414	14.72M/48.3FT	16

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NEXT UPDATE AND ADDITIONAL INFORMATION
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  * THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF
    THE SITUATION WARRANTS.

  * AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S.
    GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT
    EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

  * FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT
    PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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NNNN
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PTWC Message #5

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ZCZC
WECA41 PHEB 211725
TSUCAX

TSUNAMI MESSAGE NUMBER 5
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1725 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...


**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

 NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF
 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****


PRELIMINARY EARTHQUAKE PARAMETERS
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  * MAGNITUDE      8.5
  * ORIGIN TIME    1400 UTC MAR 21 2017
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* COORDINATES 17.0 NORTH 60.7 WEST
* DEPTH 40 KM / 25 MILES
* LOCATION LEEWARD ISLANDS

EVALUATION
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* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.5 OCCURRED IN THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GUADELOUPE... MARTINIQUE... MONTSERRAT... SABA AND SAINT EUSTATIUS... AND SAINT KITTS AND NEVIS.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  DOMINICAN REPUBLIC... FRENCH GUYANE... GUYANA... SURINAME... VENEZUELA... ANGUILLA... ARUBA... BERMUDA... BONAIRE... CURACAO... GRENADA... PUERTO RICO AND VIRGIN ISLANDS... SAINT BARTHELEMY... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN... SAINT VINCENT AND THE GRENADINES... AND TRINIDAD AND TOBAGO.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  BRAZIL... COLOMBIA... COSTA RICA... CUBA... HAITI... NICARAGUA... PANAMA... BAHAMAS... JAMAICA... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1625 03/21
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1633 03/21
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1633 03/21
NASSAU	BAHAMAS	25.1N	77.4W	1646 03/21
SANTA MARTA	COLOMBIA	11.2N	74.2W	1648 03/21
MONTEGO BAY	JAMAICA	18.5N	77.9W	1657 03/21
FREEPORT	BAHAMAS	26.5N	78.8W	1658 03/21
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1701 03/21
CARTAGENA	COLOMBIA	10.4N	75.6W	1703 03/21
PORT AU PRINCE	HAITI	18.5N	72.4W	1704 03/21
BIMINI	BAHAMAS	25.8N	79.3W	1711 03/21
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1712 03/21
KINGSTON	JAMAICA	17.9N	76.9W	1713 03/21
RIOHACHA	COLOMBIA	11.6N	72.9W	1716 03/21
ALIGANDI	PANAMA	9.2N	78.0W	1725 03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1731 03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1732 03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1735 03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1743 03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1747 03/21
CAYENNE	FRENCH GUYANE	4.9N	52.3W	1801 03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1803 03/21
COLON	PANAMA	9.4N	79.9W	1805 03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1817 03/21
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1828 03/21
GEORGETOWN	GUYANA	6.8N	58.2W	1847 03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1855 03/21
PARAMARIBO	SURINAME	5.9N	55.2W	1904 03/21
PORLAMAR	VENEZUELA	10.9N	63.8W	1912 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1928 03/21
ILHA DE MARACA	BRAZIL	2.2N	50.5W	2147 03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2222 03/21

POTENTIAL IMPACTS
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* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
PORT AU PRINCE HT	18.5N	72.4W	1718	0.72M/ 2.3FT	22
DART 44401	37.5N	50.0W	1710	0.15M/ 0.5FT	26
GEORGE TOWN CY	19.3N	81.4W	1707	0.13M/ 0.4FT	22
SANTA MARTA CO	11.2N	74.2W	1654	0.59M/ 1.9FT	24
PORT OF SPAIN TT	10.6N	61.5W	1641	1.16M/ 3.8FT	28
DART 41424	32.9N	72.5W	1647	0.07M/ 0.2FT	18
PUERTO ESTRELLA CO	12.4N	71.3W	1635	0.85M/ 2.8FT	14
BERMUDA UK	32.4N	64.7W	1622	0.75M/ 2.4FT	18
TORTOLA VI UK	18.4N	64.6W	1612	1.68M/ 5.5FT	24
PORT SAN ANDRES DO	18.4N	69.6W	1614	1.29M/ 4.2FT	26
JACMEL HT	18.2N	72.5W	1614	0.83M/ 2.7FT	22
BULLEN BAY CURACAO	12.2N	69.0W	1607	1.55M/ 5.1FT	22
BARAHONA DO	18.2N	71.1W	1600	0.90M/ 3.0FT	26
CAP HAITIEN HT	19.8N	72.2W	1548	0.41M/ 1.3FT	16
CHARLOTTEVILLE TT	11.3N	60.5W	1541	1.29M/ 4.2FT	22
SCARBOROUGH TT	11.2N	60.7W	1534	1.29M/ 4.2FT	26
DART 42407	15.3N	68.2W	1535	0.13M/ 0.4FT	22
MAGUEYES ISLAND PR	18.0N	67.0W	1531	1.25M/ 4.1FT	18
PUERTO PLATA DO	19.8N	70.7W	1535	0.57M/ 1.9FT	28
PUNTA CANA DO	18.5N	68.4W	1534	1.11M/ 3.6FT	24
PRICKLEY BAY GD	12.0N	61.8W	1527	1.82M/ 6.0FT	14
CAJA DE MUERTOS PR	17.9N	66.5W	1531	1.50M/ 4.9FT	26
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1527	1.68M/ 5.5FT	28
MONA ISLAND PR	18.1N	67.9W	1525	1.01M/ 3.3FT	28
SAINT MARTIN FR	18.1N	63.1W	1517	2.10M/ 6.9FT	22
DART 41420	23.5N	67.3W	1518	0.08M/ 0.3FT	16
AGUADILLA PR	18.5N	67.2W	1517	0.86M/ 2.8FT	28
MAYAGUEZ PR	18.2N	67.2W	1522	0.86M/ 2.8FT	22
ESPERANZA VIEQUES P	18.1N	65.5W	1513	1.47M/ 4.8FT	28
ARECIBO PR	18.5N	66.7W	1507	0.77M/ 2.5FT	16
YABUCOA PR	18.1N	65.8W	1507	1.90M/ 6.2FT	18

DART 41421	23.4N	63.9W	1503	0.16M/ 0.5FT 20
SAN JUAN PR	18.5N	66.1W	1500	0.89M/ 2.9FT 24
LIMETREE VI	17.7N	64.8W	1506	1.19M/ 3.9FT 26
CALLIAQUA VC	13.1N	61.2W	1502	1.56M/ 5.1FT 18
ST CROIX VI	17.7N	64.7W	1502	1.19M/ 3.9FT 26
BARBUDA AG	17.6N	61.8W	1455	4.26M/14.0FT 26
BRIDGEPORT BB	13.1N	59.6W	1501	2.08M/ 6.8FT 26
PORT ST CHARLES BB	13.3N	59.6W	1455	2.23M/ 7.3FT 20
BASSETERRE KN	17.3N	62.7W	1457	2.76M/ 9.1FT 22
FORT DE FRANCE MQ	14.6N	61.1W	1451	2.84M/ 9.3FT 22
LE ROBERT MARTINIQU	14.7N	60.9W	1441	2.84M/ 9.3FT 16
ROSEAU DM	15.3N	61.4W	1442	3.23M/10.6FT 24
LE PRECHEUR MARTINI	14.8N	61.2W	1442	2.62M/ 8.6FT 14
POINT A PITRE GP	16.2N	61.5W	1439	20.10M/65.9FT 20
DESHAIES GUADELOUPE	16.3N	61.8W	1427	6.35M/20.8FT 24
PARHAM AT	17.1N	61.8W	1430	12.98M/42.6FT 22
DESIRADE GUADELOUPE	16.3N	61.1W	1414	14.72M/48.3FT 16

NEXT UPDATE AND ADDITIONAL INFORMATION
---

* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

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NNNN

PTWC Message #6

ZCZC
WECA41 PHEB 211825
TSUCAX

TSUNAMI MESSAGE NUMBER 6
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1825 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

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**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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* MAGNITUDE 8.5
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 17.0 NORTH 60.7 WEST
* DEPTH 40 KM / 25 MILES
* LOCATION LEEWARD ISLANDS

EVALUATION
---

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.5 OCCURRED IN THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST...UPDATED
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GUADELOUPE... MARTINIQUE... MONTSERRAT... SABA AND SAINT EUSTATIUS... AND SAINT KITTS AND NEVIS.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  DOMINICAN REPUBLIC... FRENCH GUYANE... GUYANA... SURINAME... VENEZUELA... ANGUILLA... ARUBA... BERMUDA... BONAIRE... CURACAO... GRENADA... PUERTO RICO AND VIRGIN ISLANDS... SAINT BARTHELEMY... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN... SAINT VINCENT AND THE GRENADINES... AND TRINIDAD AND TOBAGO.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  BRAZIL... COLOMBIA... COSTA RICA... CUBA... HAITI... NICARAGUA... PANAMA... BAHAMAS... JAMAICA... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES		ETA(UTC)
ALIGANDI	PANAMA	9.2N	78.0W	1725 03/21
PUERTO CARRETO	PANAMA	8.8N	77.6W	1731 03/21
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1732 03/21
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1735 03/21
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1743 03/21
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1747 03/21
CAYENNE	FRENCH GUYANE	4.9N	52.3W	1801 03/21
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1803 03/21
COLON	PANAMA	9.4N	79.9W	1805 03/21
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1817 03/21
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1828 03/21
GEORGETOWN	GUYANA	6.8N	58.2W	1847 03/21
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1855 03/21
PARAMARIBO	SURINAME	5.9N	55.2W	1904 03/21
PORLAMAR	VENEZUELA	10.9N	63.8W	1912 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1928 03/21
ILHA DE MARACA	BRAZIL	2.2N	50.5W	2147 03/21
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2222 03/21

POTENTIAL IMPACTS
---

* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
LIMON CR	10.0N	83.2W	1825	0.35M/ 1.1FT	28
CARRIE BOW CAY BH	16.8N	88.1W	1817	0.09M/ 0.3FT	24
PUERTO CORTES HN	15.8N	88.0W	1811	0.09M/ 0.3FT	20
PUERTO MORELOS MX	20.9N	86.9W	1800	0.10M/ 0.3FT	26
UTILA ISLAND HN	16.1N	86.9W	1757	0.09M/ 0.3FT	20
HATTERAS NC	35.2N	75.7W	1803	0.66M/ 2.2FT	16
SAPZURRO CO	8.7N	77.4W	1758	0.40M/ 1.3FT	20
VIRGINIA KEY FL	25.7N	80.2W	1756	0.07M/ 0.2FT	20
ROATAN ISLAND HN	16.3N	86.5W	1748	0.08M/ 0.3FT	18
EL PORVENIR PA	9.6N	78.9W	1750	0.43M/ 1.4FT	18
SAN ANDRES CO	12.6N	81.7W	1742	0.34M/ 1.1FT	24
ILE ROYAL GUIANA FR	5.3N	52.6W	1741	0.74M/ 2.4FT	18
COVENAS CO	9.4N	76.2W	1743	0.42M/ 1.4FT	28
DART 44402	39.3N	70.7W	1729	0.09M/ 0.3FT	18
PORT ROYAL JM	17.9N	76.8W	1728	0.95M/ 3.1FT	20
PORT AU PRINCE HT	18.5N	72.4W	1718	0.72M/ 2.3FT	22
DART 44401	37.5N	50.0W	1710	0.15M/ 0.5FT	26
GEORGE TOWN CY	19.3N	81.4W	1707	0.13M/ 0.4FT	22
SANTA MARTA CO	11.2N	74.2W	1654	0.59M/ 1.9FT	24
PORT OF SPAIN TT	10.6N	61.5W	1641	1.16M/ 3.8FT	28
DART 41424	32.9N	72.5W	1647	0.07M/ 0.2FT	18
PUERTO ESTRELLA CO	12.4N	71.3W	1635	0.85M/ 2.8FT	14
BERMUDA UK	32.4N	64.7W	1622	0.75M/ 2.4FT	18
TORTOLA VI UK	18.4N	64.6W	1612	1.68M/ 5.5FT	24
PORT SAN ANDRES DO	18.4N	69.6W	1614	1.29M/ 4.2FT	26
JACMEL HT	18.2N	72.5W	1614	0.83M/ 2.7FT	22
BULLEN BAY CURACAO	12.2N	69.0W	1607	1.55M/ 5.1FT	22
BARAHONA DO	18.2N	71.1W	1600	0.90M/ 3.0FT	26
CAP HAITIEN HT	19.8N	72.2W	1548	0.41M/ 1.3FT	16
CHARLOTTEVILLE TT	11.3N	60.5W	1541	1.29M/ 4.2FT	22
SCARBOROUGH TT	11.2N	60.7W	1534	1.29M/ 4.2FT	26
DART 42407	15.3N	68.2W	1535	0.13M/ 0.4FT	22
MAGUEYES ISLAND PR	18.0N	67.0W	1531	1.25M/ 4.1FT	18
PUERTO PLATA DO	19.8N	70.7W	1535	0.57M/ 1.9FT	28
PUNTA CANA DO	18.5N	68.4W	1534	1.11M/ 3.6FT	24
PRICKLEY BAY GD	12.0N	61.8W	1527	1.82M/ 6.0FT	14
CAJA DE MUERTOS PR	17.9N	66.5W	1531	1.50M/ 4.9FT	26
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1527	1.68M/ 5.5FT	28

MONA ISLAND PR	18.1N	67.9W	1525	1.01M/ 3.3FT	28
SAINT MARTIN FR	18.1N	63.1W	1517	2.10M/ 6.9FT	22
DART 41420	23.5N	67.3W	1518	0.08M/ 0.3FT	16
AGUADILLA PR	18.5N	67.2W	1517	0.86M/ 2.8FT	28
MAYAGUEZ PR	18.2N	67.2W	1522	0.86M/ 2.8FT	22
ESPERANZA VIEQUES P	18.1N	65.5W	1513	1.47M/ 4.8FT	28
ARECIBO PR	18.5N	66.7W	1507	0.77M/ 2.5FT	16
YABUCOA PR	18.1N	65.8W	1507	1.90M/ 6.2FT	18
DART 41421	23.4N	63.9W	1503	0.16M/ 0.5FT	20
SAN JUAN PR	18.5N	66.1W	1500	0.89M/ 2.9FT	24
LIMETREE VI	17.7N	64.8W	1506	1.19M/ 3.9FT	26
CALLIAQUA VC	13.1N	61.2W	1502	1.56M/ 5.1FT	18
ST CROIX VI	17.7N	64.7W	1502	1.19M/ 3.9FT	26
BARBUDA AG	17.6N	61.8W	1455	4.26M/14.0FT	26
BRIDGEPORT BB	13.1N	59.6W	1501	2.08M/ 6.8FT	26
PORT ST CHARLES BB	13.3N	59.6W	1455	2.23M/ 7.3FT	20
BASSETERRE KN	17.3N	62.7W	1457	2.76M/ 9.1FT	22
FORT DE FRANCE MQ	14.6N	61.1W	1451	2.84M/ 9.3FT	22
LE ROBERT MARTINIQU	14.7N	60.9W	1441	2.84M/ 9.3FT	16
ROSEAU DM	15.3N	61.4W	1442	3.23M/10.6FT	24
LE PRECHEUR MARTINI	14.8N	61.2W	1442	2.62M/ 8.6FT	14
POINT A PITRE GP	16.2N	61.5W	1439	20.10M/65.9FT	20
DESHAIES GUADELOUPE	16.3N	61.8W	1427	6.35M/20.8FT	24
PARHAM AT	17.1N	61.8W	1430	12.98M/42.6FT	22
DESIRADE GUADELOUPE	16.3N	61.1W	1414	14.72M/48.3FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
---

* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

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NNNN

PTWC Message #7

ZCZC
WECA41 PHEB 211925
TSUCAX

TSUNAMI MESSAGE NUMBER 7
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
1925 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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* MAGNITUDE 8.5
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 17.0 NORTH 60.7 WEST
* DEPTH 40 KM / 25 MILES
* LOCATION LEEWARD ISLANDS

EVALUATION
---

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.5 OCCURRED IN THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.

* TSUNAMI WAVES HAVE BEEN OBSERVED.

* BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TSUNAMI THREAT FORECAST
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GUADELOUPE... MARTINIQUE... MONTSERRAT... SABA AND SAINT EUSTATIUS... AND SAINT KITTS AND NEVIS.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

DOMINICAN REPUBLIC... FRENCH GUYANE... GUYANA...
SURINAME... VENEZUELA... ANGUILLA... ARUBA... BERMUDA...
BONAIRE... CURACAO... GRENADA... PUERTO RICO AND VIRGIN
ISLANDS... SAINT BARTHELEMY... SAINT LUCIA... SINT
MAARTEN... SAINT MARTIN... SAINT VINCENT AND THE
GRENADINES... AND TRINIDAD AND TOBAGO.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

BRAZIL... COLOMBIA... COSTA RICA... CUBA... HAITI...
NICARAGUA... PANAMA... BAHAMAS... JAMAICA... SAN ANDRES
AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.
* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
PUNTO FIJO	VENEZUELA	11.7N 70.2W	1828 03/21
GEORGETOWN	GUYANA	6.8N 58.2W	1847 03/21
PUNTA GORDA	NICARAGUA	11.4N 83.8W	1855 03/21
PARAMARIBO	SURINAME	5.9N 55.2W	1904 03/21
PORLAMAR	VENEZUELA	10.9N 63.8W	1912 03/21
GOLFO VENEZUELA	VENEZUELA	11.4N 71.2W	1928 03/21
ILHA DE MARACA	BRAZIL	2.2N 50.5W	2147 03/21
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	2222 03/21

POTENTIAL IMPACTS
---

* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS
---

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
PALMEIRA CAPE VERDE	16.8N	23.0W	1924	1.72M/ 5.6FT	14
TELA HN	15.8N	87.5W	1915	0.09M/ 0.3FT	28
KEY WEST FL	24.6N	81.8W	1922	0.05M/ 0.2FT	24
PRAIA CV	14.9N	23.5W	1916	0.97M/ 3.2FT	28
MINDELO CV	16.9N	25.0W	1910	1.71M/ 5.6FT	28
VACA KEY FL	24.7N	81.1W	1900	0.05M/ 0.2FT	16
OREGON INLET NC	35.8N	75.5W	1850	0.85M/ 2.8FT	18
DUCK PIER NC	36.2N	75.7W	1833	0.76M/ 2.5FT	28
PUERTO MORELOS MX	21.4N	86.8W	1831	0.07M/ 0.2FT	26
ISLA MUJERES	21.2N	86.7W	1829	0.08M/ 0.3FT	28
BOCAS DEL TORO PA	9.4N	82.3W	1828	0.39M/ 1.3FT	26
CEIBA CABOTAGE HN	15.8N	86.8W	1828	0.08M/ 0.3FT	22
LIMON CR	10.0N	83.2W	1825	0.35M/ 1.1FT	28
CARRIE BOW CAY BH	16.8N	88.1W	1817	0.09M/ 0.3FT	24
PUERTO CORTES HN	15.8N	88.0W	1811	0.09M/ 0.3FT	20
PUERTO MORELOS MX	20.9N	86.9W	1800	0.10M/ 0.3FT	26
UTILA ISLAND HN	16.1N	86.9W	1757	0.09M/ 0.3FT	20
HATTERAS NC	35.2N	75.7W	1803	0.66M/ 2.2FT	16
SAPZURRO CO	8.7N	77.4W	1758	0.40M/ 1.3FT	20
VIRGINIA KEY FL	25.7N	80.2W	1756	0.07M/ 0.2FT	20
ROATAN ISLAND HN	16.3N	86.5W	1748	0.08M/ 0.3FT	18
EL PORVENIR PA	9.6N	78.9W	1750	0.43M/ 1.4FT	18
SAN ANDRES CO	12.6N	81.7W	1742	0.34M/ 1.1FT	24
ILE ROYAL GUIANA FR	5.3N	52.6W	1741	0.74M/ 2.4FT	18
COVENAS CO	9.4N	76.2W	1743	0.42M/ 1.4FT	28
DART 44402	39.3N	70.7W	1729	0.09M/ 0.3FT	18
PORT ROYAL JM	17.9N	76.8W	1728	0.95M/ 3.1FT	20
PORT AU PRINCE HT	18.5N	72.4W	1718	0.72M/ 2.3FT	22
DART 44401	37.5N	50.0W	1710	0.15M/ 0.5FT	26

GEORGE TOWN CY	19.3N	81.4W	1707	0.13M/ 0.4FT	22
SANTA MARTA CO	11.2N	74.2W	1654	0.59M/ 1.9FT	24
PORT OF SPAIN TT	10.6N	61.5W	1641	1.16M/ 3.8FT	28
DART 41424	32.9N	72.5W	1647	0.07M/ 0.2FT	18
PUERTO ESTRELLA CO	12.4N	71.3W	1635	0.85M/ 2.8FT	14
BERMUDA UK	32.4N	64.7W	1622	0.75M/ 2.4FT	18
TORTOLA VI UK	18.4N	64.6W	1612	1.68M/ 5.5FT	24
PORT SAN ANDRES DO	18.4N	69.6W	1614	1.29M/ 4.2FT	26
JACMEL HT	18.2N	72.5W	1614	0.83M/ 2.7FT	22
BULLEN BAY CURACAO	12.2N	69.0W	1607	1.55M/ 5.1FT	22
BARAHONA DO	18.2N	71.1W	1600	0.90M/ 3.0FT	26
CAP HAITIEN HT	19.8N	72.2W	1548	0.41M/ 1.3FT	16
CHARLOTTEVILLE TT	11.3N	60.5W	1541	1.29M/ 4.2FT	22
SCARBOROUGH TT	11.2N	60.7W	1534	1.29M/ 4.2FT	26
DART 42407	15.3N	68.2W	1535	0.13M/ 0.4FT	22
MAGUEYES ISLAND PR	18.0N	67.0W	1531	1.25M/ 4.1FT	18
PUERTO PLATA DO	19.8N	70.7W	1535	0.57M/ 1.9FT	28
PUNTA CANA DO	18.5N	68.4W	1534	1.11M/ 3.6FT	24
PRICKLEY BAY GD	12.0N	61.8W	1527	1.82M/ 6.0FT	14
CAJA DE MUERTOS PR	17.9N	66.5W	1531	1.50M/ 4.9FT	26
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1527	1.68M/ 5.5FT	28
MONA ISLAND PR	18.1N	67.9W	1525	1.01M/ 3.3FT	28
SAINT MARTIN FR	18.1N	63.1W	1517	2.10M/ 6.9FT	22
DART 41420	23.5N	67.3W	1518	0.08M/ 0.3FT	16
AGUADILLA PR	18.5N	67.2W	1517	0.86M/ 2.8FT	28
MAYAGUEZ PR	18.2N	67.2W	1522	0.86M/ 2.8FT	22
ESPERANZA VIEQUES P	18.1N	65.5W	1513	1.47M/ 4.8FT	28
ARECIBO PR	18.5N	66.7W	1507	0.77M/ 2.5FT	16
YABUCOA PR	18.1N	65.8W	1507	1.90M/ 6.2FT	18
DART 41421	23.4N	63.9W	1503	0.16M/ 0.5FT	20
SAN JUAN PR	18.5N	66.1W	1500	0.89M/ 2.9FT	24
LIMETREE VI	17.7N	64.8W	1506	1.19M/ 3.9FT	26
CALLIAQUA VC	13.1N	61.2W	1502	1.56M/ 5.1FT	18
ST CROIX VI	17.7N	64.7W	1502	1.19M/ 3.9FT	26
BARBUDA AG	17.6N	61.8W	1455	4.26M/14.0FT	26
BRIDGEPORT BB	13.1N	59.6W	1501	2.08M/ 6.8FT	26
PORT ST CHARLES BB	13.3N	59.6W	1455	2.23M/ 7.3FT	20
BASSETERRE KN	17.3N	62.7W	1457	2.76M/ 9.1FT	22
FORT DE FRANCE MQ	14.6N	61.1W	1451	2.84M/ 9.3FT	22
LE ROBERT MARTINIQU	14.7N	60.9W	1441	2.84M/ 9.3FT	16
ROSEAU DM	15.3N	61.4W	1442	3.23M/10.6FT	24
LE PRECHEUR MARTINI	14.8N	61.2W	1442	2.62M/ 8.6FT	14
POINT A PITRE GP	16.2N	61.5W	1439	20.10M/65.9FT	20
DESHAIES GUADELOUPE	16.3N	61.8W	1427	6.35M/20.8FT	24
PARHAM AT	17.1N	61.8W	1430	12.98M/42.6FT	22
DESIRADE GUADELOUPE	16.3N	61.1W	1414	14.72M/48.3FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
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* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

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  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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NNNN
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PTWC Message #8

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ZCZC
WECA41 PHEB 212025
TSUCAX

TSUNAMI MESSAGE NUMBER 8
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
2025 UTC TUE MAR 21 2017

...TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

 THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE
 UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR
 THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL
 AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

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 ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED
 INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
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  * MAGNITUDE      8.5
  * ORIGIN TIME    1400 UTC MAR 21 2017
  * COORDINATES    17.0 NORTH  60.7 WEST
  * DEPTH          40 KM / 25 MILES
  * LOCATION       LEEWARD ISLANDS

EVALUATION
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  * AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.5 OCCURRED IN
    THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.

  * TSUNAMI WAVES HAVE BEEN OBSERVED.

  * BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE
    FORECAST FOR SOME COASTS.
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TSUNAMI THREAT FORECAST
---

* TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GUADELOUPE... MARTINIQUE... MONTSERRAT... SABA AND SAINT EUSTATIUS... AND SAINT KITTS AND NEVIS.

* TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

  DOMINICAN REPUBLIC... FRENCH GUYANE... GUYANA... SURINAME... VENEZUELA... ANGUILLA... ARUBA... BERMUDA... BONAIRE... CURACAO... GRENADA... PUERTO RICO AND VIRGIN ISLANDS... SAINT BARTHELEMY... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN... SAINT VINCENT AND THE GRENADINES... AND TRINIDAD AND TOBAGO.

* TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

  BRAZIL... COLOMBIA... COSTA RICA... CUBA... HAITI... NICARAGUA... PANAMA... BAHAMAS... JAMAICA... SAN ANDRES AND PROVIDENCIA... AND TURKS AND CAICOS ISLANDS.

* ACTUAL AMPLITUDES AT THE COAST MAY VARY FROM FORECAST AMPLITUDES DUE TO UNCERTAINTIES IN THE FORECAST AND LOCAL FEATURES. IN PARTICULAR MAXIMUM TSUNAMI AMPLITUDES ON ATOLLS OR SMALL ISLANDS AND AT LOCATIONS WITH FRINGING OR BARRIER REEFS WILL LIKELY BE MUCH SMALLER THAN THE FORECAST INDICATES.

* FOR ALL OTHER AREAS COVERED BY THIS MESSAGE... THERE IS NO TSUNAMI THREAT ALTHOUGH SMALL SEA LEVEL CHANGES MAY OCCUR.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR THREATENED COASTAL AREAS SHOULD TAKE ACTION TO INFORM AND INSTRUCT ANY COASTAL POPULATIONS AT RISK IN ACCORDANCE WITH THEIR OWN EVALUATION... PROCEDURES AND THE LEVEL OF THREAT.

* PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

ESTIMATED TIMES OF ARRIVAL
---

* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN THREATENED REGIONS ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN WAVES CAN BE FIVE MINUTES TO ONE HOUR.

LOCATION	REGION	COORDINATES	ETA(UTC)
GOLFO VENEZUELA	VENEZUELA	11.4N 71.2W	1928 03/21
ILHA DE MARACA	BRAZIL	2.2N 50.5W	2147 03/21
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	2222 03/21

POTENTIAL IMPACTS

* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.

* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEPT OUT TO SEA.

TSUNAMI OBSERVATIONS

* THE FOLLOWING ARE TSUNAMI WAVE OBSERVATIONS FROM COASTAL AND/OR DEEP-OCEAN SEA LEVEL GAUGES AT THE INDICATED LOCATIONS. THE MAXIMUM TSUNAMI HEIGHT IS MEASURED WITH RESPECT TO THE NORMAL TIDE LEVEL.

	GAUGE COORDINATES		TIME OF MEASURE	MAXIMUM TSUNAMI	WAVE PERIOD
GAUGE LOCATION	LAT	LON	(UTC)	HEIGHT	(MIN)
POINT FORTIN TT	10.2N	61.4W	2018	1.37M/ 4.5FT	20
PONTA DELGADA PT	37.7N	25.7W	1956	1.70M/ 5.6FT	18
HORTA	38.5N	28.6W	1947	2.77M/ 9.1FT	28
SANTA MARIA	36.9N	25.1W	1951	1.96M/ 6.4FT	22
MONTAUK NY	41.0N	72.0W	1938	0.76M/ 2.5FT	28
FORTALEZA BR	3.7S	38.5W	1929	0.65M/ 2.1FT	24
PALMEIRA CAPE VERDE	16.8N	23.0W	1924	1.72M/ 5.6FT	14
TELA HN	15.8N	87.5W	1915	0.09M/ 0.3FT	28
KEY WEST FL	24.6N	81.8W	1922	0.05M/ 0.2FT	24
PRAIA CV	14.9N	23.5W	1916	0.97M/ 3.2FT	28
MINDELO CV	16.9N	25.0W	1910	1.71M/ 5.6FT	28
VACA KEY FL	24.7N	81.1W	1900	0.05M/ 0.2FT	16
OREGON INLET NC	35.8N	75.5W	1850	0.85M/ 2.8FT	18
DUCK PIER NC	36.2N	75.7W	1833	0.76M/ 2.5FT	28
PUERTO MORELOS MX	21.4N	86.8W	1831	0.07M/ 0.2FT	26
ISLA MUJERES	21.2N	86.7W	1829	0.08M/ 0.3FT	28
BOCAS DEL TORO PA	9.4N	82.3W	1828	0.39M/ 1.3FT	26
CEIBA CABOTAGE HN	15.8N	86.8W	1828	0.08M/ 0.3FT	22
LIMON CR	10.0N	83.2W	1825	0.35M/ 1.1FT	28
CARRIE BOW CAY BH	16.8N	88.1W	1817	0.09M/ 0.3FT	24
PUERTO CORTES HN	15.8N	88.0W	1811	0.09M/ 0.3FT	20
PUERTO MORELOS MX	20.9N	86.9W	1800	0.10M/ 0.3FT	26
UTILA ISLAND HN	16.1N	86.9W	1757	0.09M/ 0.3FT	20
HATTERAS NC	35.2N	75.7W	1803	0.66M/ 2.2FT	16

SAPZURRO CO	8.7N	77.4W	1758	0.40M/ 1.3FT	20
VIRGINIA KEY FL	25.7N	80.2W	1756	0.07M/ 0.2FT	20
ROATAN ISLAND HN	16.3N	86.5W	1748	0.08M/ 0.3FT	18
EL PORVENIR PA	9.6N	78.9W	1750	0.43M/ 1.4FT	18
SAN ANDRES CO	12.6N	81.7W	1742	0.34M/ 1.1FT	24
ILE ROYAL GUIANA FR	5.3N	52.6W	1741	0.74M/ 2.4FT	18
COVENAS CO	9.4N	76.2W	1743	0.42M/ 1.4FT	28
DART 44402	39.3N	70.7W	1729	0.09M/ 0.3FT	18
PORT ROYAL JM	17.9N	76.8W	1728	0.95M/ 3.1FT	20
PORT AU PRINCE HT	18.5N	72.4W	1718	0.72M/ 2.3FT	22
DART 44401	37.5N	50.0W	1710	0.15M/ 0.5FT	26
GEORGE TOWN CY	19.3N	81.4W	1707	0.13M/ 0.4FT	22
SANTA MARTA CO	11.2N	74.2W	1654	0.59M/ 1.9FT	24
PORT OF SPAIN TT	10.6N	61.5W	1641	1.16M/ 3.8FT	28
DART 41424	32.9N	72.5W	1647	0.07M/ 0.2FT	18
PUERTO ESTRELLA CO	12.4N	71.3W	1635	0.85M/ 2.8FT	14
BERMUDA UK	32.4N	64.7W	1622	0.75M/ 2.4FT	18
TORTOLA VI UK	18.4N	64.6W	1612	1.68M/ 5.5FT	24
PORT SAN ANDRES DO	18.4N	69.6W	1614	1.29M/ 4.2FT	26
JACMEL HT	18.2N	72.5W	1614	0.83M/ 2.7FT	22
BULLEN BAY CURACAO	12.2N	69.0W	1607	1.55M/ 5.1FT	22
BARAHONA DO	18.2N	71.1W	1600	0.90M/ 3.0FT	26
CAP HAITIEN HT	19.8N	72.2W	1548	0.41M/ 1.3FT	16
CHARLOTTEVILLE TT	11.3N	60.5W	1541	1.29M/ 4.2FT	22
SCARBOROUGH TT	11.2N	60.7W	1534	1.29M/ 4.2FT	26
DART 42407	15.3N	68.2W	1535	0.13M/ 0.4FT	22
MAGUEYES ISLAND PR	18.0N	67.0W	1531	1.25M/ 4.1FT	18
PUERTO PLATA DO	19.8N	70.7W	1535	0.57M/ 1.9FT	28
PUNTA CANA DO	18.5N	68.4W	1534	1.11M/ 3.6FT	24
PRICKLEY BAY GD	12.0N	61.8W	1527	1.82M/ 6.0FT	14
CAJA DE MUERTOS PR	17.9N	66.5W	1531	1.50M/ 4.9FT	26
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1527	1.68M/ 5.5FT	28
MONA ISLAND PR	18.1N	67.9W	1525	1.01M/ 3.3FT	28
SAINT MARTIN FR	18.1N	63.1W	1517	2.10M/ 6.9FT	22
DART 41420	23.5N	67.3W	1518	0.08M/ 0.3FT	16
AGUADILLA PR	18.5N	67.2W	1517	0.86M/ 2.8FT	28
MAYAGUEZ PR	18.2N	67.2W	1522	0.86M/ 2.8FT	22
ESPERANZA VIEQUES P	18.1N	65.5W	1513	1.47M/ 4.8FT	28
ARECIBO PR	18.5N	66.7W	1507	0.77M/ 2.5FT	16
YABUCOA PR	18.1N	65.8W	1507	1.90M/ 6.2FT	18
DART 41421	23.4N	63.9W	1503	0.16M/ 0.5FT	20
SAN JUAN PR	18.5N	66.1W	1500	0.89M/ 2.9FT	24
LIMETREE VI	17.7N	64.8W	1506	1.19M/ 3.9FT	26
CALLIAQUA VC	13.1N	61.2W	1502	1.56M/ 5.1FT	18
ST CROIX VI	17.7N	64.7W	1502	1.19M/ 3.9FT	26
BARBUDA AG	17.6N	61.8W	1455	4.26M/14.0FT	26
BRIDGEPORT BB	13.1N	59.6W	1501	2.08M/ 6.8FT	26
PORT ST CHARLES BB	13.3N	59.6W	1455	2.23M/ 7.3FT	20
BASSETERRE KN	17.3N	62.7W	1457	2.76M/ 9.1FT	22
FORT DE FRANCE MQ	14.6N	61.1W	1451	2.84M/ 9.3FT	22
LE ROBERT MARTINIQU	14.7N	60.9W	1441	2.84M/ 9.3FT	16
ROSEAU DM	15.3N	61.4W	1442	3.23M/10.6FT	24
LE PRECHEUR MARTINI	14.8N	61.2W	1442	2.62M/ 8.6FT	14
POINT A PITRE GP	16.2N	61.5W	1439	20.10M/65.9FT	20
DESHAIES GUADELOUPE	16.3N	61.8W	1427	6.35M/20.8FT	24
PARHAM AT	17.1N	61.8W	1430	12.98M/42.6FT	22
DESIRADE GUADELOUPE	16.3N	61.1W	1414	14.72M/48.3FT	16

NEXT UPDATE AND ADDITIONAL INFORMATION
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* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT NTWC.ARH.NOAA.GOV.

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NNNN

PTWC Message #9

ZCZC
WECA41 PHEB 212125
TSUCAX

TSUNAMI MESSAGE NUMBER 9
NWS PACIFIC TSUNAMI WARNING CENTER EWA BEACH HI
2125 UTC TUE MAR 21 2017

...FINAL TSUNAMI THREAT MESSAGE...

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

THIS MESSAGE IS ISSUED FOR INFORMATION ONLY IN SUPPORT OF THE UNESCO/IOC TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS AND IS MEANT FOR NATIONAL AUTHORITIES IN EACH COUNTRY OF THAT SYSTEM.

NATIONAL AUTHORITIES WILL DETERMINE THE APPROPRIATE LEVEL OF ALERT FOR EACH COUNTRY AND MAY ISSUE ADDITIONAL OR MORE REFINED INFORMATION.

**** NOTICE **** NOTICE **** NOTICE **** NOTICE **** NOTICE *****

PRELIMINARY EARTHQUAKE PARAMETERS
---

* MAGNITUDE 8.5
* ORIGIN TIME 1400 UTC MAR 21 2017
* COORDINATES 17.0 NORTH 60.7 WEST
* DEPTH 40 KM / 25 MILES
* LOCATION LEEWARD ISLANDS

EVALUATION
---

* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.5 OCCURRED IN THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.

* BASED ON ALL AVAILABLE DATA... THE TSUNAMI THREAT FROM THIS EARTHQUAKE HAS PASSED AND THERE IS NO FURTHER THREAT.

TSUNAMI THREAT FORECAST...UPDATED
---

* THE TSUNAMI THREAT HAS NOW LARGELY PASSED.

RECOMMENDED ACTIONS
---

* GOVERNMENT AGENCIES RESPONSIBLE FOR ANY IMPACTED COASTAL AREAS SHOULD MONITOR CONDITIONS AT THE COAST TO DETERMINE IF AND WHEN IT IS SAFE TO RESUME NORMAL ACTIVITIES.

* PERSONS LOCATED NEAR IMPACTED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM LOCAL AUTHORITIES.

* REMAIN OBSERVANT AND EXERCISE NORMAL CAUTION NEAR THE SEA.

POTENTIAL IMPACTS
---

* MINOR SEA LEVEL FLUCTUATIONS UP TO 30 CM ABOVE AND BELOW THE NORMAL TIDE MAY OCCUR IN COASTAL AREAS NEAR THE EARTHQUAKE OVER THE NEXT FEW HOURS.... AND CONTINUING FOR UP TO SEVERAL HOURS.

NEXT UPDATE AND ADDITIONAL INFORMATION
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* THIS WILL BE THE FINAL STATEMENT ISSUED FOR THIS EVENT UNLESS NEW INFORMATION IS RECEIVED OR THE SITUATION CHANGES.

* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV/EARTHQUAKES -ALL IN LOWERCASE LETTERS-.

* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT PTWC.WEATHER.GOV AND AT WWW.TSUNAMI.GOV.

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  * COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS...
    AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC
    TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE
    PLACES THAT CAN BE FOUND AT PTWC.WEATHER.GOV.

  * COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND
    THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S.
    NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND
    AT NTWC.ARH.NOAA.GOV.

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NNNN
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Annex G. 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 21, 2017

(*insert community/county/state name*) will join other localities in the Caribbean as a participant in a tsunami response exercise on March 21, 2017. 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 2010, 2014, 2015 Chilean 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 17, will simulate a widespread Tsunami Warning and Watch situation throughout the Caribbean, which requires implementation of local tsunami response, plans. The exercise will (*insert "include" or "not include")* public notification.

The exercise will simulate a major earthquake and tsunami generated (*insert description of chosen escenario - source and appropriate local time*) on March 21, 2017. A handbook has been prepared which describes the scenario and contains tsunami messages from the Pacific Tsunami Warning Center (PTWC). The PTWC is the interim Regional Tsunami Service 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), and the U.S. National Oceanic and Atmospheric Administration (NOAA).

For more information on the U.S. tsunami warning system, see www.tsunami.gov.

For more information on the ICG/CARIBE-EWS, see http://ioc-tsunami.org/index.php?option=com_oe&task=viewEventRecord&eventID=1912.

###

On the Web:

ICG/CARIBE EWS	http://www.ioc-tsunami.org
Pacific Tsunami Warning Center	http://ptwc.weather.gov
NOAA Tsunami Program	http://www.tsunami.gov
Caribbean Tsunami Warning Program	http://caribewave.info
Insert state/local emergency response URLs	

IOC Technical Series

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
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

(continued)

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 (8th 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 (9th 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 (10th training-through-research cruise, July-August 2000). 2001	E only
61	Forecasting Ocean Science? Pros and Cons, Potsdam Lecture, 1999. 2002	E only
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 2013–2017 (Version 2.0). 2013	E only
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	*Electronic publication*

(continued)

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. 3 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)	E only
95.	International Post-Tsunami Survey for the 25 October 2010 Mentawai, Indonesia Tsunami	E only
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	E only
97.	Exercise PACIFIC WAVE 11: A Pacific-wide Tsunami Warning and Communication Exercise, 9–10 November 2011	
	Vol. 1 Exercise Manual. 2011	E only
	Vol. 2 Report. 2013	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
99.	Exercise INDIAN OCEAN WAVE 2011 – An Indian Ocean-wide Tsunami Warning and Communication Exercise, 12 October 2011	E only
	Vol. 1 Exercise Manual. 2011 Supplement: Bulletins from the Regional Tsunami Service Providers	
	Vol. 2 Exercise Report. 2013	
100.	Global Sea Level Observing System (GLOSS) Implementation Plan – 2012. 2012	E only
101.	Exercise Caribe Wave/Lantex 13. A Caribbean Tsunami Warning Exercise, 20 March 2013. Volume 1: Participant Handbook. 2012	E only
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