



## EXERCISE CARIBE WAVE 22

### A Caribbean and Adjacent Region Tsunami Warning Exercise

10 March 2022

(Western Muertos Trough  
& Northern Panama Scenarios)

Volume 1

Participant Handbook



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## TABLE OF CONTENTS

	page
<b>Summary.....</b>	<b>(iii)</b>
<b>1. BACKGROUND.....</b>	<b>1</b>
1.1. EXERCISE JUSTIFICATION AND FRAMEWORK.....	1
1.2. EXERCISE EARTHQUAKE AND TSUNAMI SCENARIOS .....	2
<b>1.2.1 Caribbean Tectonics .....</b>	<b>3</b>
<b>1.2.2 Western Muertos Trough Scenario.....</b>	<b>3</b>
<b>1.2.3 Northern Panama Scenario .....</b>	<b>4</b>
<b>1.2.4 Cumbre Vieja Scenario .....</b>	<b>4</b>
<b>1.2.5 Earthquake impact .....</b>	<b>5</b>
<b>2. EXERCISE CONCEPT .....</b>	<b>5</b>
2.1 PURPOSE.....	5
2.2 OBJECTIVES.....	5
2.3 TYPE OF EXERCISES .....	6
2.4 TIMELINE .....	8
<b>3. PTWC PRODUCTS.....</b>	<b>8</b>
<b>4. EXERCISE OUTLINE .....</b>	<b>9</b>
4.1 GENERAL .....	9
4.2 MASTER SCHEDULE (EXERCISE SCRIPT) .....	10
<b>4.2.1 Western Muertos Trough Scenario.....</b>	<b>10</b>
<b>4.2.2 Northern Panama Scenario .....</b>	<b>11</b>
4.3 ACTIONS IN CASE OF EMERGENCY.....	12
4.4 RESOURCES .....	12
4.5 COMMUNITY REGISTRATION.....	12
4.6 MEDIA ARRANGEMENTS.....	12
4.7 PROCEDURE FOR FALSE ALARM .....	14
<b>5. POST-EXERCISE EVALUATION .....</b>	<b>14</b>
<b>6. REFERENCES.....</b>	<b>14</b>

## **ANNEXES**

- I. [STANDARD OPERATING PROCEDURES](#)
- II. [MANUAL AND GUIDES: MULTI-ANNUAL COMMUNITY TSUNAMI EXERCISE PROGRAMME GUIDELINES FOR THE TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE CARIBBEAN AND ADJACENT REGIONS](#)
- III. [TSUNAMI SOURCE SCENARIOS DESCRIPTION](#)
- IV. [EARTHQUAKE IMPACT SCENARIOS](#)
- V. [PTWC DUMMY \(START OF EXERCISE\) MESSAGES](#)
- VI. [PTWC EXERCISE MESSAGES](#)
- VII. [SAMPLE PRESS RELEASE FOR LOCAL MEDIA](#)
- VIII. [LIST OF ACRONYMS](#)

## **Summary**

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The Intergovernmental Coordination Group for Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS) of the Intergovernmental Oceanographic Commission (IOC) of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) will be conducting a tsunami exercise on 10 March 2022. This exercise will be coordinated together with the U.S. National Oceanic and Atmospheric Administration (NOAA) and the Caribbean regional emergency management stakeholders (CEPREDENAC [Coordination Centre for the Prevention of Natural Disasters in Central America], CDEMA [Caribbean Disaster Emergency Management Agency], and EMIZA [Etat-Major Interministériel de la Zone de Défense et de Sécurité Antilles]) with the purpose of assisting tsunami preparedness efforts in the Caribbean.

Considering the ongoing coronavirus emergency implications, the CARIBE WAVE plans on carrying exercises at various scales to advance tsunami preparedness in the Caribbean and Adjacent Regions. It is up to the Member States and Territories to decide if any additional Warning System activity would be executed and whether to use the simulated messages for one of the two scenarios planned for this exercise: Western Muertos Trough and Northern Panama. The first scenario described in this handbook simulates a tsunami generated by a magnitude 8.0 earthquake located along the Western portion of Muertos Trough (MT). The second scenario is a tsunami generated by a magnitude 8.3 earthquake located in the North Panama Deformed Belt (NPDB).

The Pacific Tsunami Warning Center (PTWC), the CARIBE-EWS Tsunami Service Provider, will issue the initial dummy message for the two scenarios on 10 March 2022 at 1400 UTC and will disseminate it over all its standard broadcast channels. The dummy message is issued to test communications between the PTWC and the officially designated Tsunami Warning Focal Points (TWFPs) and National Tsunami Warning Centers (NTWCs), and to start the exercise. As of 1407 UTC, the PTWC will send by email 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 the tsunami and earthquake scenarios information, timelines, PTWC dummy message and simulated exercise messages. High levels of vulnerability and risk to life and livelihoods from tsunamis along the coasts of the Caribbean and adjacent regions 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 annual tsunami exercise is being conducted to assist tsunami preparedness efforts throughout the Caribbean and adjacent regions. Recent tsunamis, such as those in the Indian Ocean (2004, 2018), Samoa (2009), Haiti (2010), Chile (2010, 2014, 2015), Japan (2011), Honduras (2018) and New Zealand (2021), 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 from the years 1530 to 2020 tsunamis from earthquake, landslide, and volcanic sources have all impacted the region (Figure 1). According to NCEI, in the past 500 years, over 83 tsunamis have been observed (7-10% world's oceanic tsunamis) and approximately 4,500 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 once about every 50 years during the past five centuries. Within the region, there are multiple fault segments and submarine features that could be the source of earthquake and landslide generated tsunamis. No fewer than four major plates (North America, South America, Nazca, and Cocos) border the perimeter of the Caribbean plate. Subduction occurs along the Eastern and Northeastern Atlantic margins of the Caribbean plate. While the Northern and Southern Caribbean plate boundaries are characterized with a predominant strike-slip displacement, the Eastern and Western boundaries mark locations where oceanic crust subducts beneath Caribbean plate lithosphere (Benz et al, 2011). In addition to the local and regional earthquake sources, the region is also threatened by teletsunamis/transatlantic tsunamis, like the 1755 Portugal event. Furthermore, six confirmed volcano tsunami source events and two landslides generated from volcanos have affected the Caribbean and adjacent regions (International Tsunami Information Center [ITIC] and National Centers for Environmental Information [NCEI], 2018).

Tsunami services for the Caribbean and adjacent regions within the UNESCO/IOC CARIBE-EWS framework are currently provided by the PTWC in Hawaii. It issues its messages two to ten minutes after an earthquake's occurrence. The PTWC international products include tsunami information and threat messages. Primary recipients of the PTWC messages include TWFPs and NTWCs. These agencies are responsible to determine and issue the corresponding alerts within their area of responsibility according to established protocols.

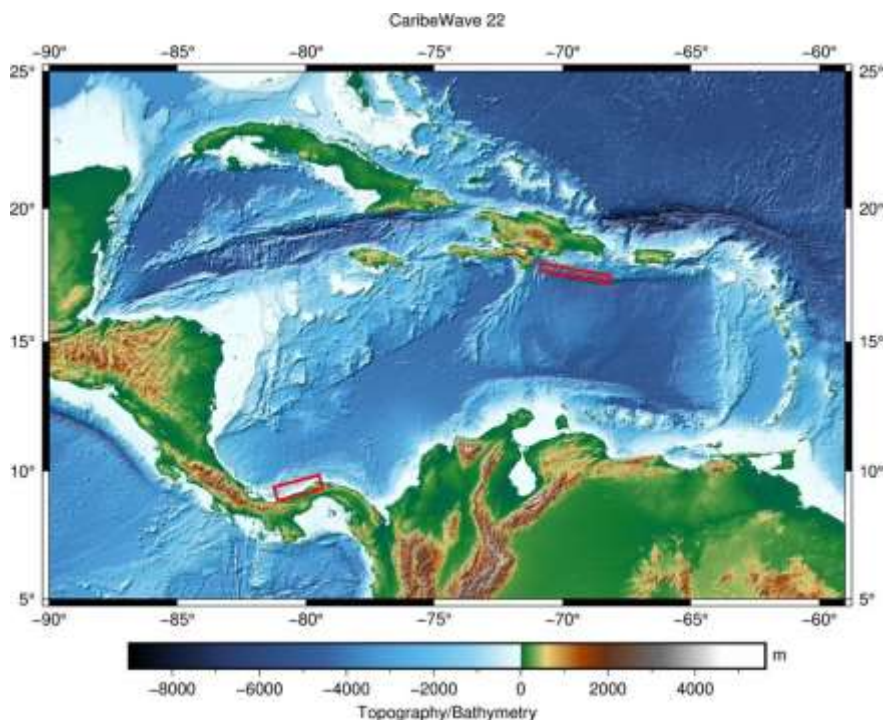
Nearly 160 million people live in the Caribbean, Central America and Northern South America. The question is not if another major tsunami will happen, but when it happens, will the region be prepared for the impact? The risk of tsunamis in the Caribbean is real and should be taken seriously and Member States need to exercise their Standard Operational Procedures for tsunamis to ensure readiness for when the next tsunami strikes.



**Figure 1.** Map of historical tsunamis (1530 to 2020) in the Caribbean, Central America, Mexico and adjacent regions (National Centers for Environmental Information, <https://www.ngdc.noaa.gov/hazard/data/publications/CCAMAR-english.pdf>).

## 1.2. EXERCISE EARTHQUAKE AND TSUNAMI SCENARIOS

The exercise CARIBE WAVE 22 will provide simulated tsunami threat messages issued from the PTWC based on two hypothetical scenarios: a magnitude 8.0 earthquake located on the Western Muertos Trough and a magnitude 8.3 earthquake located along the North Panama Deformed Belt (Figure 2). A third scenario was considered for the exercise, but given its ongoing volcanic activity in the area, it was decided to only include information on Cumbre Vieja. Below is a description of the proposed scenarios for the exercise.



**Figure 2.** Map of the CARIBE WAVE 22 scenarios. The red boxes indicate the map view of the ruptured fault segments. This figure was generated using PyGMT (Uieda et al., 2021) and GEBCO 2021 background model (GEBCO, 2021).



### 1.2.1 Caribbean Tectonics

Extensive diversity and complexity of tectonic regimes characterizes the perimeter of the Caribbean plate, involving no fewer than four major plates (North America, South America, Nazca, and Cocos). Northern and southern boundaries of the Caribbean are mostly characterized by strike-slip motion, whereas subduction zones occur at both eastern and western boundaries. Intermediate and deep earthquakes, Wadati-Benioff zones, ocean trenches, and arcs of volcanoes clearly indicate subduction of oceanic lithosphere along the Central American and Atlantic Ocean margins of the Caribbean plate. Along the northeastern Caribbean plate boundary zone, from the Island of Hispaniola to the Island of Barbuda, relative motion between the North America plate and the Caribbean plate becomes increasingly complex and is partially accommodated by nearly arc-parallel subduction of the North America plate beneath the Caribbean plate (Feuillet et al, 2002). Moving east and south to the northern Lesser Antilles where the plate motion vector of the Caribbean plate relative to the North and South America plates is less oblique, resulting in active island-arc tectonics. The North and South America plates subducts towards the west beneath the Caribbean plate along the Lesser Antilles Trench at rates of approximately 20 mm/yr. (DeMets et al. 2010). As a result of this subduction, there exists both intermediate focus earthquakes within the subducted plates and a chain of active volcanoes along the island arc, data that has been used to divide the arc into a northern and southern arc. Along the southern Lesser Antilles trench, the accretionary prism is anomalously thick and wide, raising the earthquake and tsunami potential. Farther west, the Southern Caribbean Deformed Belt (SCDB) has been developed due to the southward-verging under-thrusting of Caribbean lithosphere beneath the northern coast of South America (DeMets et al. 2010). The following two sub-sections describe the CARIBE WAVE 22 scenarios and present a justification on their tsunamigenic potential regardless of their probability of occurrence.

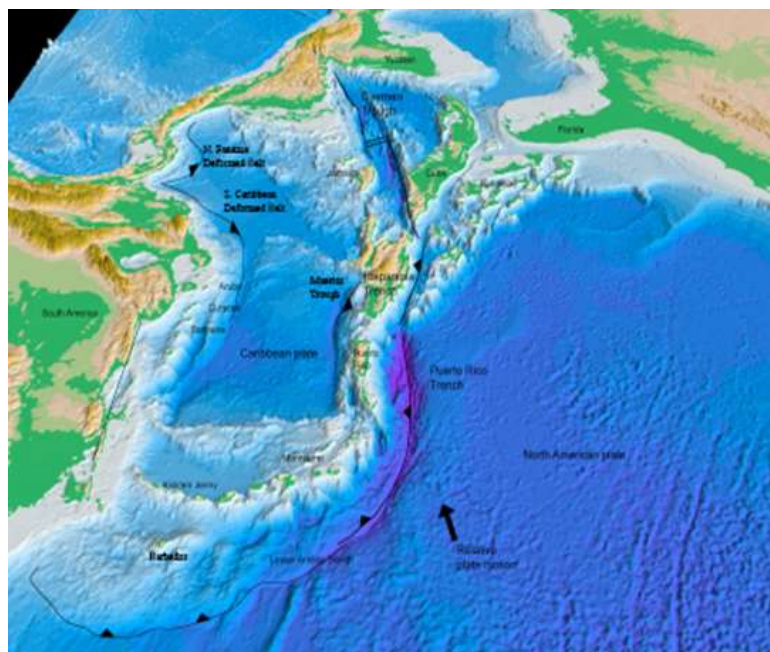


Figure 3. Major Tectonic features in the Caribbean ([ten Brink et al., 2008](#)).

### 1.2.2 Western Muertos Trough Scenario

The Muertos convergent margin, located south of Hispaniola and Puerto Rico, comprises the Muertos Thrust Belt (MTB) and the Muertos Trough (MT). It formed as a result of the oblique subduction between the Caribbean and North American plates and the collision of the Bahamas bank and Hispaniola (Granja Bruña et al., 2009). The MTB is described as an

asymmetric retro wedge in which its southern segments have active accretion processes and its width and convergence decreases towards the east (IOC Workshop Reports, 276; Granja Bruña et al., 2009). The MT is a 650 km east-west trending depression and convergent boundary, with no associated subduction, that defines the boundary between the interior of the Caribbean plate and the eastern Greater Antilles (IOC Workshop Reports, 276). It was formed along the base of the MTB and runs from the Beata Ridge in the west and the Aves Ridge in the east. The western region of the trough, south of Hispaniola, has a more active zone of thrusting, higher probability of a large earthquake to occur, is deeper and has thinner sediment fills relative to the eastern trough region, south of Puerto Rico (Granja Bruña et al., 2009; ten Brink et al., 2009). Events potentially associated with this structure include the 18 October 1751,  $M_l$  7.4-7.5 and the 24 June 1984,  $M_s$  6.7 earthquakes that caused damage in Hispaniola (Bakun et al., 2012; Granja Bruña et al., 2014). Tectonic sources from the Muertos convergent margin have been studied as one of the tsunami sources that could impact southern Hispaniola. A 290 km rupture area of the MT's western region can generate an  $M_w$  8.0 event, while smaller rupture areas can generate  $M_w$  7.6 and 7.7 events. Considering historical records of earthquakes and tsunamis affecting Hispaniola, the location of the MT, and the previously mentioned potential tectonic sources relative to the south of Hispaniola, the western segment of the MT is the one of interest for this CARIBE WAVE exercise.

### **1.2.3 Northern Panama Scenario**

The North Panama Deformed Belt (NPDB) is an arcuate-shaped thrust belt located offshore north of Panama that can produce tsunamigenic earthquakes. The NPDB is conformed by a submarine fold and thrust belt that extends offshore with an arcuate shape from the Gulf of Urabá in the Panama-Colombia border up to the shore northwest of Puerto Limón in Costa Rica (Camacho & Viquez, 1992). One of the largest events produced by the NPDB occurred on 7 September 1882, where approximately 100 people were drowned in a tsunami that submerged the islands of the San Blas Archipelago and the northern coast of Panama (ten Brink et al., 2008). The offshore earthquake had an estimated magnitude of  $M$  8 and was located  $10^{\circ}\text{N}$ ,  $78^{\circ}\text{W}$  (Mendoza and Nishenko, 1989). The maximum reported wave height was 3 meters according to the NOAA National Centers for Environmental Information (2018). Another known event occurred the 22 April 1991, where an  $M_w$  7.6 earthquake was located  $10.10^{\circ}\text{N}$ ,  $82.77^{\circ}\text{W}$  offshore Costa Rica at a depth of 15 km (Plafker and Ward, 1992). A tsunami was generated after the earthquake with a wave height of 3 m and affected the coast of Central America from north of Limón, Costa Rica to Panama. Oscillations of 7 cm were observed on tide gauges as far as Puerto Rico and St. Croix (Lander et al., 2002; NOAA National Centers for Environmental Information, 2018). Recent research has studied the potential tsunami threat from rupture zones in the NPDB and adjacent structures. Seismic sources and tsunami modeling results point to a potential high deformation and increased tsunami wave heights from the NPDB that could affect coastal communities in Costa Rica, Nicaragua, Panamá and Colombia (Zamora et al, 2021).

### **1.2.4 Cumbre Vieja Scenario**

Originally one of the scenarios was going to be a flank collapse of Cumbre Vieja Volcano. Nevertheless, considering the ongoing eruptive activity (Torres-González, et al, 2020), it was decided to not include this scenario for CARIBE WAVE 22 exercise.

### **1.2.5 Earthquake impact**

In addition to knowing the potential impact from the tsunami, it is also important to consider the potential of earthquake impact. The United States Geological Survey (USGS) provided for CARIBE WAVE 22 the scenario outputs of their ShakeMap and the Prompt Assessment of Global Earthquakes for Response (PAGER) products. These results provide emergency responders, government, aid agencies and the media the scope of the potential earthquake

related disaster. ShakeMap illustrates the ground shaking levels close to the earthquake source depending on a set of parameters such as distance to the source, rock and soil behavior, and seismic wave propagation through the crust (<https://earthquake.usgs.gov/data/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 (<https://earthquake.usgs.gov/data/pager/>). For the CARIBE WAVE 22 scenarios, 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 country that is going to receive the greatest impact from the magnitude 8.0 earthquake is Dominican Republic for the Western Muertos Trough scenario. The greatest shaking impact from the magnitude 8.3 earthquake associated with the North Panama Deformed Belt will be in Panama. Complete information about the ShakeMap and PAGER output for the exercise scenarios, are available in the [Annex IV](#) of this handbook.

## 2. EXERCISE CONCEPT

### 2.1 PURPOSE

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

### 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 to exercise and evaluate operations of the CARIBE-EWS Tsunami Warning System.

1. **Exercise and evaluate communications between Regional Tsunami Service Provider and Members States/Territories.**
  - 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 Centres (NTWCs).
2. **Evaluate the tsunami procedures and programmes within Members States/Territories.**
  - A. Validate **readiness** to respond to a tsunami.
  - B. Validate the **operational readiness** of the TWFPs/NTWCs and/or the National Disaster Management Office (NDMO).
  - C. Improve **operational readiness**. Before the exercise, ensure appropriate tools and response plan(s) have been developed, including public education materials.

- D. 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.
- E. Evaluate the status of the implementation of the pilot CARIBE-EWS Tsunami Ready recognition programme.

### 2.3 TYPE OF EXERCISES

The CARIBE WAVE exercise is planned for Caribbean countries to carry exercises at various scales of magnitudes and sophistication. In light of current implications due to the coronavirus pandemic, it is up for every country to decide at what scale the exercise should be carried out. Past exercises were executed 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. At the national/territorial level, a communication test is recommended to validate the receipt and dissemination of the messages distributed by the Pacific Tsunami Warning Center (PTWC).

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, 2014, 2015 and 2017, and should use the materials and expertise acquired to help guide exercise preparation and conduct. [Annex I](#) gives an overview of SOPs. Exercise participants may use their own past multi-hazard drills (e.g. flood, hurricane, tsunami, earthquake, etc.) as a framework to conduct CARIBE WAVE 22.

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

- **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.
- **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.
- **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 II](#) for an Exercise Guidelines).
- **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.

- 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.

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

Table 1. Example of time frames for different exercise types

Another good resource for exercise planning and conduct is the document entitled *Multi-Annual Community Tsunami Exercise Programme Guidelines for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions* (IOC Manual and Guides 86, Appendix II). This guide provides guidance on how to plan, conduct, and evaluate a multiannual local tsunami exercise programme. It has been designed by Member States of the Intergovernmental Oceanographic Commission for the use of their coastal communities who should participate in multiannual exercises. The guide is divided into four sections which provide a range of practical advice and templates for community stakeholders an in-country exercise developer. It highlights that a progressive and long-term approach is needed for tsunami exercises.

According to the Development Dialogue (2021), persons with disabilities make up 15% of the world’s population. This group of people are disproportionately affected by disaster impacts and are often not included in prevention, response, and recovery. It is important to engage persons with disabilities and their representative organizations in annual exercises such as CARIBE WAVE. Cutting-edge technology aimed at co-creating early warning and preparedness solutions that are inclusive and accessible to people with disabilities are suggested to be tested during the tsunami exercise to address this barrier.



## 2.4 TIMELINE

The process of planning CARIBE WAVE 22 takes more than a year; from the decision of the Intergovernmental Coordination Group (ICG) to conduct the exercise and the choice of the scenario(s) until the final reports are prepared and distributed. Listed below are the actions to be taken before, during and after CARIBE WAVE 22.

Action	Due date
Circular Letter Issued by IOC to Member States	December 2021
Handbook Draft Circulated among ICG CARIBE-EWS TNC/TWFP and TT CARIBE WAVE 22	December 2021
Deadline for Comments	December 2021
Exercise Handbook available online	January 2022
First Webinar CW 2022	18 Jan. 2022 - English 19 Jan. 2022 - Spanish 20 Jan. 2022 - French
Second Webinar CW 2022	15 Feb. 2022 - English 16 Feb. 2022 - Spanish 17 Feb. 2022 - French
Countries Indicate Selected Scenario	25 February 2022
Exercise	10 March 2022
Hot-Wash	22 March 2022
Exercise Evaluation Due	31 March 2022
Final Draft CARIBE WAVE 22 Report	13 April 2022

Table 2. Actions to be taken before, during and after CARIBE WAVE 22

## 3. PTWC PRODUCTS

On 1 March 2016, the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE-EWS) fully transitioned to the PTWC Enhanced Products. The PTWC only issues Information and Threat messages for the Caribbean. While the first threat message is based on earthquake location, magnitude and travel time thresholds, as of the second threat message, for earthquake generated tsunamis, these products include wave forecasts. 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 provide some advance notice of the threat 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 Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE-EWS)*** (<https://unesdoc.unesco.org/ark:/48223/pf0000259725>). As an additional planning tool, videos on the PTWC Enhanced Products and Staging for the Caribbean and Pacific were developed in English by ITIC (<https://vimeo.com/showcase/8956022>). To request access password, email [christa.vonh@noaa.gov](mailto:christa.vonh@noaa.gov). For the CARIBE WAVE 22, threat messages and enhanced graphical products of 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 [Annex III](#) and [VI](#). It is up to each country and territory to decide if and how to disseminate messages within its areas of responsibility.

## 4. EXERCISE OUTLINE

### 4.1 GENERAL

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

Western Muertos Trough Earthquake Scenario:

Origin Time	14:00:00 UTC March 10, 2022
Latitude	17.58°N
Longitude	69.50°W
Magnitude	8.0 – Mw
Depth	2.5 km

Northern Panama Earthquake Scenario:

Origin Time	14:00:00 UTC March 10, 2022
Latitude	9.35°N
Longitude	80.30°W
Magnitude	8.3 – Mw
Depth	25 km

Expected impacts for these events are determined from pre-computed tsunami forecast models. The models indicate significant tsunamis along many coasts in the Caribbean Sea. [Annex III](#) provides the model results for the Western Muertos Trough and Northern Panama scenarios.

The first simulated tsunami threat message issued by PTWC is based on the earthquake magnitude and location and the tsunami travel times. As of the second message tsunami wave forecasts are included. 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. The threat information is updated usually within an hour. All simulated products (text and graphical) for the scenario 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 PTWC will not issue live messages over broadcast dissemination channels other than to issue initial dummy message to start the exercise on 10 March 2022 at 1400 UTC. The initial dummy message will be disseminated over all standard PTWC broadcast channels. The World Meteorological Organization (WMO) and Advanced Weather Interactive Processing System (AWIPS) headers to be used in the dummy message are listed in Table 3. 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 V](#).

The GEONETCast is one of the different methods in which the dummy message can be received by the TWFPs and NTWCs. It is an operational service used to deliver data and products based on the use of communication satellites (Moura, 2006). GEONETCast has become an important data source to the Meteorological community and a wide variety of users that deal with environmental analysis (Maathuis, 2008). It is crucial that for CARIBE WAVE exercises, these methods are put into test.

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

Table 3. Product Types Issued for Dummy Message with Transmission Methods

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

Each Member State needs to select one scenario for CARIBE WAVE 22. By 25 February 2022, they must complete the following survey ([https://www.surveymonkey.com/r/CW22\\_ScenarioSelection](https://www.surveymonkey.com/r/CW22_ScenarioSelection)) to select the scenario their country will use for the exercise. If the Member State does not inform the PTWC and ITIC-CAR, 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.

Participants should follow the schedule in Tables 4 and 5 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 V](#)) cover a period of time between 7 minutes and 9-hours from earthquake origin time, however in an actual event messages would likely continue for a much longer period of time.

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 VI](#), 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 Western Muertos Trough Scenario

Tsunami generated by a magnitude 8.0 earthquake with epicenter at 17.58°N, 69.50°W occurring the 10 March 2022 at 1400 UTC. The initial alert is disseminated at 1407 UTC.



Date	Time (UTC)	PTWC	
		Type of Product	Transmission Method
3/10/22	1400	---- Earthquake Occurs ----	
3/10/22	1400	Dummy	NWWS, GTS, EMWIN, AISR, Fax, Email
3/10/22	1407	Initial Tsunami Threat Message #1	Email
3/10/22	1430	Tsunami Threat Message #2 with Forecast and Graphical Enhanced Products	Email
3/10/22	1500	Tsunami Threat Message #3 Supplement with Observations	Email
3/10/22	1600	Tsunami threat Message #4 Supplement with Observations	Email
3/10/22	1700	Tsunami Threat Message #5 Supplement with Observations	Email
3/10/22	1800	Tsunami Threat Message #6 Supplement with Observations	Email
3/10/22	1900	Tsunami Threat Message #7 Supplement with Observations	Email
3/10/22	2000	Final Tsunami Threat Message #8	Email

Table 4. Timeline Messages issued by PTWC

#### 4.2.2 Northern Panama Scenario

Tsunami generated by a magnitude 8.3 earthquake with epicenter at 9.35°N, 80.30°W occurring the 10 March 2022 at 1400 UTC. The initial alert is disseminated at 1407 UTC.

Date	Time (UTC)	PTWC	
		Type of Product	Transmission Method
3/10/22	1400	---- Earthquake Occurs ----	
3/10/22	1400	Dummy	NWWS, GTS, EMWIN, AISR, Fax, Email
3/10/22	1407	Initial Tsunami Threat Message #1	Email
3/10/22	1430	Tsunami Threat Message # 2 with Forecast and Graphical Enhanced Products	Email
3/10/22	1500	Tsunami Threat Message #3 Supplement with Observations	Email

Date	Time (UTC)	PTWC	
		Type of Product	Transmission Method
3/10/22	1600	Tsunami Threat Message #4 Supplement with Observations	Email
3/10/22	1700	Tsunami Threat Message #5 Supplement with Observations	Email
3/10/22	1800	Tsunami Threat Message #6 Supplement with Observations	Email
3/10/22	1900	Tsunami Threat Message #7 Supplement with Observations	Email
3/10/22	2000	Final Tsunami Threat Message #8	Email

Table 5. Timeline Messages issued by PTWC

#### 4.3 ACTIONS IN CASE OF EMERGENCY

In the case of a real event occurring during the exercise, the PTWC will issue the corresponding messages for the event. Such messages will be given full priority and a decision will be made by the PTWC whether to issue the CARIBE WAVE 22 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 22**” and “**Exercise**”.

#### 4.4 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 22 Task Team (Table 6).

#### 4.5 COMMUNITY REGISTRATION

For CARIBE WAVE 22, the ICG/CARIBE-EWS has continued working along 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, and others. The link for registration is the following: <http://tsunamizone.org/caribbean>. After registering, the participant will receive 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.

#### 4.6 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 Member States, the media can also provide support in building awareness leading up to the exercise and avoid false alarms. 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/en/index.php>) and the Seismic Research Centre (SRC) (<http://www.uwiseismic.com>) as additional guidance. [Annex VII](#) 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 22 through this medium. Furthermore, it is requested that the hashtag #CARIBEWAVE, be used by the participants before and during the exercise.

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Table 6. Members of the CARIBE WAVE 22 Task Team

#### 4.7 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.

### 5. POST-EXERCISE EVALUATION

Each ICG/CARIBE-EWS Member State and territory is requested to provide feedback on the exercise. This feedback will assist the evaluation of CARIBE WAVE 22 and the development of subsequent exercises. It will also help response agencies to document lessons learned and lead to improvements of the national systems. To facilitate feedback, the online evaluation survey can be accessed at the following link:

<https://www.surveymonkey.com/r/CaribeWave22>.

The deadline for completing the evaluation is **31 March 2022**.

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## ANNEX I

### 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 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 and 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 anthropogenic) 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.

Basic references providing a comprehensive summary on tsunami warning centre 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 *User's guide (for) the Pacific Tsunami Warning Center Enhanced Products for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE-EWS)* (IOC Technical Series, 135 Rev., version 2.0 October, 2017). This document is available at UNESDOC (<https://unesdoc.unesco.org/ark:/48223/pf0000259725.locale=en>) and on the website of the ITIC-CAR (<http://caribewave.info>).

## TRAINING

In order to assist countries in strengthening their warning systems, the IOC has compiled and developed a Training Manual in close partnership with ITIC. It contains 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 Manual includes session plans, lectures (in PowerPoint), exercises, and multimedia 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 of ITIC ([laura.kong@noaa.gov](mailto:laura.kong@noaa.gov)), Bernardo Aliaga, Technical Secretary, UNESCO-IOC ([b.aliaga@unesco.org](mailto:b.aliaga@unesco.org)), Christa von Hillebrandt, US NWS ITIC Caribbean Office ([christa.vonh@noaa.gov](mailto:christa.vonh@noaa.gov)), or Alison Brome, Director of CTIC ([a.brome@unesco.org](mailto:a.brome@unesco.org)). The tables presented below can be used as a guide for preparing the timeline for the exercise.



<b>Tsunami Evacuation Responsibilities Checklist for Government Disaster Response Agencies</b>		
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: <u>0000</u>	
	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 centres / 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 centres	_____	+ ____
Prepare to start electrical generators	_____	+ ____
If your facility is located in a tsunami evacuation zone: -Prepare to shut off 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	_____	+ ____

<b>Tsunami Evacuation Responsibilities Checklist for Government Disaster Response Agencies</b>		
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: <u>0000</u>	
	Agency(ies) / Department(s):	Time (mins):
Determine when to declare the “all clear”	_____	+ _____
Prepare for post tsunami impact operations	_____	+ _____
Do roll call for workers ___ and volunteers	_____	+ _____

Table I-1. Table to be used as a guide the timing, actions, authority, communication means and target audiences for a tsunami event.

ANNEX II

**MULTI-ANNUAL COMMUNITY TSUNAMI EXERCISE PROGRAMME GUIDELINES FOR  
THE TSUNAMI AND OTHER COASTAL HAZARDS WARNING SYSTEM FOR THE  
CARIBBEAN AND ADJACENT REGIONS**

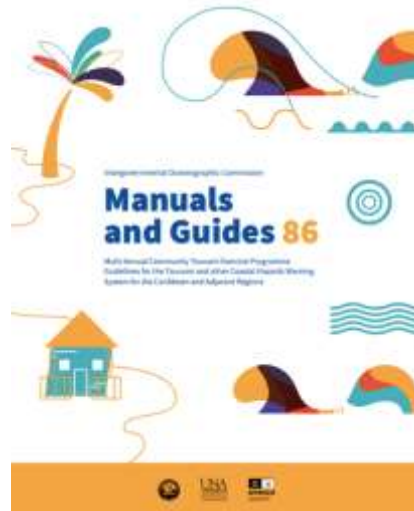


Figure II-1: Cove page of the *Manual and Guides, 86*

This guide is designed to provide community leaders with a methodology and tools, which are both easy to grasp and to use in preparing, conducting, and evaluating a multi-annual tsunami exercise program. It is particularly relevant for bodies that would be directly exposed to the effects of a tsunami (local governments, schools, associations, hotels, businesses). The guide highlights that a progressive and long-term approach is needed, which should include the development of a multi-annual programme of exercises. It is advisable to take a progressive approach to allow the guide's target audience to develop their know-how and capabilities. This can be done by progressing from a relatively simply designed exercise that is straightforward to exercises that are more complex to formulate and monitor, as well as being more logistically demanding.

This progressive approach is also crucial for selecting the type of exercise that would be best suited to achieve the established objectives, while also taking account of a community's existing level of readiness. The first phase could be a drill exercise, where a small-scale evacuation exercise is conducted. It is mainly used to train personnel, test equipment, and see if that organization has the sufficient resources and capabilities. The second phase could be a tabletop exercise. This might be most appropriate if the objective is to raise awareness among a team. For example, within a school setting, a class could discuss tsunami-related dangers and learn about the countermeasures they should take to make their classroom and class safe. The third phase could take into account lessons learned during the tabletop exercise and enable a partial tsunami evacuation exercise to be developed. It could involve the same teaching team, each of whose members could be required to know the evacuation route to a tsunami safe location. In the fourth phase, community leaders could design an exercise in which the objective would be for all or part of a community, like a school, to evacuate to a predetermined safe location in less than 15 minutes. Other more in-depth guides for exercises, especially at the national level can be found in the reference section.

This guide also aims to encourage a shared culture of exercises between, on the one hand, the municipal authorities tasked with ensuring the safety and health of those living in their area, and on the other hand, community leaders – stakeholders in the social and economic life of

the area. Planning should most importantly take into consideration new threats, such as the occurrence of a pandemic, as we see today with the outbreak of COVID-19, and adjust the exercise program accordingly to promote safety and health in the community. Integration of health conditions in the exercise can help mitigate the spread of infectious diseases and lessen the burden after a tsunami event.

The guide is divided into four sections:

- The first relates to knowledge of the tsunami as a hazard. It provides the information needed to understand the different forms that a tsunami can take, the dangers involved and safety procedures.
- The second focuses on establishing a multi-annual programme of exercises.
- The third deals with the different stages involved in preparing a tsunami evacuation exercise. It concentrates on the different functions that should be in place, the methodological approach to be followed and the practical tools that should be used.
- The fourth section covers the conduction and evaluation of a tsunami evacuation exercise.

ANNEX III

**TSUNAMI SOURCE SCENARIOS DESCRIPTION**

The following scenarios use a standard format to define the tsunami sources as described in the [Figure III-1](#) below. Each fault segment is defined by 4 corner points where point A is the lower left corner of the fault plane. Line segment A–D indicates the downdip bottom rectangular source area, whereas line B–C is the top portion of the rupture plane that is nearest to the sea-floor surface. Letters W and L represents the width and length of the plane, respectively. Letter  $W_{ap}$  represents apparent width and applies to the dimensions when observed the fault plane in map view.

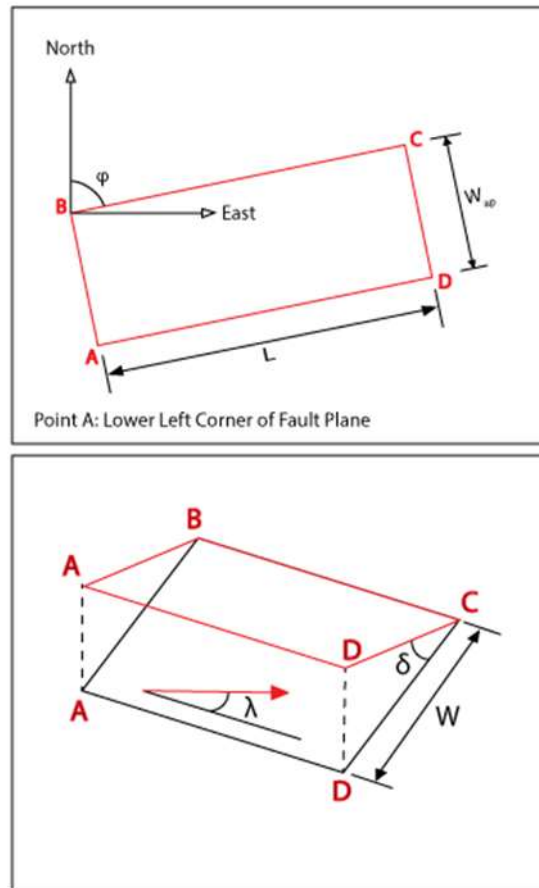


Figure III-1. Schematic of the standard used to describe all fault planes in the CARIBE WAVE Exercise scenarios.

## Western Muertos Trough Earthquake Scenario

The Western Muertos Trough earthquake scenario consists of a rupture at the western area of the trough with hypocenter at:

- Name of Scenario: CARIBE WAVE 22 Western Muertos Trough Scenario
- EQ Origin Time: 1400 UTC
- Hypocenter Latitude: 17.58°N
- Hypocenter Longitude: 69.50°W
- Hypocenter Depth (km): 2.5 km
- EQ Magnitude (Mw): 8.0
- Slip (m): 4
- Shear modulus:  $3.3 \times 10^{11}$  dyne/cm<sup>2</sup>
- Seismic Moment: 0.1148E+29 dyne-cm

Corner Point A	
Latitude	17.94°
Longitude	-70.82°
Depth (km)	4.84
Corner Point B	
Latitude	17.68°
Longitude	-70.87°
Depth (km)	0.15

Corner Point C	
Latitude	17.22°
Longitude	-68.18°
Depth (km)	0.15
Corner Point D	
Latitude	17.49°
Longitude	-68.13°
Depth (km)	4.84

Other Fault Parameters	
Strike ( $\phi$ phi)	100°
Dip ( $\delta$ delta)	9°
Rake ( $\lambda$ lambda)	90°
Length (km)	290
Width (W in km)	30
Width in Map View (m) [ $W_{ap} = W * \cos(\delta)$ ]	29.63 km

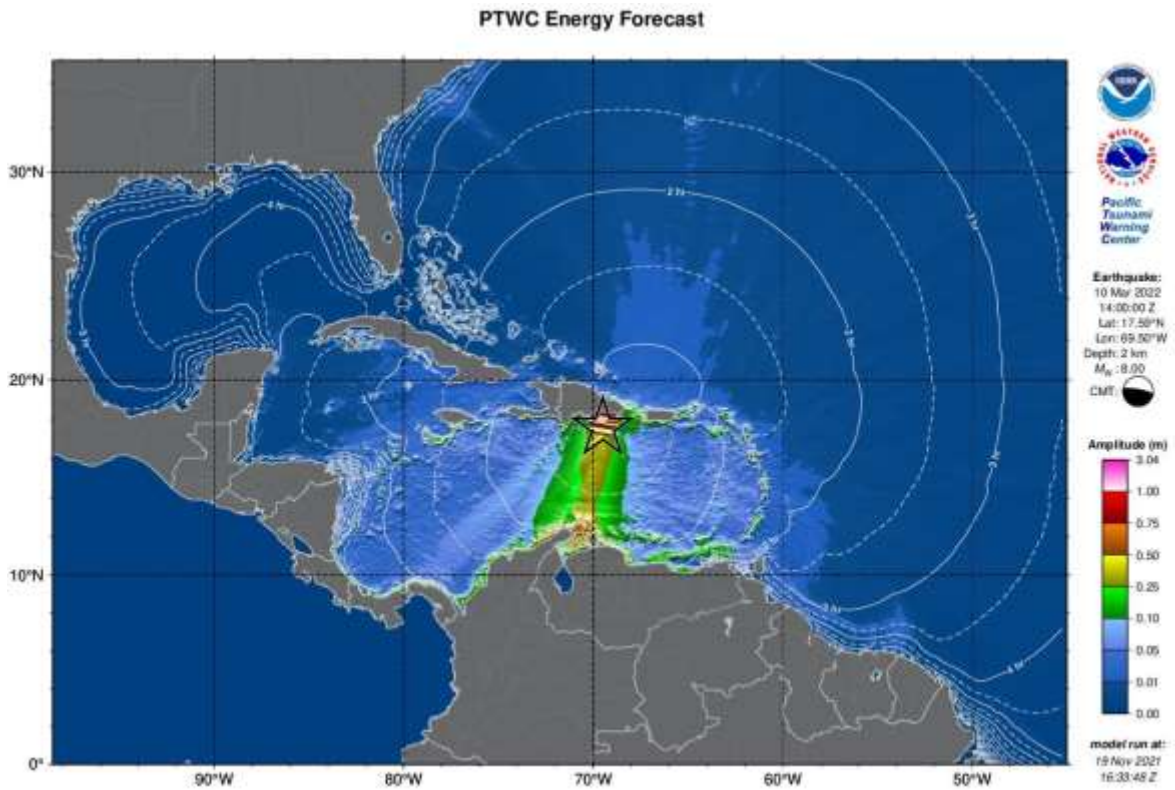


Figure III-2. RIFT maximum amplitude map for the Caribbean and Adjacent Regions for the Western Muertos Trough scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

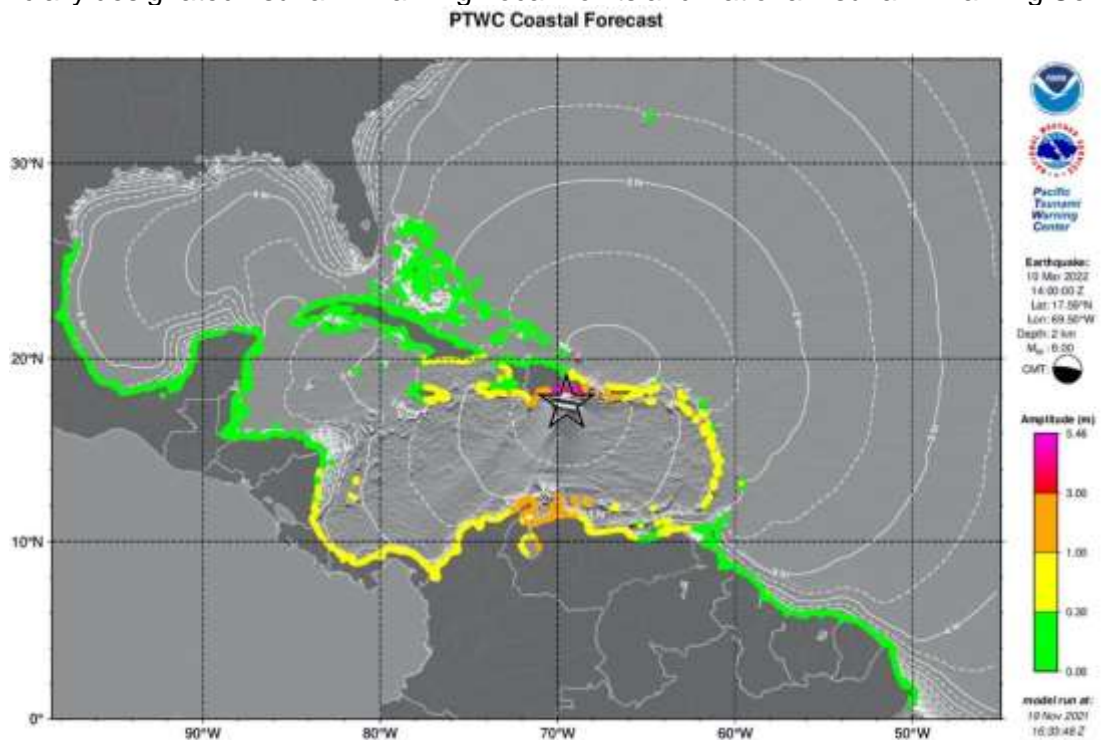


Figure III-3. RIFT coastal tsunami amplitude map for the Caribbean and Adjacent Regions for the Western Muertos Trough scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami.

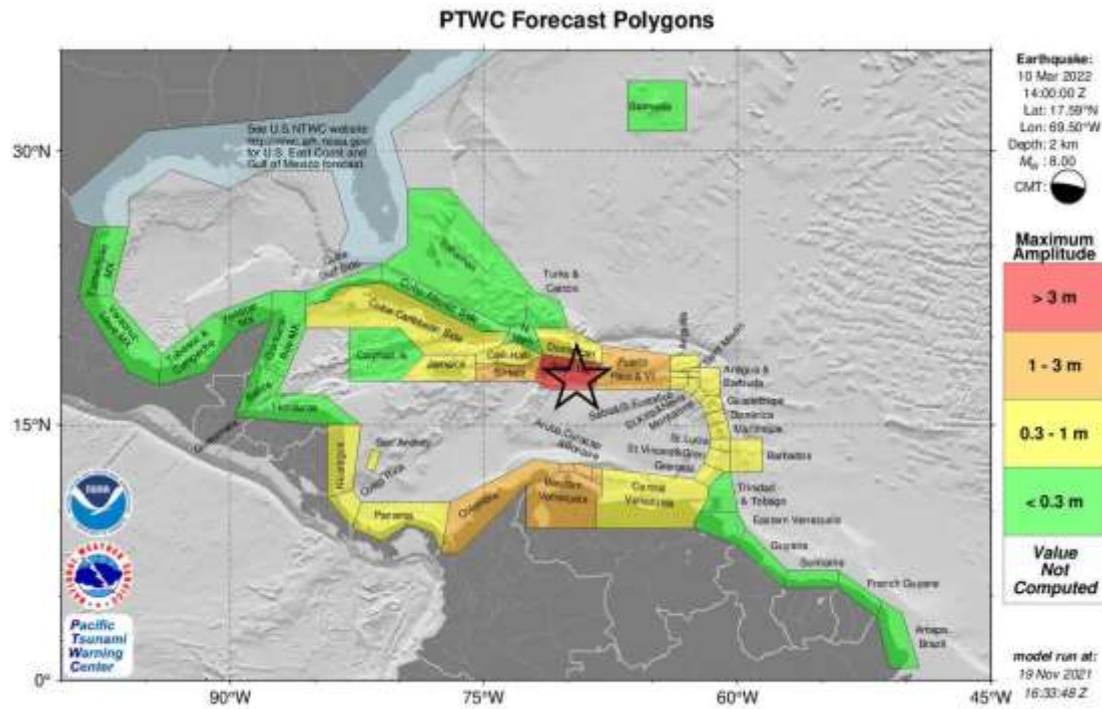


Figure III-4. RIFT forecast polygons for the Caribbean and Adjacent Regions for the Western Muertos Trough scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.



## Northern Panama Earthquake Scenario

The Panama earthquake scenario consists of rupture fault segment along the North Panama Deformed Belt with hypocenter at:

- Name of Scenario: CARIBE WAVE 22 Northern Panama Scenario
- EQ Origin Time: 1400 UTC
- Hypocenter Latitude: 9.35°N
- Hypocenter Longitude: 80.30°W
- Hypocenter Depth (km): 25
- EQ Magnitude (Mw): 8.3
- Slip (m): 8
- Shear modulus:  $3.3 \times 10^{11}$  dyne/cm<sup>2</sup>
- Seismic Moment: 0.3696E+29 dyne-cm

Corner Point A	
Latitude	8.85°
Longitude	-81.10 °
Depth (km)	42.5
Corner Point B	
Latitude	9.38°
Longitude	-81.25°
Depth (km)	7.49

Corner Point C	
Latitude	9.84°
Longitude	-79.49°
Depth (km)	7.49
Corner Point D	
Latitude	9.31°
Longitude	-79.34°
Depth (km)	42.5

Other Fault Parameters	
Strike ( $\phi$ phi)	75°
Dip ( $\delta$ delta)	30°
Rake ( $\lambda$ lambda)	90°
Length (km)	200
Width (W in km)	70
Width in Map View (km) [ $W_{ap} = W * \cos(\delta)$ ]	60.62 km

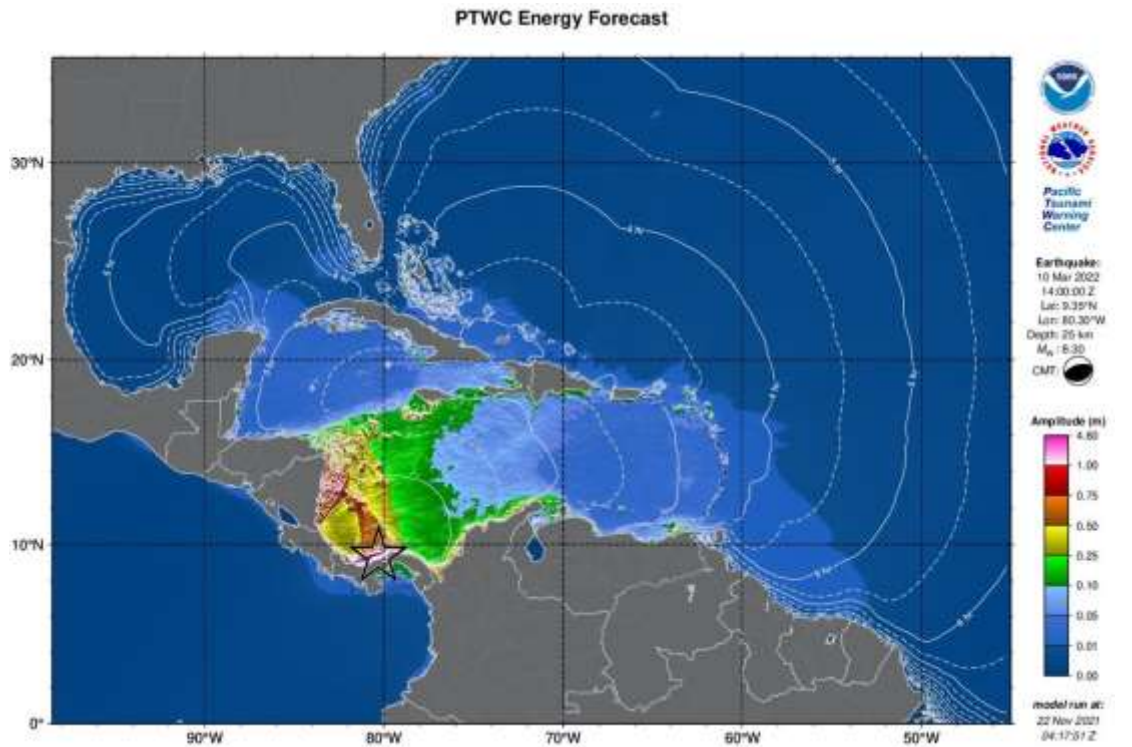


Figure III-5. RIFT maximum amplitude map for the Caribbean and Adjacent Regions for the Panama scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

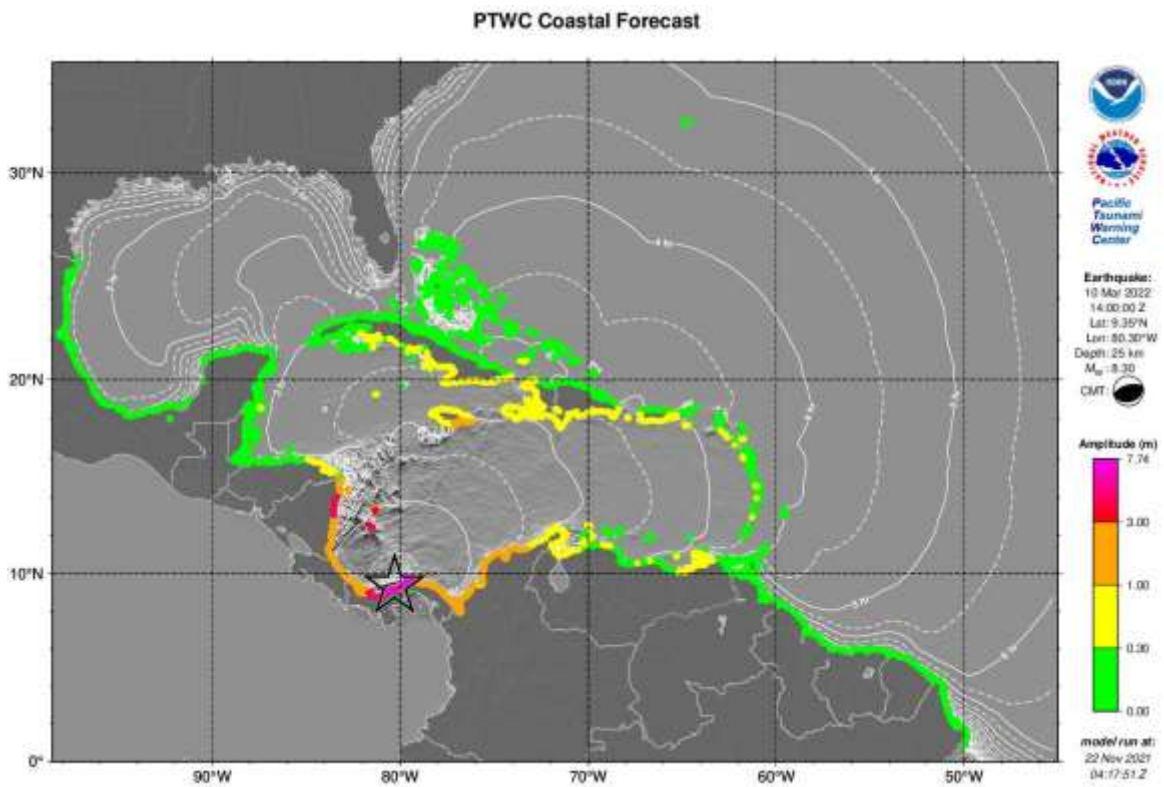


Figure III-6. RIFT coastal tsunami amplitude map for the Caribbean and Adjacent Regions for the Panama scenario. During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami.



## ANNEX IV

### EARTHQUAKE IMPACT SCENARIOS

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, the 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 include the earthquake magnitude and the four corners of the rectangles from the fault plane and the depths at each of these four vertices. ShakeMap is then used as the shaking input for PAGER loss estimates. For the case of CARIBE WAVE 22, the fault plane is represented by one segment for each of the scenarios. The Muertos Trough fault plane is 290 km long and 30 km wide, and the Panama fault plane is 200 km long and 70 km wide.

Figures IV-1 through IV-4, show ShakeMap and PAGER outputs for the CARIBE WAVE 22 earthquake scenarios.

For the Western Muertos Trough scenario, the ShakeMap shows intensities up to VII on the Mercalli Modified Scale (Figure IV-1). The strongest ground shaking is predicted near the South coast of Dominican Republic. According to the ShakeMap for the Northern Panama scenario (Figure IV-3), intensities of up to VIII on the Mercalli Modified Scale could be observed. The strongest ground shaking is predicted in Panama.

According to PAGER, (Figure IV-2 and IV-4) the CARIBE WAVE 22 simulated earthquakes would produce earthquake shaking orange alert for Western Muertos Trough scenario and red alert for the Northern Panama scenario. For the Western Muertos Trough scenario, fatalities are probable and estimated economic losses are less than 1% of the gross domestic product (GDP). As for the Panama scenario, significant casualties are likely.

Regarding population exposed to earthquake shaking, it is estimated that approximately 2.2 million people for Western Muertos Trough scenario and almost 408,000 people for the Northern Panama scenario would be exposed to Modified Mercalli intensities from VII up to VIII (according to pager).

Western Muertos Trough Earthquake Scenario

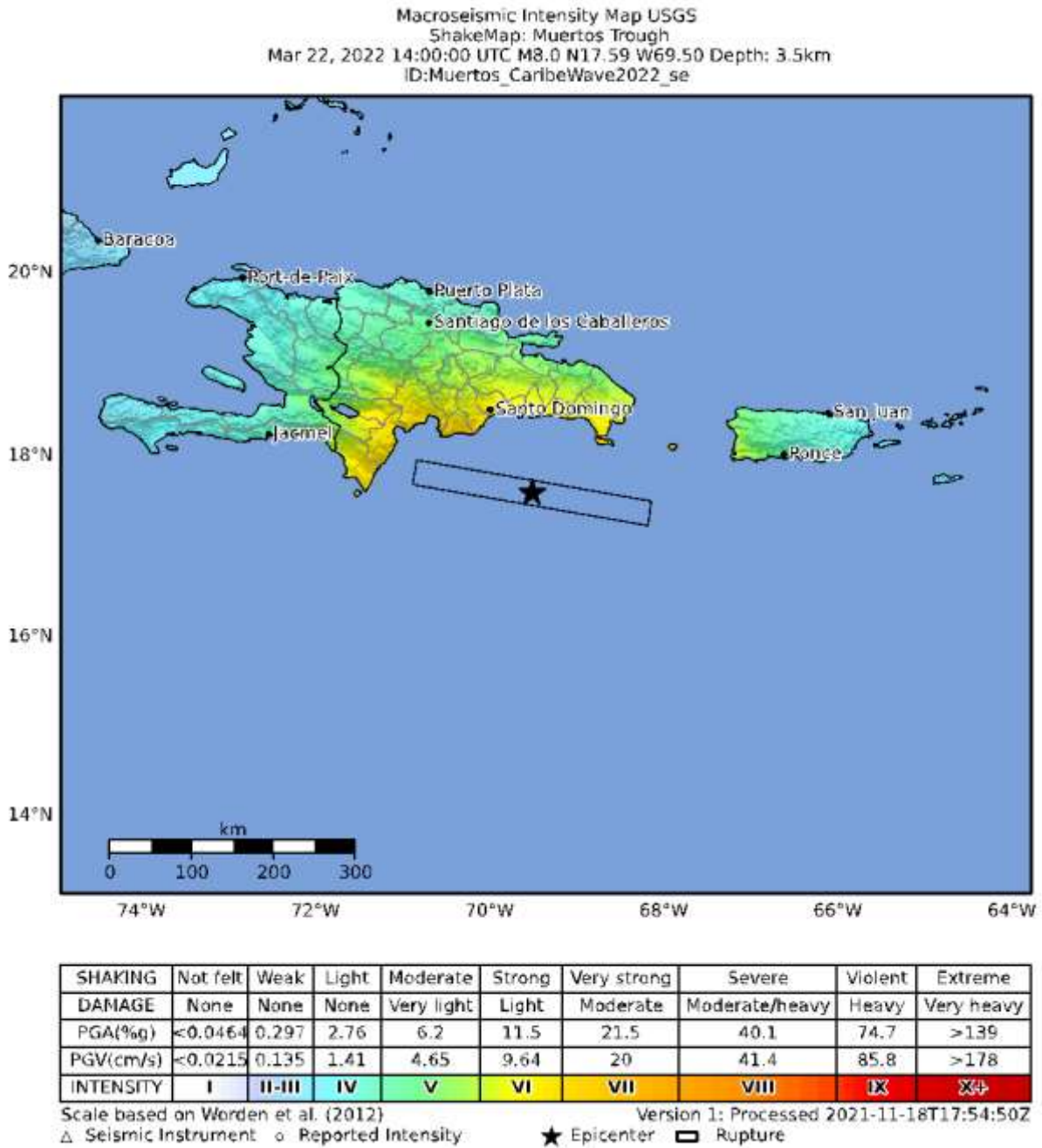


Figure IV–1. ShakeMap output for the CARIBE WAVE 22 Western Muertos Trough earthquake scenario (USGS).





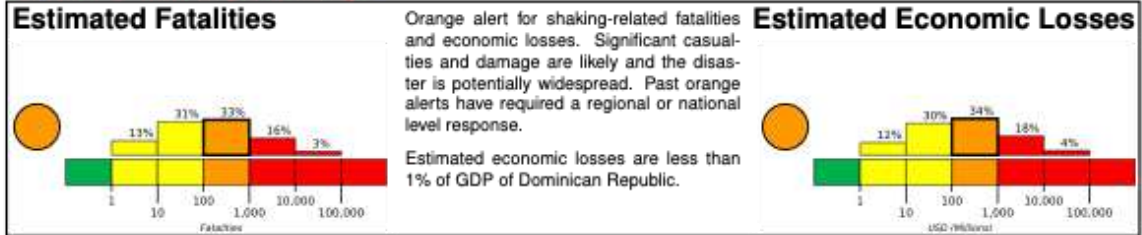
Earthquake Shaking **Orange Alert**



**PAGER**  
Version 1

**M 8.0, Scenario Muertos Trough**

Origin Time: 2022-03-22 14:00:00 UTC (Tue 09:00:00 local)  
Location: 17.5864° N 69.5040° W Depth: 3.5 km  
FOR TSUNAMI INFORMATION, SEE: [tsunami.gov](http://tsunami.gov)



**Estimated Population Exposed to Earthquake Shaking**

ESTIMATED POPULATION EXPOSURE (k=1000)	—*	333k*	10,485k	8,086k	6,375k	554k	0	0	0
ESTIMATED MODIFIED MERCALLI INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	Resistant Structures	None	None	None	V. Light	Light	Moderate	Mod./Heavy	Heavy
	Vulnerable Structures	None	None	None	Light	Moderate	Mod./Heavy	Heavy	V. Heavy

\*Estimated exposure only includes population within the map area.

**Population Exposure**



**Structures**

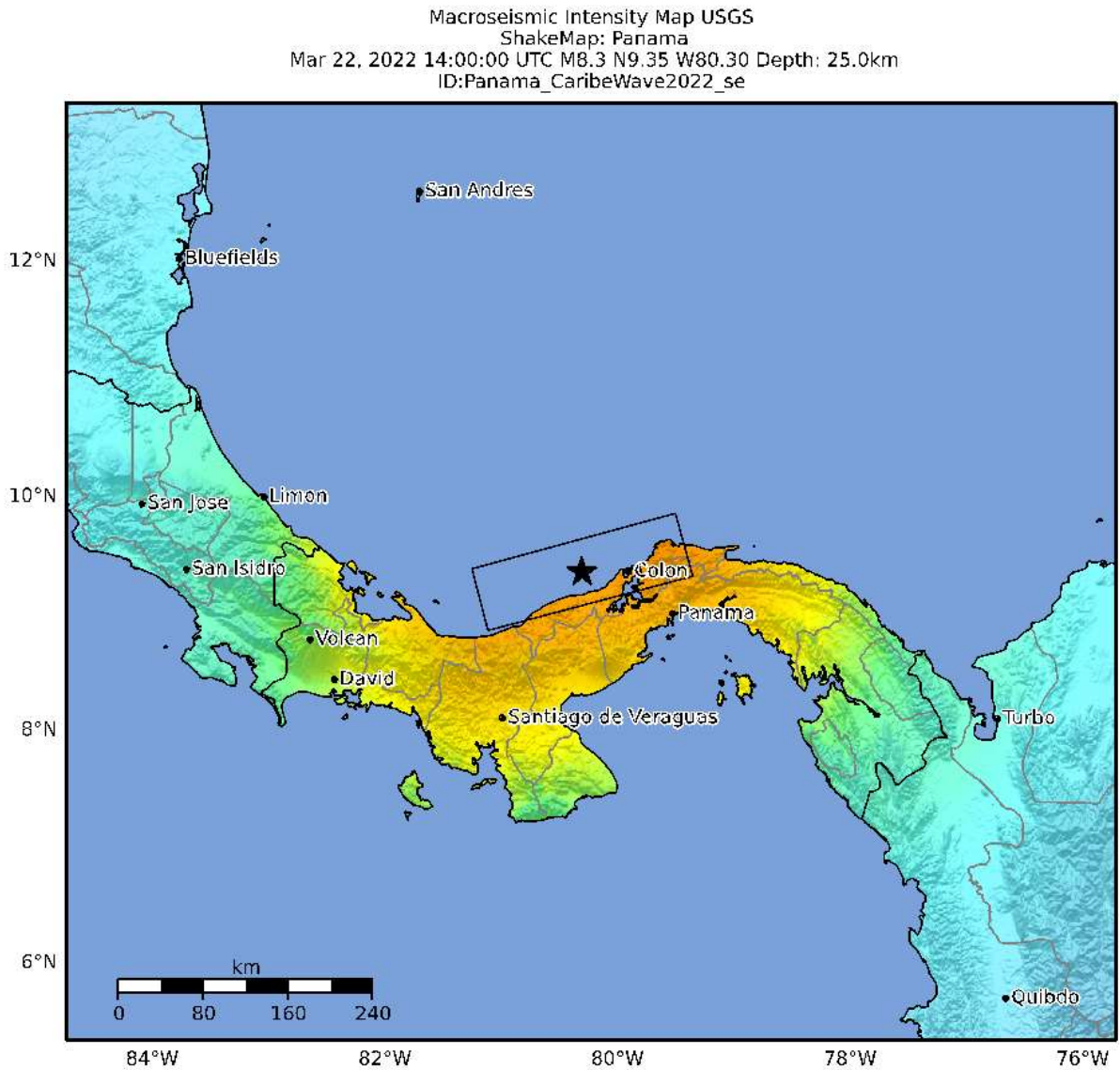
Overall, the population in this region resides in structures that are a mix of vulnerable and earthquake resistant construction. The predominant vulnerable building types are mud wall and informal (metal, timber, GI etc.) construction.

VI(605k)	IX(326k)	VII(326k)
VII Matanzas	4k	
VII Palmar de Ocoa	2k	
VII La Cienaga	3k	
VII Paya	7k	
VII Sabana Buey	2k	
VII Nizao	7k	
VI Santo Domingo	2,202k	
VI Santo Domingo Este	700k	
V Santiago de los Caballeros	1,200k	
V Port-au-Prince	1,235k	
IV San Juan	418k	

Event ID: usMuertos-StrikeWaves2022-03  
<http://earthquake.usgs.gov/monitoring/pager/>

Figure IV-2. PAGER output for CARIBE WAVE 22 Western Muertos Trough earthquake scenario (USGS).

Northern Panama Earthquake Scenario



SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	None	None	None	Very light	Light	Moderate	Moderate/heavy	Heavy	Very heavy
PGA(%g)	<0.0454	0.297	2.76	6.2	11.5	21.5	40.1	74.7	>139
PGV(cm/s)	<0.0215	0.135	1.41	4.65	9.64	20	41.4	85.8	>178
INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based on Worden et al. (2012)

Version 1: Processed 2021-11-18T17:50:40Z

△ Seismic Instrument ○ Reported Intensity

★ Epicenter □ Rupture

Figure IV-3. ShakeMap output for the CARIBE WAVE 22 Northern Panama earthquake scenario (USGS).



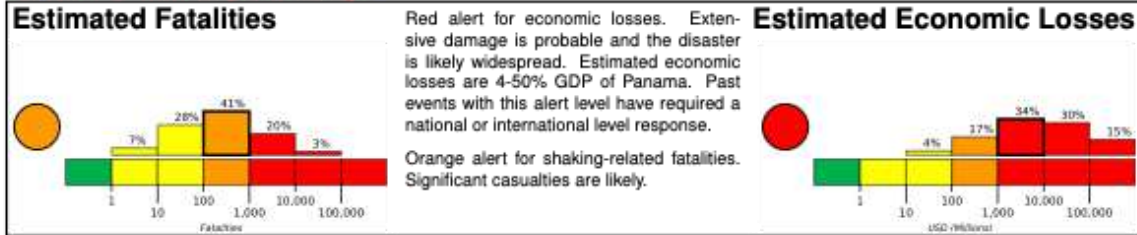
Earthquake Shaking **Red Alert**



**M 8.3, Scenario Panama**

Origin Time: 2022-03-22 14:00:00 UTC (Tue 09:00:00 local)  
Location: 9.3500° N 80.3000° W Depth: 25.0 km  
FOR TSUNAMI INFORMATION, SEE: [tsunami.gov](http://tsunami.gov)

**PAGER Version 1**

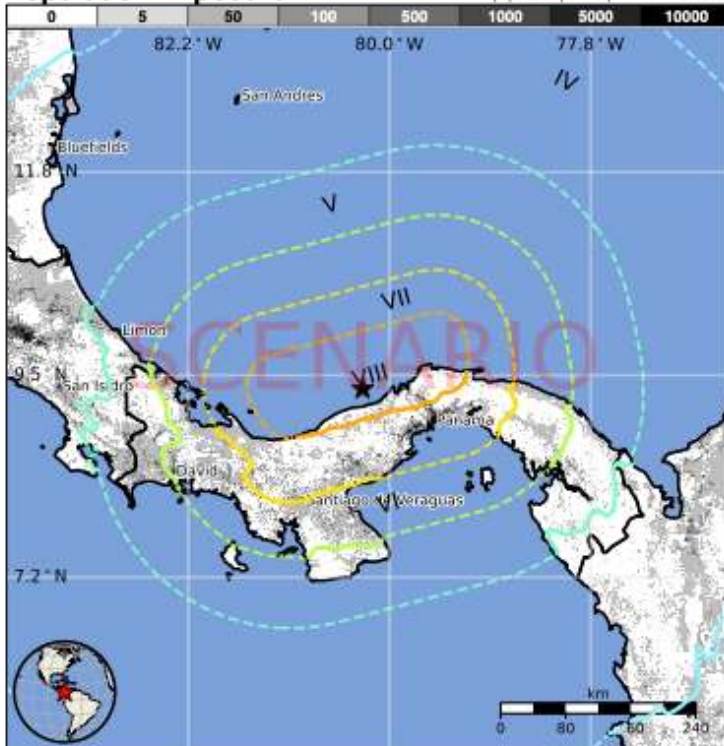


**Estimated Population Exposed to Earthquake Shaking**

ESTIMATED POPULATION EXPOSURE (k=x1000)	—*	835k*	6,565k	692k	935k	2,536k	279k	0	0	
ESTIMATED MODIFIED MERCALLI INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+	
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very Strong	Severe	Violent	Extreme	
POTENTIAL DAMAGE	Resistant Structures	None	None	None	V. Light	Light	Moderate	Mod./Heavy	Heavy	V. Heavy
	Vulnerable Structures	None	None	None	Light	Moderate	Mod./Heavy	Heavy	V. Heavy	V. Heavy

\*Estimated exposure only includes population within the map area.

**Population Exposure**



**Structures**

Overall, the population in this region resides in structures that are a mix of vulnerable and earthquake resistant construction. The predominant vulnerable building types are mud wall and adobe block construction.

**Historical Earthquakes**

Date (UTC)	Dist. (km)	Mag.	Max MMI(#)	Shaking Deaths
1982-08-19	394	6.8	V(1k)	0
1974-07-13	344	7.3	IX(2k)	11
1991-04-22	306	7.6	VII(213k)	75

Recent earthquakes in this area have caused secondary hazards such as tsunamis, landslides and liquefaction that might have contributed to losses.

**Selected City Exposure**

MMI	City	Population
VIII	Cacique	<1k
VIII	Portobelo	1k
VIII	Palenque	<1k
VIII	Viento Frio	<1k
VIII	Miramar	<1k
VIII	Nombre de Dios	<1k
VIII	Colon	77k
VII	<b>Panama</b>	<b>408k</b>
VI	David	83k
IV	San Jose	335k
IV	Monteria	272k

bold cities appear on map. (k=x1000)

PAGER content is automatically generated, and only considers losses due to structural damage. Limitations of input data, shaking estimates, and loss models may add uncertainty. <http://earthquake.usgs.gov/data/pager/>

Event ID: usPanama.CaribeWave2022.se

Figure IV–4. PAGER output for CARIBE WAVE 22 Northern Panama earthquake scenario (USGS).



ANNEX V

**PTWC DUMMY (START OF EXERCISE) MESSAGE**

**PTWC**

WECA41 PHEB 111400

TSUCAX

TEST...INITIAL DUMMY START OF EXERCISE MESSAGE...TEST

NWS PACIFIC TSUNAMI WARNING CENTER/NOAA/NWS

ISSUED AT 1400Z 11 MAR 2021

...TEST... CARIBE WAVE 21 TSUNAMI EXERCISE DUMMY MESSAGE.

REFER TO THE EXERCISE HANDBOOK. THIS IS AN EXERCISE ONLY. TEST...

THIS MESSAGE IS BEING USED TO START THE CARIBE WAVE 21

TSUNAMI EXERCISE AND TEST COMMUNICATIONS WITH UNESCO IOC CARIBE

EWS NTWCS AND TWFPS. 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](http://CARIBEWAVE.INFO). THE EXERCISE

PURPOSE IS TO EXERCISE AND EVALUATE THE CARIBE EWS TSUNAMI

WARNING SYSTEM.

\$\$

ANNEX VI

**PTWC EXERCISE MESSAGES**

**Western Muertos Trough Scenario**

The following messages created for the CARIBE WAVE 22 tsunami exercise are representative of the official standard products issued by the PTWC for a magnitude 8.0 earthquake and subsequent tsunami originating in the Western Muertos Trough. During a real event, the PTWC would also post the text products on tsunami.gov. The alerts would persist longer during a real event than is depicted in this exercise.

**PTWC Message #1**

ZCZC  
WECA41 PHEB 101407  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 1...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1407 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST

-----

\* MAGNITUDE            8.2  
\* ORIGIN TIME         1400 UTC MAR 10 2022  
\* COORDINATES        17.6 NORTH    69.5 WEST  
\* DEPTH                3 KM / 2 MILES  
\* LOCATION            DOMINICAN REPUBLIC REGION

TEST... EVALUATION ...TEST  
-----

- \* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.2 OCCURRED IN THE DOMINICAN REPUBLIC REGION AT 1400 UTC ON THURSDAY MARCH 10 2022.
- \* THIS IS A TEST MESSAGE. BASED ON THE PRELIMINARY EARTHQUAKE PARAMETERS... WIDESPREAD HAZARDOUS TSUNAMI WAVES ARE POSSIBLE.

TEST... TSUNAMI THREAT FORECAST ...TEST  
-----

- \* THIS IS A TEST MESSAGE. HAZARDOUS TSUNAMI WAVES FROM THIS EARTHQUAKE ARE POSSIBLE WITHIN THE NEXT THREE HOURS ALONG SOME COASTS OF  
  
DOMINICAN REP... HAITI... PUERTO RICO... US VIRGIN IS...  
BONAIRE... ARUBA... SABA... SAINT KITTS... SINT  
EUSTATIUS... MONTSERRAT... SINT MAARTEN... CUBA... BR  
VIRGIN IS... TURKS N CAICOS... GUADELOUPE... ANGUILLA...  
DOMINICA... CURACAO... VENEZUELA... COLOMBIA... SAINT  
LUCIA... MARTINIQUE... BAHAMAS... SAINT VINCENT... SAINT  
MARTIN... SAINT BARTHELEMY... CAYMAN ISLANDS... BARBUDA...  
JAMAICA... GRENADA... ANTIGUA... BARBADOS... PANAMA... SAN  
ANDRES PROVID... TRINIDAD TOBAGO... BERMUDA... COSTA  
RICA... MEXICO AND HONDURAS

TEST... RECOMMENDED ACTIONS ...TEST  
-----

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

\* THIS IS A TEST MESSAGE. 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)
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1415 03/10
JACAMEL	HAITI	18.1N	72.5W	1434 03/10
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1434 03/10
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1438 03/10
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1443 03/10
ONIMA	BONAIRE	12.3N	68.3W	1452 03/10
SAN JUAN	PUERTO RICO	18.5N	66.1W	1453 03/10
ORANJESTAD	ARUBA	12.5N	70.0W	1455 03/10
SABA	SABA	17.6N	63.2W	1505 03/10
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1506 03/10
JEREMIE	HAITI	18.6N	74.1W	1509 03/10
BASSETERRE	SAINT KITTS	17.3N	62.7W	1510 03/10
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1512 03/10
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1513 03/10
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1514 03/10
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1517 03/10
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1517 03/10
GRAND TURK	TURKS N CAICOS	21.5N	71.1W	1518 03/10
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1519 03/10
THE VALLEY	ANGUILLA	18.3N	63.1W	1522 03/10
CAP HAITEN	HAITI	19.8N	72.2W	1522 03/10
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1523 03/10
ROSEAU	DOMINICA	15.3N	61.4W	1523 03/10
WILLEMSTAD	CURACAO	12.1N	68.9W	1524 03/10
MAIQUETIA	VENEZUELA	10.6N	67.0W	1525 03/10
SANTA MARTA	COLOMBIA	11.2N	74.2W	1527 03/10
CASTRIES	SAINT LUCIA	14.0N	61.0W	1530 03/10
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1532 03/10
WEST CAICOS	TURKS N CAICOS	21.7N	72.5W	1532 03/10
BARACOA	CUBA	20.4N	74.5W	1532 03/10
MAYAGUANA	BAHAMAS	22.3N	73.0W	1533 03/10
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1536 03/10
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1536 03/10
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1538 03/10
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1539 03/10
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1541 03/10

CARTAGENA	COLOMBIA	10.4N	75.6W	1542	03/10
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1546	03/10
PALMETTO POINT	BARBUDA	17.6N	61.9W	1549	03/10
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1549	03/10
KINGSTON	JAMAICA	17.9N	76.9W	1550	03/10
SAINT GEORGES	GRENADA	12.0N	61.8W	1551	03/10
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1551	03/10
CUMANA	VENEZUELA	10.5N	64.2W	1552	03/10
GIBARA	CUBA	21.1N	76.1W	1552	03/10
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1552	03/10
MONTEGO BAY	JAMAICA	18.5N	77.9W	1554	03/10
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1555	03/10
RIOHACHA	COLOMBIA	11.6N	72.9W	1556	03/10
LONG ISLAND	BAHAMAS	23.3N	75.1W	1558	03/10
BRIDGETOWN	BARBADOS	13.1N	59.6W	1558	03/10
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1602	03/10
ALIGANDI	PANAMA	9.2N	78.0W	1603	03/10
EXUMA	BAHAMAS	23.6N	75.9W	1606	03/10
CAT ISLAND	BAHAMAS	24.4N	75.5W	1607	03/10
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1607	03/10
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1608	03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1609	03/10
CIENFUEGOS	CUBA	22.0N	80.5W	1609	03/10
PUERTO CARRETO	PANAMA	8.8N	77.6W	1610	03/10
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1610	03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1613	03/10
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1613	03/10
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1621	03/10
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1622	03/10
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1626	03/10
NASSAU	BAHAMAS	25.1N	77.4W	1634	03/10
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1634	03/10
ESSO PIER	BERMUDA	32.4N	64.7W	1637	03/10
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1639	03/10
COLON	PANAMA	9.4N	79.9W	1643	03/10
FREEPORT	BAHAMAS	26.5N	78.8W	1646	03/10
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1649	03/10
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1654	03/10
BIMINI	BAHAMAS	25.8N	79.3W	1659	03/10
COZUMEL	MEXICO	20.5N	87.0W	1659	03/10
PUERTO CORTES	HONDURAS	15.9N	88.0W	1703	03/10
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1705	03/10

TEST... POTENTIAL IMPACTS ...TEST

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- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

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- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).
- \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
- \* THIS IS A TEST MESSAGE. 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 [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

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

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NNNN

**PTWC Message #2**

ZCZC  
WECA41 PHEB 101430  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 2...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1430 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST  
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\* MAGNITUDE 8.0  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 17.6 NORTH 69.5 WEST  
\* DEPTH 3 KM / 2 MILES  
\* LOCATION DOMINICAN REPUBLIC REGION

TEST... EVALUATION ...TEST  
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\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.0 OCCURRED IN THE DOMINICAN REPUBLIC REGION AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST...UPDATED ...TEST  
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\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

DOMINICAN REPUBLIC.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... HAITI... VENEZUELA... ARUBA... BONAIRE...  
CURACAO... AND PUERTO RICO AND VIRGIN ISLANDS.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

COSTA RICA... CUBA... NICARAGUA... PANAMA... ANGUILLA...  
ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GRENADA...  
GUADELOUPE... JAMAICA... MARTINIQUE... MONTSERRAT... SABA  
AND SAINT EUSTATIUS... SAINT BARTHELEMY... SAINT KITTS AND  
NEVIS... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN...  
SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND  
PROVIDENCIA... AND TRINIDAD AND TOBAGO.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

- \* THIS IS A TEST MESSAGE. 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)
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1415 03/10
JACAMEL	HAITI	18.1N	72.5W	1434 03/10
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1434 03/10
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1438 03/10
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1443 03/10
ONIMA	BONAIRE	12.3N	68.3W	1452 03/10
SAN JUAN	PUERTO RICO	18.5N	66.1W	1453 03/10
ORANJESTAD	ARUBA	12.5N	70.0W	1455 03/10
SABA	SABA	17.6N	63.2W	1505 03/10
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1506 03/10
JEREMIE	HAITI	18.6N	74.1W	1509 03/10
BASSETERRE	SAINT KITTS	17.3N	62.7W	1510 03/10
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1512 03/10
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1513 03/10
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1514 03/10
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1517 03/10
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1517 03/10
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1519 03/10
THE VALLEY	ANGUILLA	18.3N	63.1W	1522 03/10
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1523 03/10
ROSEAU	DOMINICA	15.3N	61.4W	1523 03/10
WILLEMSTAD	CURACAO	12.1N	68.9W	1524 03/10
MAIQUETIA	VENEZUELA	10.6N	67.0W	1525 03/10
SANTA MARTA	COLOMBIA	11.2N	74.2W	1527 03/10
CASTRIES	SAINT LUCIA	14.0N	61.0W	1530 03/10
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1532 03/10
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1536 03/10
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1536 03/10
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1539 03/10
SAINTE BARTHELEM	SAINTE BARTHELEMY	17.9N	62.8W	1541 03/10
CARTAGENA	COLOMBIA	10.4N	75.6W	1542 03/10
PALMETTO POINT	BARBUDA	17.6N	61.9W	1549 03/10
KINGSTON	JAMAICA	17.9N	76.9W	1550 03/10
SAINTE GEORGES	GRENADA	12.0N	61.8W	1551 03/10
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1551 03/10
CUMANA	VENEZUELA	10.5N	64.2W	1552 03/10
SAINTE JOHNS	ANTIGUA	17.1N	61.9W	1552 03/10
MONTEGO BAY	JAMAICA	18.5N	77.9W	1554 03/10
BAIE BLANCHE	SAINTE MARTIN	18.1N	63.0W	1555 03/10
RIOHACHA	COLOMBIA	11.6N	72.9W	1556 03/10
BRIDGETOWN	BARBADOS	13.1N	59.6W	1558 03/10
ALIGANDI	PANAMA	9.2N	78.0W	1603 03/10
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1607 03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1609 03/10
CIENFUEGOS	CUBA	22.0N	80.5W	1609 03/10
PUERTO CARRETO	PANAMA	8.8N	77.6W	1610 03/10
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1610 03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1613 03/10
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1622 03/10
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1626 03/10
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1634 03/10
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1639 03/10
COLON	PANAMA	9.4N	79.9W	1643 03/10
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1654 03/10
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1705 03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1720 03/10

PUNTA GORDA	NICARAGUA	11.4N	83.8W	1729	03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1819	03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1833	03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	1913	03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2010	03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2057	03/10

TEST... POTENTIAL IMPACTS ...TEST

- 
- \* THIS IS A TEST MESSAGE. 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.
  - \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
  - \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
  - \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

- 
- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD
	LAT	LON	(UTC)		(MIN)
DART 42407	15.3N	68.2W	1428	0.14M/ 0.5FT	24
MONA ISLAND PR	18.1N	67.9W	1423	1.91M/ 6.3FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

- 
- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
  - \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).
  - \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

\* THIS IS A TEST MESSAGE. 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 WWW.TSUNAMI.GOV.

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

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NNNN

**PTWC Message #3**

ZCZC  
WECA41 PHEB 101500  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 3...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1500 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

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THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST

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\* MAGNITUDE           8.0  
\* ORIGIN TIME        1400 UTC MAR 10 2022  
\* COORDINATES        17.6 NORTH  69.5 WEST  
\* DEPTH              3 KM / 2 MILES  
\* LOCATION           DOMINICAN REPUBLIC REGION

TEST... EVALUATION ...TEST

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\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.0 OCCURRED IN THE DOMINICAN REPUBLIC REGION AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST ...TEST

- 
- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

DOMINICAN REPUBLIC.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... HAITI... VENEZUELA... ARUBA... BONAIRE...  
CURACAO... AND PUERTO RICO AND VIRGIN ISLANDS.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

COSTA RICA... CUBA... NICARAGUA... PANAMA... ANGUILLA...  
ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GRENADA...  
GUADELOUPE... JAMAICA... MARTINIQUE... MONTSERRAT... SABA  
AND SAINT EUSTATIUS... SAINT BARTHELEMY... SAINT KITTS AND  
NEVIS... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN...  
SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND  
PROVIDENCIA... AND TRINIDAD AND TOBAGO.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- 
- \* THIS IS A TEST MESSAGE. 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.

- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

\* THIS IS A TEST MESSAGE. 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)	
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1415	03/10
JACAMEL	HAITI	18.1N	72.5W	1434	03/10
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1434	03/10
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1438	03/10
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1443	03/10
ONIMA	BONAIRE	12.3N	68.3W	1452	03/10
SAN JUAN	PUERTO RICO	18.5N	66.1W	1453	03/10
ORANJESTAD	ARUBA	12.5N	70.0W	1455	03/10
SABA	SABA	17.6N	63.2W	1505	03/10
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1506	03/10
JEREMIE	HAITI	18.6N	74.1W	1509	03/10
BASSETERRE	SAINT KITTS	17.3N	62.7W	1510	03/10
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1512	03/10
PLYMOUTH	MONTSEERRAT	16.7N	62.2W	1513	03/10
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1514	03/10
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1517	03/10
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1517	03/10
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1519	03/10
THE VALLEY	ANGUILLA	18.3N	63.1W	1522	03/10
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1523	03/10
ROSEAU	DOMINICA	15.3N	61.4W	1523	03/10
WILLEMSTAD	CURACAO	12.1N	68.9W	1524	03/10
MAIQUETIA	VENEZUELA	10.6N	67.0W	1525	03/10
SANTA MARTA	COLOMBIA	11.2N	74.2W	1527	03/10
CASTRIES	SAINT LUCIA	14.0N	61.0W	1530	03/10
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1532	03/10
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1536	03/10
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1536	03/10
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1539	03/10
SAINT BARTHELEM	SAINT BARTHELEMY	17.9N	62.8W	1541	03/10
CARTAGENA	COLOMBIA	10.4N	75.6W	1542	03/10
PALMETTO POINT	BARBUDA	17.6N	61.9W	1549	03/10
KINGSTON	JAMAICA	17.9N	76.9W	1550	03/10
SAINT GEORGES	GRENADA	12.0N	61.8W	1551	03/10
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1551	03/10
CUMANA	VENEZUELA	10.5N	64.2W	1552	03/10
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1552	03/10
MONTEGO BAY	JAMAICA	18.5N	77.9W	1554	03/10
BAIE BLANCHE	SAINT MARTIN	18.1N	63.0W	1555	03/10
RIOHACHA	COLOMBIA	11.6N	72.9W	1556	03/10
BRIDGETOWN	BARBADOS	13.1N	59.6W	1558	03/10
ALIGANDI	PANAMA	9.2N	78.0W	1603	03/10
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1607	03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1609	03/10
CIENFUEGOS	CUBA	22.0N	80.5W	1609	03/10
PUERTO CARRETO	PANAMA	8.8N	77.6W	1610	03/10

PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1610	03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1613	03/10
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1622	03/10
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1626	03/10
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1634	03/10
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1639	03/10
COLON	PANAMA	9.4N	79.9W	1643	03/10
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1654	03/10
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1705	03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1720	03/10
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1729	03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1819	03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1833	03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	1913	03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2010	03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2057	03/10

TEST... POTENTIAL IMPACTS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
	LAT	LON			
ARECIBO PR	18.5N	66.7W	1500	0.58M/ 1.9FT	20
ESPERANZA VIEQUES P	18.1N	65.5W	1459	0.88M/ 2.9FT	22
LIMETREE VI	17.7N	64.8W	1455	0.84M/ 2.8FT	22
ST CROIX VI	17.7N	64.7W	1452	0.74M/ 2.4FT	16
YABUCA PR	18.1N	65.8W	1448	1.20M/ 3.9FT	24

MAYAGUEZ PR	18.2N	67.2W	1447	1.30M/	4.3FT	14
PUNTA CANA DO	18.5N	68.4W	1440	2.03M/	6.6FT	20
DART 42407	15.3N	68.2W	1428	0.14M/	0.5FT	24
BARAHONA DO	18.2N	71.1W	1432	3.05M/10.0FT		22
MONA ISLAND PR	18.1N	67.9W	1423	1.91M/	6.3FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

- 
- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
  - \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV.
  - \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT WWW.TSUNAMI.GOV.
  - \* THIS IS A TEST MESSAGE. 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 WWW.TSUNAMI.GOV.

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

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NNNN



**PTWC Message #4**

ZCZC  
WECA41 PHEB 101600  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 4...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1600 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST  
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\* MAGNITUDE 8.0  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 17.6 NORTH 69.5 WEST  
\* DEPTH 3 KM / 2 MILES  
\* LOCATION DOMINICAN REPUBLIC REGION

TEST... EVALUATION ...TEST  
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\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.0 OCCURRED IN THE DOMINICAN REPUBLIC REGION AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST ...TEST  
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\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

DOMINICAN REPUBLIC.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... HAITI... VENEZUELA... ARUBA... BONAIRE...  
CURACAO... AND PUERTO RICO AND VIRGIN ISLANDS.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

COSTA RICA... CUBA... NICARAGUA... PANAMA... ANGUILLA...  
ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GRENADA...  
GUADELOUPE... JAMAICA... MARTINIQUE... MONTSERRAT... SABA  
AND SAINT EUSTATIUS... SAINT BARTHELEMY... SAINT KITTS AND  
NEVIS... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN...  
SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND  
PROVIDENCIA... AND TRINIDAD AND TOBAGO.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

- \* THIS IS A TEST MESSAGE. 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)
SABA	SABA	17.6N	63.2W	1505 03/10
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1506 03/10
JEREMIE	HAITI	18.6N	74.1W	1509 03/10
BASSETERRE	SAINT KITTS	17.3N	62.7W	1510 03/10
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1512 03/10
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1513 03/10
SIMPSON BAAI	SINT MAARTEN	18.0N	63.1W	1514 03/10
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1517 03/10
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1517 03/10
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1519 03/10
THE VALLEY	ANGUILLA	18.3N	63.1W	1522 03/10
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1523 03/10
ROSEAU	DOMINICA	15.3N	61.4W	1523 03/10
WILLEMSTAD	CURACAO	12.1N	68.9W	1524 03/10
MAIQUETIA	VENEZUELA	10.6N	67.0W	1525 03/10
SANTA MARTA	COLOMBIA	11.2N	74.2W	1527 03/10
CASTRIES	SAINT LUCIA	14.0N	61.0W	1530 03/10
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1532 03/10
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1536 03/10
BAIE LUCAS	SAINT MARTIN	18.1N	63.0W	1536 03/10
BAIE GRAND CASE	SAINT MARTIN	18.1N	63.1W	1539 03/10
SAINTE BARTHELEMY	SAINTE BARTHELEMY	17.9N	62.8W	1541 03/10
CARTAGENA	COLOMBIA	10.4N	75.6W	1542 03/10
PALMETTO POINT	BARBUDA	17.6N	61.9W	1549 03/10
KINGSTON	JAMAICA	17.9N	76.9W	1550 03/10
SAINTE GEORGES	GRENADA	12.0N	61.8W	1551 03/10
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1551 03/10
CUMANA	VENEZUELA	10.5N	64.2W	1552 03/10
SAINTE JOHNS	ANTIGUA	17.1N	61.9W	1552 03/10
MONTEGO BAY	JAMAICA	18.5N	77.9W	1554 03/10
BAIE BLANCHE	SAINTE MARTIN	18.1N	63.0W	1555 03/10
RIOHACHA	COLOMBIA	11.6N	72.9W	1556 03/10
BRIDGETOWN	BARBADOS	13.1N	59.6W	1558 03/10
ALIGANDI	PANAMA	9.2N	78.0W	1603 03/10
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1607 03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1609 03/10
CIENFUEGOS	CUBA	22.0N	80.5W	1609 03/10
PUERTO CARRETO	PANAMA	8.8N	77.6W	1610 03/10
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1610 03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1613 03/10
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1622 03/10
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1626 03/10
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1634 03/10
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1639 03/10
COLON	PANAMA	9.4N	79.9W	1643 03/10
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1654 03/10
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1705 03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1720 03/10
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1729 03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1819 03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1833 03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	1913 03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2010 03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2057 03/10

TEST... POTENTIAL IMPACTS ...TEST

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- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

-----

- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
	LAT	LOX			
ISLA NAVAL CO	10.2N	75.8W	1557	0.76M/ 2.5FT	16
LE ROBERT MARTINIQU	14.7N	60.9W	1555	0.31M/ 1.0FT	22
CALLIAQUA VC	13.1N	61.2W	1549	0.93M/ 3.0FT	26
BLOWING POINT AI	18.2N	63.1W	1546	0.58M/ 1.9FT	22
PARHAM AT	17.1N	61.8W	1543	0.29M/ 1.0FT	18
DESIRADE GUADELOUPE	16.3N	61.1W	1548	0.24M/ 0.8FT	28
POINT A PITRE GP	16.2N	61.5W	1547	0.47M/ 1.5FT	24
FORT DE FRANCE MQ	14.6N	61.1W	1538	0.85M/ 2.8FT	14
SAINTE MARTIN FR	18.1N	63.1W	1543	0.55M/ 1.8FT	26
CULEBRA IS PR	18.3N	65.3W	1538	1.08M/ 3.5FT	28
SANTA MARTA CO	11.2N	74.2W	1534	1.04M/ 3.4FT	28
LE PRECHEUR MARTINI	14.8N	61.2W	1530	0.62M/ 2.0FT	22
ROSEAU DM	15.3N	61.4W	1530	0.66M/ 2.2FT	16
CHARLOTTE-AMALIE VI	18.3N	64.9W	1531	0.46M/ 1.5FT	28
CAP HAITIEN HT	19.8N	72.2W	1536	0.14M/ 0.5FT	22
PORTSMOUTH DM	15.6N	61.5W	1536	0.82M/ 2.7FT	28
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1530	0.53M/ 1.7FT	16
DESHAIES GUADELOUPE	16.3N	61.8W	1529	0.75M/ 2.5FT	18
GRAND TURK ISLAND T	21.4N	71.1W	1527	0.11M/ 0.4FT	20
BASSETERRE KN	17.3N	62.7W	1516	0.35M/ 1.1FT	24
PUERTO PLATA DO	19.8N	70.7W	1518	0.22M/ 0.7FT	26
ISABELII VIEQUES PR	18.2N	65.4W	1508	0.89M/ 2.9FT	18
BULLEN BAY CURACAO	12.2N	69.0W	1508	1.09M/ 3.6FT	26
ORANGESTAD AW	12.5N	70.0W	1501	3.57M/11.7FT	26
SAN JUAN PR	18.5N	66.1W	1507	0.70M/ 2.3FT	26

IOC Technical Series, 170 (1)  
Annex VI – page 20

ARECIBO PR	18.5N	66.7W	1500	0.58M/	1.9FT	20
ESPERANZA VIEQUES P	18.1N	65.5W	1459	0.88M/	2.9FT	22
LIMETREE VI	17.7N	64.8W	1455	0.84M/	2.8FT	22
ST CROIX VI	17.7N	64.7W	1452	0.74M/	2.4FT	16
YABUCOA PR	18.1N	65.8W	1448	1.20M/	3.9FT	24
MAYAGUEZ PR	18.2N	67.2W	1447	1.30M/	4.3FT	14
PUNTA CANA DO	18.5N	68.4W	1440	2.03M/	6.6FT	20
DART 42407	15.3N	68.2W	1428	0.14M/	0.5FT	24
BARAHONA DO	18.2N	71.1W	1432	3.05M/10.0FT		22
MONA ISLAND PR	18.1N	67.9W	1423	1.91M/	6.3FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST  
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- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).
- \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
- \* THIS IS A TEST MESSAGE. 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 [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

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

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NNNN

**PTWC Message #5**

ZCZC  
WECA41 PHEB 101700  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 5...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1700 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST  
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\* MAGNITUDE 8.0  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 17.6 NORTH 69.5 WEST  
\* DEPTH 3 KM / 2 MILES  
\* LOCATION DOMINICAN REPUBLIC REGION

TEST... EVALUATION ...TEST  
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\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.0 OCCURRED IN THE DOMINICAN REPUBLIC REGION AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST ...TEST  
-----

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

DOMINICAN REPUBLIC.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... HAITI... VENEZUELA... ARUBA... BONAIRE...  
CURACAO... AND PUERTO RICO AND VIRGIN ISLANDS.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

COSTA RICA... CUBA... NICARAGUA... PANAMA... ANGUILLA...  
ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GRENADA...  
GUADELOUPE... JAMAICA... MARTINIQUE... MONTSERRAT... SABA  
AND SAINT EUSTATIUS... SAINT BARTHELEMY... SAINT KITTS AND  
NEVIS... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN...  
SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND  
PROVIDENCIA... AND TRINIDAD AND TOBAGO.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

- \* THIS IS A TEST MESSAGE. 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	1603 03/10
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1607 03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1609 03/10
CIENFUEGOS	CUBA	22.0N	80.5W	1609 03/10
PUERTO CARRETO	PANAMA	8.8N	77.6W	1610 03/10
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1610 03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1613 03/10
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1622 03/10
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1626 03/10
PIRATES BAY	TRINIDAD TOBAGO	11.3N	60.6W	1634 03/10
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1639 03/10
COLON	PANAMA	9.4N	79.9W	1643 03/10
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1654 03/10
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1705 03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1720 03/10
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1729 03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1819 03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1833 03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	1913 03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2010 03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2057 03/10

TEST... POTENTIAL IMPACTS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD
	LAT	LON	(UTC)		(MIN)

IOC Technical Series, 170 (1)  
Annex VI – page 24

ROATAN ISLAND HN	16.3N	86.5W	1650	0.05M/	0.2FT	28
LIMON CR	10.0N	83.0W	1650	0.64M/	2.1FT	18
BERMUDA UK	32.4N	64.7W	1651	0.32M/	1.1FT	20
BERMUDA BIO STA UK	32.4N	64.7W	1651	0.21M/	0.7FT	22
SCARBOROUGH TT	11.2N	60.7W	1639	0.23M/	0.7FT	26
SAPZURRO CO	8.7N	77.4W	1631	0.55M/	1.8FT	22
EL PORVENIR PA	9.6N	78.9W	1622	1.20M/	3.9FT	24
PORT AU PRINCE HT	18.5N	72.4W	1621	0.35M/	1.1FT	28
SAN ANDRES CO	12.6N	81.7W	1625	0.40M/	1.3FT	18
TORTOLA VI UK	18.4N	64.6W	1618	1.01M/	3.3FT	14
GEORGE TOWN KY	19.3N	81.4W	1605	0.15M/	0.5FT	18
BARBUDA AG	17.6N	61.8W	1606	0.24M/	0.8FT	24
PORT ST CHARLES BB	13.3N	59.6W	1609	0.29M/	1.0FT	26
GANTERS BAY ST LUCI	14.0N	61.0W	1606	0.79M/	2.6FT	22
PRICKLEY BAY GD	12.0N	61.8W	1601	0.89M/	2.9FT	22
PORT ROYAL JM	17.9N	76.8W	1601	0.76M/	2.5FT	26
ISLA NAVAL CO	10.2N	75.8W	1557	0.76M/	2.5FT	16
LE ROBERT MARTINIQU	14.7N	60.9W	1555	0.31M/	1.0FT	22
CALLIAQUA VC	13.1N	61.2W	1549	0.93M/	3.0FT	26
BLOWING POINT AI	18.2N	63.1W	1546	0.58M/	1.9FT	22
PARHAM AT	17.1N	61.8W	1543	0.29M/	1.0FT	18
DESIRADE GUADELOUPE	16.3N	61.1W	1548	0.24M/	0.8FT	28
POINT A PITRE GP	16.2N	61.5W	1547	0.47M/	1.5FT	24
FORT DE FRANCE MQ	14.6N	61.1W	1538	0.85M/	2.8FT	14
SAINTE MARTIN FR	18.1N	63.1W	1543	0.55M/	1.8FT	26
CULEBRA IS PR	18.3N	65.3W	1538	1.08M/	3.5FT	28
SANTA MARTA CO	11.2N	74.2W	1534	1.04M/	3.4FT	28
LE PRECHEUR MARTINI	14.8N	61.2W	1530	0.62M/	2.0FT	22
ROSEAU DM	15.3N	61.4W	1530	0.66M/	2.2FT	16
CHARLOTTE-AMALIE VI	18.3N	64.9W	1531	0.46M/	1.5FT	28
CAP HAITIEN HT	19.8N	72.2W	1536	0.14M/	0.5FT	22
PORTSMOUTH DM	15.6N	61.5W	1536	0.82M/	2.7FT	28
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1530	0.53M/	1.7FT	16
DESHAIES GUADELOUPE	16.3N	61.8W	1529	0.75M/	2.5FT	18
GRAND TURK ISLAND T	21.4N	71.1W	1527	0.11M/	0.4FT	20
BASSETERRE KN	17.3N	62.7W	1516	0.35M/	1.1FT	24
PUERTO PLATA DO	19.8N	70.7W	1518	0.22M/	0.7FT	26
ISABELII VIEQUES PR	18.2N	65.4W	1508	0.89M/	2.9FT	18
BULLEN BAY CURACAO	12.2N	69.0W	1508	1.09M/	3.6FT	26
ORANGESTAD AW	12.5N	70.0W	1501	3.57M/	11.7FT	26
SAN JUAN PR	18.5N	66.1W	1507	0.70M/	2.3FT	26
ARECIBO PR	18.5N	66.7W	1500	0.58M/	1.9FT	20
ESPERANZA VIEQUES P	18.1N	65.5W	1459	0.88M/	2.9FT	22
LIMETREE VI	17.7N	64.8W	1455	0.84M/	2.8FT	22
ST CROIX VI	17.7N	64.7W	1452	0.74M/	2.4FT	16
YABUCOA PR	18.1N	65.8W	1448	1.20M/	3.9FT	24
MAYAGUEZ PR	18.2N	67.2W	1447	1.30M/	4.3FT	14
PUNTA CANA DO	18.5N	68.4W	1440	2.03M/	6.6FT	20
DART 42407	15.3N	68.2W	1428	0.14M/	0.5FT	24
BARAHONA DO	18.2N	71.1W	1432	3.05M/	10.0FT	22
MONA ISLAND PR	18.1N	67.9W	1423	1.91M/	6.3FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

-----  
\* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN  
ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

\* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV.

\* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT WWW.TSUNAMI.GOV.

\* THIS IS A TEST MESSAGE. 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 WWW.TSUNAMI.GOV.

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

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NNNN

**PTWC Message #6**

ZCZC  
WECA41 PHEB 101800  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 6...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1800 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST  
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\* MAGNITUDE           8.0  
\* ORIGIN TIME        1400 UTC MAR 10 2022  
\* COORDINATES        17.6 NORTH 69.5 WEST  
\* DEPTH               3 KM / 2 MILES  
\* LOCATION           DOMINICAN REPUBLIC REGION

TEST... EVALUATION ...TEST  
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\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.0 OCCURRED IN THE DOMINICAN REPUBLIC REGION AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST ...TEST  
-----

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

DOMINICAN REPUBLIC.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... HAITI... VENEZUELA... ARUBA... BONAIRE...  
CURACAO... AND PUERTO RICO AND VIRGIN ISLANDS.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

COSTA RICA... CUBA... NICARAGUA... PANAMA... ANGUILLA...  
ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GRENADA...  
GUADELOUPE... JAMAICA... MARTINIQUE... MONTSERRAT... SABA  
AND SAINT EUSTATIUS... SAINT BARTHELEMY... SAINT KITTS AND  
NEVIS... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN...  
SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND  
PROVIDENCIA... AND TRINIDAD AND TOBAGO.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

- \* THIS IS A TEST MESSAGE. 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)
PORT OF SPAIN	TRINIDAD TOBAGO	10.6N	61.5W	1705 03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1720 03/10
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1729 03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1819 03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1833 03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	1913 03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2010 03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	2057 03/10

TEST... POTENTIAL IMPACTS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
	LAT	LON			
CORN ISLAND NI	12.3N	83.1W	1738	0.54M/ 1.8FT	20
CEIBA CABOTAGE HN	15.8N	86.8W	1721	0.06M/ 0.2FT	20
PUERTO CORTES HN	15.8N	88.0W	1717	0.08M/ 0.2FT	20
PUERTO MORELOS MX	20.9N	86.9W	1708	0.10M/ 0.3FT	18
PUERTO MORELOS MX	20.9N	86.9W	1701	0.10M/ 0.3FT	24
PUERTO MORELOS MX	20.9N	86.9W	1702	0.10M/ 0.3FT	18
ROATAN ISLAND HN	16.3N	86.5W	1650	0.05M/ 0.2FT	28
LIMON CR	10.0N	83.0W	1650	0.64M/ 2.1FT	18
BERMUDA UK	32.4N	64.7W	1651	0.32M/ 1.1FT	20
BERMUDA BIO STA UK	32.4N	64.7W	1651	0.21M/ 0.7FT	22
SCARBOROUGH TT	11.2N	60.7W	1639	0.23M/ 0.7FT	26
SAPZURRO CO	8.7N	77.4W	1631	0.55M/ 1.8FT	22
EL PORVENIR PA	9.6N	78.9W	1622	1.20M/ 3.9FT	24



PORT AU PRINCE HT	18.5N	72.4W	1621	0.35M/	1.1FT	28
SAN ANDRES CO	12.6N	81.7W	1625	0.40M/	1.3FT	18
TORTOLA VI UK	18.4N	64.6W	1618	1.01M/	3.3FT	14
GEORGE TOWN KY	19.3N	81.4W	1605	0.15M/	0.5FT	18
BARBUDA AG	17.6N	61.8W	1606	0.24M/	0.8FT	24
PORT ST CHARLES BB	13.3N	59.6W	1609	0.29M/	1.0FT	26
GANTERS BAY ST LUCI	14.0N	61.0W	1606	0.79M/	2.6FT	22
PRICKLEY BAY GD	12.0N	61.8W	1601	0.89M/	2.9FT	22
PORT ROYAL JM	17.9N	76.8W	1601	0.76M/	2.5FT	26
ISLA NAVAL CO	10.2N	75.8W	1557	0.76M/	2.5FT	16
LE ROBERT MARTINIQU	14.7N	60.9W	1555	0.31M/	1.0FT	22
CALLIAQUA VC	13.1N	61.2W	1549	0.93M/	3.0FT	26
BLOWING POINT AI	18.2N	63.1W	1546	0.58M/	1.9FT	22
PARHAM AT	17.1N	61.8W	1543	0.29M/	1.0FT	18
DESIRADE GUADELOUPE	16.3N	61.1W	1548	0.24M/	0.8FT	28
POINT A PITRE GP	16.2N	61.5W	1547	0.47M/	1.5FT	24
FORT DE FRANCE MQ	14.6N	61.1W	1538	0.85M/	2.8FT	14
SAINTE MARTIN FR	18.1N	63.1W	1543	0.55M/	1.8FT	26
CULEBRA IS PR	18.3N	65.3W	1538	1.08M/	3.5FT	28
SANTA MARTA CO	11.2N	74.2W	1534	1.04M/	3.4FT	28
LE PRECHEUR MARTINI	14.8N	61.2W	1530	0.62M/	2.0FT	22
ROSEAU DM	15.3N	61.4W	1530	0.66M/	2.2FT	16
CHARLOTTE-AMALIE VI	18.3N	64.9W	1531	0.46M/	1.5FT	28
CAP HAITIEN HT	19.8N	72.2W	1536	0.14M/	0.5FT	22
PORTSMOUTH DM	15.6N	61.5W	1536	0.82M/	2.7FT	28
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1530	0.53M/	1.7FT	16
DESHAIES GUADELOUPE	16.3N	61.8W	1529	0.75M/	2.5FT	18
GRAND TURK ISLAND T	21.4N	71.1W	1527	0.11M/	0.4FT	20
BASSETERRE KN	17.3N	62.7W	1516	0.35M/	1.1FT	24
PUERTO PLATA DO	19.8N	70.7W	1518	0.22M/	0.7FT	26
ISABELII VIEQUES PR	18.2N	65.4W	1508	0.89M/	2.9FT	18
BULLEN BAY CURACAO	12.2N	69.0W	1508	1.09M/	3.6FT	26
ORANGESTAD AW	12.5N	70.0W	1501	3.57M/	11.7FT	26
SAN JUAN PR	18.5N	66.1W	1507	0.70M/	2.3FT	26
ARECIBO PR	18.5N	66.7W	1500	0.58M/	1.9FT	20
ESPERANZA VIEQUES P	18.1N	65.5W	1459	0.88M/	2.9FT	22
LIMETREE VI	17.7N	64.8W	1455	0.84M/	2.8FT	22
ST CROIX VI	17.7N	64.7W	1452	0.74M/	2.4FT	16
YABUCOA PR	18.1N	65.8W	1448	1.20M/	3.9FT	24
MAYAGUEZ PR	18.2N	67.2W	1447	1.30M/	4.3FT	14
PUNTA CANA DO	18.5N	68.4W	1440	2.03M/	6.6FT	20
DART 42407	15.3N	68.2W	1428	0.14M/	0.5FT	24
BARAHONA DO	18.2N	71.1W	1432	3.05M/	10.0FT	22
MONA ISLAND PR	18.1N	67.9W	1423	1.91M/	6.3FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

-----

\* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

\* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).

\* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

\* THIS IS A TEST MESSAGE. 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 WWW.TSUNAMI.GOV.

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

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NNNN

**PTWC Message #7**

ZCZC  
WECA41 PHEB 101900  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 7...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1900 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST

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\* MAGNITUDE           8.0  
\* ORIGIN TIME        1400 UTC MAR 10 2022  
\* COORDINATES        17.6 NORTH   69.5 WEST  
\* DEPTH               3 KM / 2 MILES  
\* LOCATION           DOMINICAN REPUBLIC REGION

TEST... EVALUATION ...TEST

-----  
\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.0 OCCURRED IN THE DOMINICAN REPUBLIC REGION AT 1400 UTC ON THURSDAY MARCH 10 2022.  
  
\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.  
  
\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST ...TEST

-----

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

DOMINICAN REPUBLIC.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... HAITI... VENEZUELA... ARUBA... BONAIRE...  
CURACAO... AND PUERTO RICO AND VIRGIN ISLANDS.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

COSTA RICA... CUBA... NICARAGUA... PANAMA... ANGUILLA...  
ANTIGUA AND BARBUDA... BARBADOS... DOMINICA... GRENADA...  
GUADELOUPE... JAMAICA... MARTINIQUE... MONTSERRAT... SABA  
AND SAINT EUSTATIUS... SAINT BARTHELEMY... SAINT KITTS AND  
NEVIS... SAINT LUCIA... SINT MAARTEN... SAINT MARTIN...  
SAINT VINCENT AND THE GRENADINES... SAN ANDRES AND  
PROVIDENCIA... AND TRINIDAD AND TOBAGO.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

-----

- \* THIS IS A TEST MESSAGE. 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.

- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL

AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW  
INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

-----

\* THIS IS A TEST MESSAGE. 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	1819 03/10
SANTA CRZ D SUR	CUBA	20.7N 78.0W	1833 03/10
PORLAMAR	VENEZUELA	10.9N 63.8W	1913 03/10
NUEVA GERONA	CUBA	21.9N 82.8W	2010 03/10
PUERTO CABEZAS	NICARAGUA	14.0N 83.4W	2057 03/10

TEST... POTENTIAL IMPACTS ...TEST

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\* THIS IS A TEST MESSAGE. 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.

\* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.

\* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.

\* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

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\* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT		WAVE PERIOD (MIN)
	LAT	LON				
BEAUFORT NC	34.7N	76.7W	1845	0.07M/	0.2FT	28
PORT OF BELIZE BZ	17.5N	88.2W	1827	0.05M/	0.2FT	24
CORN ISLAND NI	12.3N	83.1W	1738	0.54M/	1.8FT	20
CEIBA CABOTAGE HN	15.8N	86.8W	1721	0.06M/	0.2FT	20
PUERTO CORTES HN	15.8N	88.0W	1717	0.08M/	0.2FT	20
PUERTO MORELOS MX	20.9N	86.9W	1708	0.10M/	0.3FT	18
PUERTO MORELOS MX	20.9N	86.9W	1701	0.10M/	0.3FT	24
PUERTO MORELOS MX	20.9N	86.9W	1702	0.10M/	0.3FT	18
ROATAN ISLAND HN	16.3N	86.5W	1650	0.05M/	0.2FT	28
LIMON CR	10.0N	83.0W	1650	0.64M/	2.1FT	18
BERMUDA UK	32.4N	64.7W	1651	0.32M/	1.1FT	20
BERMUDA BIO STA UK	32.4N	64.7W	1651	0.21M/	0.7FT	22
SCARBOROUGH TT	11.2N	60.7W	1639	0.23M/	0.7FT	26
SAPZURRO CO	8.7N	77.4W	1631	0.55M/	1.8FT	22
EL PORVENIR PA	9.6N	78.9W	1622	1.20M/	3.9FT	24
PORT AU PRINCE HT	18.5N	72.4W	1621	0.35M/	1.1FT	28
SAN ANDRES CO	12.6N	81.7W	1625	0.40M/	1.3FT	18
TORTOLA VI UK	18.4N	64.6W	1618	1.01M/	3.3FT	14
GEORGE TOWN KY	19.3N	81.4W	1605	0.15M/	0.5FT	18
BARBUDA AG	17.6N	61.8W	1606	0.24M/	0.8FT	24
PORT ST CHARLES BB	13.3N	59.6W	1609	0.29M/	1.0FT	26
GANTERS BAY ST LUCI	14.0N	61.0W	1606	0.79M/	2.6FT	22
PRICKLEY BAY GD	12.0N	61.8W	1601	0.89M/	2.9FT	22
PORT ROYAL JM	17.9N	76.8W	1601	0.76M/	2.5FT	26
ISLA NAVAL CO	10.2N	75.8W	1557	0.76M/	2.5FT	16
LE ROBERT MARTINIQU	14.7N	60.9W	1555	0.31M/	1.0FT	22
CALLIAQUA VC	13.1N	61.2W	1549	0.93M/	3.0FT	26
BLOWING POINT AI	18.2N	63.1W	1546	0.58M/	1.9FT	22
PARHAM AT	17.1N	61.8W	1543	0.29M/	1.0FT	18
DESIRADE GUADELOUPE	16.3N	61.1W	1548	0.24M/	0.8FT	28
POINT A PITRE GP	16.2N	61.5W	1547	0.47M/	1.5FT	24
FORT DE FRANCE MQ	14.6N	61.1W	1538	0.85M/	2.8FT	14
SAINT MARTIN FR	18.1N	63.1W	1543	0.55M/	1.8FT	26
CULEBRA IS PR	18.3N	65.3W	1538	1.08M/	3.5FT	28
SANTA MARTA CO	11.2N	74.2W	1534	1.04M/	3.4FT	28
LE PRECHEUR MARTINI	14.8N	61.2W	1530	0.62M/	2.0FT	22
ROSEAU DM	15.3N	61.4W	1530	0.66M/	2.2FT	16
CHARLOTTE-AMALIE VI	18.3N	64.9W	1531	0.46M/	1.5FT	28
CAP HAITIEN HT	19.8N	72.2W	1536	0.14M/	0.5FT	22
PORTSMOUTH DM	15.6N	61.5W	1536	0.82M/	2.7FT	28
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1530	0.53M/	1.7FT	16
DESHAIES GUADELOUPE	16.3N	61.8W	1529	0.75M/	2.5FT	18
GRAND TURK ISLAND T	21.4N	71.1W	1527	0.11M/	0.4FT	20
BASSETERRE KN	17.3N	62.7W	1516	0.35M/	1.1FT	24
PUERTO PLATA DO	19.8N	70.7W	1518	0.22M/	0.7FT	26
ISABELII VIEQUES PR	18.2N	65.4W	1508	0.89M/	2.9FT	18

BULLEN BAY CURACAO	12.2N	69.0W	1508	1.09M/ 3.6FT	26
ORANGESTAD AW	12.5N	70.0W	1501	3.57M/11.7FT	26
SAN JUAN PR	18.5N	66.1W	1507	0.70M/ 2.3FT	26
ARECIBO PR	18.5N	66.7W	1500	0.58M/ 1.9FT	20
ESPERANZA VIEQUES P	18.1N	65.5W	1459	0.88M/ 2.9FT	22
LIMETREE VI	17.7N	64.8W	1455	0.84M/ 2.8FT	22
ST CROIX VI	17.7N	64.7W	1452	0.74M/ 2.4FT	16
YABUCOA PR	18.1N	65.8W	1448	1.20M/ 3.9FT	24
MAYAGUEZ PR	18.2N	67.2W	1447	1.30M/ 4.3FT	14
PUNTA CANA DO	18.5N	68.4W	1440	2.03M/ 6.6FT	20
DART 42407	15.3N	68.2W	1428	0.14M/ 0.5FT	24
BARAHONA DO	18.2N	71.1W	1432	3.05M/10.0FT	22
MONA ISLAND PR	18.1N	67.9W	1423	1.91M/ 6.3FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

- 
- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
  - \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).
  - \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
  - \* THIS IS A TEST MESSAGE. 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 [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

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

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NNNN



**PTWC Message #8**

ZCZC  
WECA41 PHEB 102000  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 8...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
2000 UTC THU MAR 10 2022

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...  
...TEST FINAL TSUNAMI THREAT MESSAGE TEST...

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST

-----  
\* MAGNITUDE           8.0  
\* ORIGIN TIME        1400 UTC MAR 10 2022  
\* COORDINATES        17.6 NORTH   69.5 WEST  
\* DEPTH               3 KM / 2 MILES  
\* LOCATION           DOMINICAN REPUBLIC REGION

TEST... EVALUATION ...TEST

-----  
\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.0 OCCURRED IN THE DOMINICAN REPUBLIC REGION AT 1400 UTC ON THURSDAY MARCH 10 2022.  
  
\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... THE TSUNAMI THREAT FROM THIS EARTHQUAKE HAS PASSED AND THERE IS NO FURTHER THREAT.

TEST... TSUNAMI THREAT FORECAST...UPDATED ...TEST

-----  
\* THIS IS A TEST MESSAGE. THE TSUNAMI THREAT HAS NOW LARGELY PASSED.

TEST... RECOMMENDED ACTIONS ...TEST

- 
- \* THIS IS A TEST MESSAGE. 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.
  - \* THIS IS A TEST MESSAGE. PERSONS LOCATED NEAR IMPACTED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM LOCAL AUTHORITIES.
  - \* THIS IS A TEST MESSAGE. REMAIN OBSERVANT AND EXERCISE NORMAL CAUTION NEAR THE SEA.

TEST... POTENTIAL IMPACTS ...TEST

- 
- \* THIS IS A TEST MESSAGE. 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.

TEST... TSUNAMI OBSERVATIONS ...TEST

- 
- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
	LAT	LON			
BEAUFORT NC	34.7N	76.7W	1845	0.07M/ 0.2FT	28
PORT OF BELIZE BZ	17.5N	88.2W	1827	0.05M/ 0.2FT	24
CORN ISLAND NI	12.3N	83.1W	1738	0.54M/ 1.8FT	20
CEIBA CABOTAGE HN	15.8N	86.8W	1721	0.06M/ 0.2FT	20
PUERTO CORTES HN	15.8N	88.0W	1717	0.08M/ 0.2FT	20
PUERTO MORELOS MX	20.9N	86.9W	1708	0.10M/ 0.3FT	18
PUERTO MORELOS MX	20.9N	86.9W	1701	0.10M/ 0.3FT	24

IOC Technical Series, 170 (1)  
Annex VI – page 38

PUERTO MORELOS MX	20.9N	86.9W	1702	0.10M/	0.3FT	18
ROATAN ISLAND HN	16.3N	86.5W	1650	0.05M/	0.2FT	28
LIMON CR	10.0N	83.0W	1650	0.64M/	2.1FT	18
BERMUDA UK	32.4N	64.7W	1651	0.32M/	1.1FT	20
BERMUDA BIO STA UK	32.4N	64.7W	1651	0.21M/	0.7FT	22
SCARBOROUGH TT	11.2N	60.7W	1639	0.23M/	0.7FT	26
SAPZURRO CO	8.7N	77.4W	1631	0.55M/	1.8FT	22
EL PORVENIR PA	9.6N	78.9W	1622	1.20M/	3.9FT	24
PORT AU PRINCE HT	18.5N	72.4W	1621	0.35M/	1.1FT	28
SAN ANDRES CO	12.6N	81.7W	1625	0.40M/	1.3FT	18
TORTOLA VI UK	18.4N	64.6W	1618	1.01M/	3.3FT	14
GEORGE TOWN KY	19.3N	81.4W	1605	0.15M/	0.5FT	18
BARBUDA AG	17.6N	61.8W	1606	0.24M/	0.8FT	24
PORT ST CHARLES BB	13.3N	59.6W	1609	0.29M/	1.0FT	26
GANTERS BAY ST LUCI	14.0N	61.0W	1606	0.79M/	2.6FT	22
PRICKLEY BAY GD	12.0N	61.8W	1601	0.89M/	2.9FT	22
PORT ROYAL JM	17.9N	76.8W	1601	0.76M/	2.5FT	26
ISLA NAVAL CO	10.2N	75.8W	1557	0.76M/	2.5FT	16
LE ROBERT MARTINIQU	14.7N	60.9W	1555	0.31M/	1.0FT	22
CALLIAQUA VC	13.1N	61.2W	1549	0.93M/	3.0FT	26
BLOWING POINT AI	18.2N	63.1W	1546	0.58M/	1.9FT	22
PARHAM AT	17.1N	61.8W	1543	0.29M/	1.0FT	18
DESIRADE GUADELOUPE	16.3N	61.1W	1548	0.24M/	0.8FT	28
POINT A PITRE GP	16.2N	61.5W	1547	0.47M/	1.5FT	24
FORT DE FRANCE MQ	14.6N	61.1W	1538	0.85M/	2.8FT	14
SAINT MARTIN FR	18.1N	63.1W	1543	0.55M/	1.8FT	26
CULEBRA IS PR	18.3N	65.3W	1538	1.08M/	3.5FT	28
SANTA MARTA CO	11.2N	74.2W	1534	1.04M/	3.4FT	28
LE PRECHEUR MARTINI	14.8N	61.2W	1530	0.62M/	2.0FT	22
ROSEAU DM	15.3N	61.4W	1530	0.66M/	2.2FT	16
CHARLOTTE-AMALIE VI	18.3N	64.9W	1531	0.46M/	1.5FT	28
CAP HAITIEN HT	19.8N	72.2W	1536	0.14M/	0.5FT	22
PORTSMOUTH DM	15.6N	61.5W	1536	0.82M/	2.7FT	28
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1530	0.53M/	1.7FT	16
DESHAIES GUADELOUPE	16.3N	61.8W	1529	0.75M/	2.5FT	18
GRAND TURK ISLAND T	21.4N	71.1W	1527	0.11M/	0.4FT	20
BASSETERRE KN	17.3N	62.7W	1516	0.35M/	1.1FT	24
PUERTO PLATA DO	19.8N	70.7W	1518	0.22M/	0.7FT	26
ISABELII VIEQUES PR	18.2N	65.4W	1508	0.89M/	2.9FT	18
BULLEN BAY CURACAO	12.2N	69.0W	1508	1.09M/	3.6FT	26
ORANGESTAD AW	12.5N	70.0W	1501	3.57M/	11.7FT	26
SAN JUAN PR	18.5N	66.1W	1507	0.70M/	2.3FT	26
ARECIBO PR	18.5N	66.7W	1500	0.58M/	1.9FT	20
ESPERANZA VIEQUES P	18.1N	65.5W	1459	0.88M/	2.9FT	22
LIMETREE VI	17.7N	64.8W	1455	0.84M/	2.8FT	22
ST CROIX VI	17.7N	64.7W	1452	0.74M/	2.4FT	16
YABUCOA PR	18.1N	65.8W	1448	1.20M/	3.9FT	24
MAYAGUEZ PR	18.2N	67.2W	1447	1.30M/	4.3FT	14
PUNTA CANA DO	18.5N	68.4W	1440	2.03M/	6.6FT	20
DART 42407	15.3N	68.2W	1428	0.14M/	0.5FT	24
BARAHONA DO	18.2N	71.1W	1432	3.05M/	10.0FT	22

MONA ISLAND PR            18.1N 67.9W            1423    1.91M/ 6.3FT 16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

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- \* THIS IS A TEST MESSAGE. THIS WILL BE THE FINAL STATEMENT ISSUED FOR THIS EVENT UNLESS NEW INFORMATION IS RECEIVED OR THE SITUATION CHANGES.
  
- \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).
  
- \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
  
- \* THIS IS A TEST MESSAGE. 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 [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

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

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### **Northern Panama Scenario**

The following messages created for the CARIBE WAVE 22 tsunami exercise are representative of the official standard products issued by the PTWC for a magnitude 8.3 earthquake and subsequent tsunami originating along the North Panama Deformed Belt. During a real event, the PTWC would also post the text products on [tsunami.gov](https://tsunami.gov). The alerts would persist longer during a real event than is depicted in this exercise.

**PTWC Message #1**

ZCZC  
WECA41 PHEB 101407  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 1...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1407 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST

-----  
\* MAGNITUDE 8.3  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 9.4 NORTH 80.3 WEST  
\* DEPTH 25 KM / 16 MILES  
\* LOCATION PANAMA

TEST... EVALUATION ...TEST

-----  
\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN PANAMA AT 1400 UTC ON THURSDAY MARCH 10 2022.  
  
\* THIS IS A TEST MESSAGE. BASED ON THE PRELIMINARY EARTHQUAKE PARAMETERS... WIDESPREAD HAZARDOUS TSUNAMI WAVES ARE POSSIBLE.

TEST... TSUNAMI THREAT FORECAST ...TEST

-----  
\* THIS IS A TEST MESSAGE. HAZARDOUS TSUNAMI WAVES FROM THIS EARTHQUAKE ARE POSSIBLE WITHIN THE NEXT THREE HOURS ALONG SOME COASTS OF

PANAMA... COSTA RICA... SAN ANDRES PROVID... COLOMBIA...  
NICARAGUA... HAITI... CAYMAN ISLANDS... ARUBA...  
JAMAICA... CUBA... BONAIRE... DOMINICAN REP... BAHAMAS...  
CURACAO... PUERTO RICO... TURKS N CAICOS... US VIRGIN IS  
AND VENEZUELA

TEST... RECOMMENDED ACTIONS ...TEST  
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- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST  
-----

- \* THIS IS A TEST MESSAGE. 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)
COLON	PANAMA	9.4N	79.9W	1443 03/10
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1446 03/10
ALIGANDI	PANAMA	9.2N	78.0W	1448 03/10
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1450 03/10
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1455 03/10
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1456 03/10
PUERTO CARRETO	PANAMA	8.8N	77.6W	1503 03/10
CARTAGENA	COLOMBIA	10.4N	75.6W	1509 03/10
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1517 03/10
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1526 03/10
SANTA MARTA	COLOMBIA	11.2N	74.2W	1527 03/10
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1542 03/10
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1545 03/10
JACAMEL	HAITI	18.1N	72.5W	1558 03/10
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1610 03/10
ORANJESTAD	ARUBA	12.5N	70.0W	1612 03/10
JEREMIE	HAITI	18.6N	74.1W	1614 03/10
KINGSTON	JAMAICA	17.9N	76.9W	1615 03/10
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1616 03/10
RIOHACHA	COLOMBIA	11.6N	72.9W	1617 03/10
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1618 03/10
ONIMA	BONAIRE	12.3N	68.3W	1622 03/10
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1628 03/10
MONTEGO BAY	JAMAICA	18.5N	77.9W	1634 03/10
BARACOA	CUBA	20.4N	74.5W	1637 03/10

CIENFUEGOS	CUBA	22.0N	80.5W	1638	03/10
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1643	03/10
WILLEMSTAD	CURACAO	12.1N	68.9W	1646	03/10
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1647	03/10
CAP HAITEN	HAITI	19.8N	72.2W	1649	03/10
CABO ENGANO	DOMINICAN REP	18.6N	68.3W	1653	03/10
WEST CAICOS	TURKS N CAICOS	21.7N	72.5W	1653	03/10
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1654	03/10
GIBARA	CUBA	21.1N	76.1W	1657	03/10
MAYAGUANA	BAHAMAS	22.3N	73.0W	1657	03/10
MAIQUETIA	VENEZUELA	10.6N	67.0W	1659	03/10
PUERTO PLATA	DOMINICAN REP	19.8N	70.7W	1700	03/10
SAN JUAN	PUERTO RICO	18.5N	66.1W	1706	03/10

TEST... POTENTIAL IMPACTS ...TEST

- 
- \* THIS IS A TEST MESSAGE. 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.
  - \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
  - \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
  - \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

- 
- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
  - \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).
  - \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
  - \* THIS IS A TEST MESSAGE. 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 [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

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

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NNNN



**PTWC Message #2**

ZCZC  
WECA41 PHEB 101430  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 2...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1430 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST

-----  
\* MAGNITUDE 8.3  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 9.4 NORTH 80.3 WEST  
\* DEPTH 25 KM / 16 MILES  
\* LOCATION PANAMA

TEST... EVALUATION ...TEST

-----  
\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN PANAMA AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST...UPDATED ...TEST

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\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

NICARAGUA... PANAMA... AND SAN ANDRES AND PROVIDENCIA.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... COSTA RICA... AND JAMAICA.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

CUBA... DOMINICAN REPUBLIC... HAITI... HONDURAS...  
MEXICO... VENEZUELA... ANTIGUA AND BARBUDA... ARUBA...  
BAHAMAS... BONAIRE... CAYMAN ISLANDS... CURACAO...  
GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND  
VIRGIN ISLANDS... SABA AND SAINT EUSTATIUS... SAINT KITTS  
AND NEVIS... SAINT LUCIA... AND SAINT VINCENT AND THE  
GRENADINES.

\* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

\* THIS IS A TEST MESSAGE. 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.

\* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

\* THIS IS A TEST MESSAGE. 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)
COLON	PANAMA	9.4N 79.9W	1443 03/10

IOC Technical Series, 170 (1)  
Annex VI – page 46

PUERTO LIMON	COSTA RICA	10.0N	83.0W	1446	03/10
ALIGANDI	PANAMA	9.2N	78.0W	1448	03/10
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1450	03/10
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1455	03/10
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1456	03/10
PUERTO CARRETO	PANAMA	8.8N	77.6W	1503	03/10
CARTAGENA	COLOMBIA	10.4N	75.6W	1509	03/10
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1517	03/10
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1526	03/10
SANTA MARTA	COLOMBIA	11.2N	74.2W	1527	03/10
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1542	03/10
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1545	03/10
JACAMEL	HAITI	18.1N	72.5W	1558	03/10
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1610	03/10
ORANJESTAD	ARUBA	12.5N	70.0W	1612	03/10
JEREMIE	HAITI	18.6N	74.1W	1614	03/10
KINGSTON	JAMAICA	17.9N	76.9W	1615	03/10
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1616	03/10
RIOHACHA	COLOMBIA	11.6N	72.9W	1617	03/10
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1618	03/10
ONIMA	BONAIRE	12.3N	68.3W	1622	03/10
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1628	03/10
MONTEGO BAY	JAMAICA	18.5N	77.9W	1634	03/10
BARACOA	CUBA	20.4N	74.5W	1637	03/10
CIENFUEGOS	CUBA	22.0N	80.5W	1638	03/10
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1643	03/10
WILLEMSTAD	CURACAO	12.1N	68.9W	1646	03/10
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1647	03/10
CAP HAITEN	HAITI	19.8N	72.2W	1649	03/10
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1654	03/10
GIBARA	CUBA	21.1N	76.1W	1657	03/10
MAYAGUANA	BAHAMAS	22.3N	73.0W	1657	03/10
MAIQUETIA	VENEZUELA	10.6N	67.0W	1659	03/10
SAN JUAN	PUERTO RICO	18.5N	66.1W	1706	03/10
PUERTO CORTES	HONDURAS	15.9N	88.0W	1713	03/10
COZUMEL	MEXICO	20.5N	87.0W	1713	03/10
SABA	SABA	17.6N	63.2W	1715	03/10
LONG ISLAND	BAHAMAS	23.3N	75.1W	1716	03/10
BASSETERRE	SAINT KITTS	17.3N	62.7W	1717	03/10
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1717	03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1718	03/10
PLYMOUTH	MONTSEERRAT	16.7N	62.2W	1718	03/10
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1720	03/10
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1720	03/10
CASTRIES	SAINT LUCIA	14.0N	61.0W	1724	03/10
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1725	03/10
EXUMA	BAHAMAS	23.6N	75.9W	1727	03/10
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1728	03/10
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1729	03/10
CUMANA	VENEZUELA	10.5N	64.2W	1731	03/10
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1732	03/10
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1734	03/10
CAT ISLAND	BAHAMAS	24.4N	75.5W	1735	03/10
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1744	03/10
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1752	03/10
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1757	03/10
TRUJILLO	HONDURAS	15.9N	86.0W	1759	03/10
PALMETTO POINT	BARBUDA	17.6N	61.9W	1800	03/10

NASSAU	BAHAMAS	25.1N	77.4W	1805	03/10
FREEPORT	BAHAMAS	26.5N	78.8W	1817	03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1821	03/10
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1822	03/10
BIMINI	BAHAMAS	25.8N	79.3W	1830	03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1832	03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1913	03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1931	03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	1944	03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2029	03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	2055	03/10

TEST... POTENTIAL IMPACTS ...TEST

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- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

-----

- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).
- \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
- \* THIS IS A TEST MESSAGE. 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 [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

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

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NNNN

**PTWC Message #3**

ZCZC  
WECA41 PHEB 101500  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 3...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1500 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST

-----  
\* MAGNITUDE 8.3  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 9.4 NORTH 80.3 WEST  
\* DEPTH 25 KM / 16 MILES  
\* LOCATION PANAMA

TEST... EVALUATION ...TEST

-----  
\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN PANAMA AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST...UPDATED ...TEST

-----  
\* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

- \* THIS IS A TEST MESSAGE. 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)
COLON	PANAMA	9.4N	79.9W	1443 03/10
PUERTO LIMON	COSTA RICA	10.0N	83.0W	1446 03/10
ALIGANDI	PANAMA	9.2N	78.0W	1448 03/10
PROVIDENCIA	SAN ANDRES PROVI	12.6N	81.7W	1450 03/10
SAN ANDRES	SAN ANDRES PROVI	13.4N	81.4W	1455 03/10
BOCAS DEL TORO	PANAMA	9.4N	82.2W	1456 03/10
PUERTO CARRETO	PANAMA	8.8N	77.6W	1503 03/10
CARTAGENA	COLOMBIA	10.4N	75.6W	1509 03/10
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1517 03/10
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1526 03/10
SANTA MARTA	COLOMBIA	11.2N	74.2W	1527 03/10
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1542 03/10
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1545 03/10
JACAMEL	HAITI	18.1N	72.5W	1558 03/10
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1610 03/10
ORANJESTAD	ARUBA	12.5N	70.0W	1612 03/10
JEREMIE	HAITI	18.6N	74.1W	1614 03/10
KINGSTON	JAMAICA	17.9N	76.9W	1615 03/10
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1616 03/10
RIOHACHA	COLOMBIA	11.6N	72.9W	1617 03/10
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1618 03/10
ONIMA	BONAIRE	12.3N	68.3W	1622 03/10
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1628 03/10

IOC Technical Series, 170 (1)  
Annex VI – page 50

MONTEGO BAY	JAMAICA	18.5N	77.9W	1634	03/10
BARACOA	CUBA	20.4N	74.5W	1637	03/10
CIENFUEGOS	CUBA	22.0N	80.5W	1638	03/10
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1643	03/10
WILLEMSTAD	CURACAO	12.1N	68.9W	1646	03/10
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1647	03/10
CAP HAITEN	HAITI	19.8N	72.2W	1649	03/10
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1654	03/10
GIBARA	CUBA	21.1N	76.1W	1657	03/10
MAYAGUANA	BAHAMAS	22.3N	73.0W	1657	03/10
MAIQUETIA	VENEZUELA	10.6N	67.0W	1659	03/10
SAN JUAN	PUERTO RICO	18.5N	66.1W	1706	03/10
PUERTO CORTES	HONDURAS	15.9N	88.0W	1713	03/10
COZUMEL	MEXICO	20.5N	87.0W	1713	03/10
SABA	SABA	17.6N	63.2W	1715	03/10
LONG ISLAND	BAHAMAS	23.3N	75.1W	1716	03/10
BASSETERRE	SAINT KITTS	17.3N	62.7W	1717	03/10
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1717	03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1718	03/10
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1718	03/10
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1720	03/10
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1720	03/10
CASTRIES	SAINT LUCIA	14.0N	61.0W	1724	03/10
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1725	03/10
EXUMA	BAHAMAS	23.6N	75.9W	1727	03/10
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1728	03/10
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1729	03/10
CUMANA	VENEZUELA	10.5N	64.2W	1731	03/10
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1732	03/10
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1734	03/10
CAT ISLAND	BAHAMAS	24.4N	75.5W	1735	03/10
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1744	03/10
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1752	03/10
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1757	03/10
TRUJILLO	HONDURAS	15.9N	86.0W	1759	03/10
PALMETTO POINT	BARBUDA	17.6N	61.9W	1800	03/10
NASSAU	BAHAMAS	25.1N	77.4W	1805	03/10
FREEPORT	BAHAMAS	26.5N	78.8W	1817	03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1821	03/10
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1822	03/10
BIMINI	BAHAMAS	25.8N	79.3W	1830	03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1832	03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1913	03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1931	03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	1944	03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2029	03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	2055	03/10

TEST... POTENTIAL IMPACTS ...TEST

-----

\* THIS IS A TEST MESSAGE. 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.

\* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM

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

- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD
	LAT	LOX	(UTC)		(MIN)
SAN ANDRES CO	12.6N	81.7W	1455	4.81M/15.8FT	24
LIMON CR	10.0N	83.0W	1456	3.22M/10.6FT	22
EL PORVENIR PA	9.6N	78.9W	1445	2.37M/ 7.8FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV.
- \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT WWW.TSUNAMI.GOV.
- \* THIS IS A TEST MESSAGE. 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 WWW.TSUNAMI.GOV.

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

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NNNN



**PTWC Message #4**

ZCZC  
WECA41 PHEB 101600  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 4...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1600 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST  
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\* MAGNITUDE 8.3  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 9.4 NORTH 80.3 WEST  
\* DEPTH 25 KM / 16 MILES  
\* LOCATION PANAMA

TEST... EVALUATION ...TEST  
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\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN PANAMA AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST...UPDATED ...TEST  
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\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

NICARAGUA... PANAMA... AND SAN ANDRES AND PROVIDENCIA.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... COSTA RICA... AND JAMAICA.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

CUBA... DOMINICAN REPUBLIC... HAITI... HONDURAS...  
MEXICO... VENEZUELA... ANTIGUA AND BARBUDA... ARUBA...  
BAHAMAS... BONAIRE... CAYMAN ISLANDS... CURACAO...  
GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND  
VIRGIN ISLANDS... SABA AND SAINT EUSTATIUS... SAINT KITTS  
AND NEVIS... SAINT LUCIA... AND SAINT VINCENT AND THE  
GRENADINES.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

- \* THIS IS A TEST MESSAGE. 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)
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PUERTO CARRETO	PANAMA	8.8N	77.6W	1503	03/10
CARTAGENA	COLOMBIA	10.4N	75.6W	1509	03/10
PUERTO OBALDIA	PANAMA	8.7N	77.4W	1517	03/10
PUNTA CARIBANA	COLOMBIA	8.6N	76.9W	1526	03/10
SANTA MARTA	COLOMBIA	11.2N	74.2W	1527	03/10
BARRANQUILLA	COLOMBIA	11.1N	74.9W	1542	03/10
PUNTA GORDA	NICARAGUA	11.4N	83.8W	1545	03/10
JACAMEL	HAITI	18.1N	72.5W	1558	03/10
CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1610	03/10
ORANJESTAD	ARUBA	12.5N	70.0W	1612	03/10
JEREMIE	HAITI	18.6N	74.1W	1614	03/10
KINGSTON	JAMAICA	17.9N	76.9W	1615	03/10
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1616	03/10
RIOHACHA	COLOMBIA	11.6N	72.9W	1617	03/10
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1618	03/10
ONIMA	BONAIRE	12.3N	68.3W	1622	03/10
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1628	03/10
MONTEGO BAY	JAMAICA	18.5N	77.9W	1634	03/10
BARACOA	CUBA	20.4N	74.5W	1637	03/10
CIENFUEGOS	CUBA	22.0N	80.5W	1638	03/10
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1643	03/10
WILLEMSTAD	CURACAO	12.1N	68.9W	1646	03/10
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1647	03/10
CAP HAITEN	HAITI	19.8N	72.2W	1649	03/10
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1654	03/10
GIBARA	CUBA	21.1N	76.1W	1657	03/10
MAYAGUANA	BAHAMAS	22.3N	73.0W	1657	03/10
MAIQUETIA	VENEZUELA	10.6N	67.0W	1659	03/10
SAN JUAN	PUERTO RICO	18.5N	66.1W	1706	03/10
PUERTO CORTES	HONDURAS	15.9N	88.0W	1713	03/10
COZUMEL	MEXICO	20.5N	87.0W	1713	03/10
SABA	SABA	17.6N	63.2W	1715	03/10
LONG ISLAND	BAHAMAS	23.3N	75.1W	1716	03/10
BASSETERRE	SAINT KITTS	17.3N	62.7W	1717	03/10
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1717	03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1718	03/10
PLYMOUTH	MONTSEERRAT	16.7N	62.2W	1718	03/10
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1720	03/10
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1720	03/10
CASTRIES	SAINT LUCIA	14.0N	61.0W	1724	03/10
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1725	03/10
EXUMA	BAHAMAS	23.6N	75.9W	1727	03/10
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1728	03/10
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1729	03/10
CUMANA	VENEZUELA	10.5N	64.2W	1731	03/10
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1732	03/10
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1734	03/10
CAT ISLAND	BAHAMAS	24.4N	75.5W	1735	03/10
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1744	03/10
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1752	03/10
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1757	03/10
TRUJILLO	HONDURAS	15.9N	86.0W	1759	03/10
PALMETTO POINT	BARBUDA	17.6N	61.9W	1800	03/10
NASSAU	BAHAMAS	25.1N	77.4W	1805	03/10
FREEPORT	BAHAMAS	26.5N	78.8W	1817	03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1821	03/10
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1822	03/10

BIMINI	BAHAMAS	25.8N	79.3W	1830	03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1832	03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1913	03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1931	03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	1944	03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2029	03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	2055	03/10

TEST... POTENTIAL IMPACTS ...TEST

- 
- \* THIS IS A TEST MESSAGE. 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.
  - \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
  - \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
  - \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

- 
- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
	LAT	LON			
SANTA MARTA CO	11.2N	74.2W	1536	2.01M/ 6.6FT	16
SAPZURRO CO	8.7N	77.4W	1527	1.78M/ 5.8FT	24
ISLA NAVAL CO	10.2N	75.8W	1524	1.48M/ 4.8FT	14
BOCAS DEL TORO PA	9.4N	82.3W	1510	3.88M/12.7FT	20
SAN ANDRES CO	12.6N	81.7W	1455	4.81M/15.8FT	24
LIMON CR	10.0N	83.0W	1456	3.22M/10.6FT	22
EL PORVENIR PA	9.6N	78.9W	1445	2.37M/ 7.8FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

- 
- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
  - \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE

EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON  
THE INTERNET AT EARTHQUAKE.USGS.GOV.

\* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT  
MAY BE FOUND AT WWW.TSUNAMI.GOV.

\* THIS IS A TEST MESSAGE. 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 WWW.TSUNAMI.GOV.

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

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NNNN

**PTWC Message #5**

ZCZC  
WECA41 PHEB 101700  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 5...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1700 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST  
-----

\* MAGNITUDE 8.3  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 9.4 NORTH 80.3 WEST  
\* DEPTH 25 KM / 16 MILES  
\* LOCATION PANAMA

TEST... EVALUATION ...TEST  
-----

\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN PANAMA AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST ...TEST  
-----

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

NICARAGUA... PANAMA... AND SAN ANDRES AND PROVIDENCIA.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... COSTA RICA... AND JAMAICA.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

CUBA... DOMINICAN REPUBLIC... HAITI... HONDURAS...  
MEXICO... VENEZUELA... ANTIGUA AND BARBUDA... ARUBA...  
BAHAMAS... BONAIRE... CAYMAN ISLANDS... CURACAO...  
GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND  
VIRGIN ISLANDS... SABA AND SAINT EUSTATIUS... SAINT KITTS  
AND NEVIS... SAINT LUCIA... AND SAINT VINCENT AND THE  
GRENADINES.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

- \* THIS IS A TEST MESSAGE. 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)
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CAYMAN BRAC	CAYMAN ISLANDS	19.7N	79.9W	1610	03/10
ORANJESTAD	ARUBA	12.5N	70.0W	1612	03/10
JEREMIE	HAITI	18.6N	74.1W	1614	03/10
KINGSTON	JAMAICA	17.9N	76.9W	1615	03/10
SANTIAGO D CUBA	CUBA	19.9N	75.8W	1616	03/10
RIOHACHA	COLOMBIA	11.6N	72.9W	1617	03/10
GRAND CAYMAN	CAYMAN ISLANDS	19.3N	81.3W	1618	03/10
ONIMA	BONAIRE	12.3N	68.3W	1622	03/10
SANTO DOMINGO	DOMINICAN REP	18.5N	69.9W	1628	03/10
MONTEGO BAY	JAMAICA	18.5N	77.9W	1634	03/10
BARACOA	CUBA	20.4N	74.5W	1637	03/10
CIENFUEGOS	CUBA	22.0N	80.5W	1638	03/10
GREAT INAGUA	BAHAMAS	20.9N	73.7W	1643	03/10
WILLEMSTAD	CURACAO	12.1N	68.9W	1646	03/10
MAYAGUEZ	PUERTO RICO	18.2N	67.2W	1647	03/10
CAP HAITEN	HAITI	19.8N	72.2W	1649	03/10
CHRISTIANSTED	US VIRGIN IS	17.7N	64.7W	1654	03/10
GIBARA	CUBA	21.1N	76.1W	1657	03/10
MAYAGUANA	BAHAMAS	22.3N	73.0W	1657	03/10
MAIQUETIA	VENEZUELA	10.6N	67.0W	1659	03/10
SAN JUAN	PUERTO RICO	18.5N	66.1W	1706	03/10
PUERTO CORTES	HONDURAS	15.9N	88.0W	1713	03/10
COZUMEL	MEXICO	20.5N	87.0W	1713	03/10
SABA	SABA	17.6N	63.2W	1715	03/10
LONG ISLAND	BAHAMAS	23.3N	75.1W	1716	03/10
BASSETERRE	SAINT KITTS	17.3N	62.7W	1717	03/10
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1717	03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1718	03/10
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1718	03/10
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1720	03/10
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1720	03/10
CASTRIES	SAINT LUCIA	14.0N	61.0W	1724	03/10
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1725	03/10
EXUMA	BAHAMAS	23.6N	75.9W	1727	03/10
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1728	03/10
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1729	03/10
CUMANA	VENEZUELA	10.5N	64.2W	1731	03/10
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1732	03/10
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1734	03/10
CAT ISLAND	BAHAMAS	24.4N	75.5W	1735	03/10
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1744	03/10
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1752	03/10
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1757	03/10
TRUJILLO	HONDURAS	15.9N	86.0W	1759	03/10
PALMETTO POINT	BARBUDA	17.6N	61.9W	1800	03/10
NASSAU	BAHAMAS	25.1N	77.4W	1805	03/10
FREEPORT	BAHAMAS	26.5N	78.8W	1817	03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1821	03/10
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1822	03/10
BIMINI	BAHAMAS	25.8N	79.3W	1830	03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1832	03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1913	03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1931	03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	1944	03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2029	03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	2055	03/10



TEST... POTENTIAL IMPACTS ...TEST

-----

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

-----

- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
	LAT	LOX			
LIMETREE VI	17.7N	64.8W	1700	0.60M/ 2.0FT	22
ROATAN ISLAND HN	16.3N	86.5W	1658	0.28M/ 0.9FT	28
CAP HAITIEN HT	19.8N	72.2W	1657	0.22M/ 0.7FT	16
MAYAGUEZ PR	18.2N	67.2W	1657	0.53M/ 1.8FT	18
PUERTO EL BLUFF NI	12.0N	83.7W	1649	3.37M/11.1FT	20
PUNTA CANA DO	18.5N	68.4W	1646	0.62M/ 2.0FT	24
MONA ISLAND PR	18.1N	67.9W	1644	0.50M/ 1.6FT	26
BARAHONA DO	18.2N	71.1W	1628	0.68M/ 2.2FT	18
BULLEN BAY CURACAO	12.2N	69.0W	1631	0.39M/ 1.3FT	26
GEORGE TOWN KY	19.3N	81.4W	1621	0.40M/ 1.3FT	26
PORT ROYAL JM	17.9N	76.8W	1629	1.84M/ 6.0FT	26
DART 42407	15.3N	68.2W	1626	0.05M/ 0.2FT	20
ORANGESTAD AW	12.5N	70.0W	1625	0.54M/ 1.8FT	22
CORN ISLAND NI	12.3N	83.1W	1602	3.83M/12.6FT	22
SANTA MARTA CO	11.2N	74.2W	1536	2.01M/ 6.6FT	16
SAPZURRO CO	8.7N	77.4W	1527	1.78M/ 5.8FT	24
ISLA NAVAL CO	10.2N	75.8W	1524	1.48M/ 4.8FT	14
BOCAS DEL TORO PA	9.4N	82.3W	1510	3.88M/12.7FT	20
SAN ANDRES CO	12.6N	81.7W	1455	4.81M/15.8FT	24
LIMON CR	10.0N	83.0W	1456	3.22M/10.6FT	22
EL PORVENIR PA	9.6N	78.9W	1445	2.37M/ 7.8FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

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\* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN  
ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.

\* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE  
EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON  
THE INTERNET AT EARTHQUAKE.USGS.GOV.

\* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT  
MAY BE FOUND AT WWW.TSUNAMI.GOV.

\* THIS IS A TEST MESSAGE. 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 WWW.TSUNAMI.GOV.

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

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NNNN

**PTWC Message #6**

ZCZC  
WECA41 PHEB 101800  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 6...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1800 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST  
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\* MAGNITUDE 8.3  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 9.4 NORTH 80.3 WEST  
\* DEPTH 25 KM / 16 MILES  
\* LOCATION PANAMA

TEST... EVALUATION ...TEST  
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\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN PANAMA AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST ...TEST  
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\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

NICARAGUA... PANAMA... AND SAN ANDRES AND PROVIDENCIA.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... COSTA RICA... AND JAMAICA.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

CUBA... DOMINICAN REPUBLIC... HAITI... HONDURAS...  
MEXICO... VENEZUELA... ANTIGUA AND BARBUDA... ARUBA...  
BAHAMAS... BONAIRE... CAYMAN ISLANDS... CURACAO...  
GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND  
VIRGIN ISLANDS... SABA AND SAINT EUSTATIUS... SAINT KITTS  
AND NEVIS... SAINT LUCIA... AND SAINT VINCENT AND THE  
GRENADINES.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

- \* THIS IS A TEST MESSAGE. 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)
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SAN JUAN	PUERTO RICO	18.5N	66.1W	1706	03/10
PUERTO CORTES	HONDURAS	15.9N	88.0W	1713	03/10
COZUMEL	MEXICO	20.5N	87.0W	1713	03/10
SABA	SABA	17.6N	63.2W	1715	03/10
LONG ISLAND	BAHAMAS	23.3N	75.1W	1716	03/10
BASSETERRE	SAINT KITTS	17.3N	62.7W	1717	03/10
SAN SALVADOR	BAHAMAS	24.1N	74.5W	1717	03/10
PORT AU PRINCE	HAITI	18.5N	72.4W	1718	03/10
PLYMOUTH	MONTSERRAT	16.7N	62.2W	1718	03/10
SINT EUSTATIUS	SINT EUSTATIUS	17.5N	63.0W	1720	03/10
BASSE TERRE	GUADELOUPE	16.0N	61.7W	1720	03/10
CASTRIES	SAINT LUCIA	14.0N	61.0W	1724	03/10
KINGSTOWN	SAINT VINCENT	13.1N	61.2W	1725	03/10
EXUMA	BAHAMAS	23.6N	75.9W	1727	03/10
FORT DE FRANCE	MARTINIQUE	14.6N	61.1W	1728	03/10
ANEGADA	BR VIRGIN IS	18.8N	64.3W	1729	03/10
CUMANA	VENEZUELA	10.5N	64.2W	1731	03/10
CROOKED ISLAND	BAHAMAS	22.7N	74.1W	1732	03/10
CHARLOTTE AMALI	US VIRGIN IS	18.3N	64.9W	1734	03/10
CAT ISLAND	BAHAMAS	24.4N	75.5W	1735	03/10
ELEUTHERA ISLAN	BAHAMAS	25.2N	76.1W	1744	03/10
ANDROS ISLAND	BAHAMAS	25.0N	77.9W	1752	03/10
SAINT JOHNS	ANTIGUA	17.1N	61.9W	1757	03/10
TRUJILLO	HONDURAS	15.9N	86.0W	1759	03/10
PALMETTO POINT	BARBUDA	17.6N	61.9W	1800	03/10
NASSAU	BAHAMAS	25.1N	77.4W	1805	03/10
FREEPORT	BAHAMAS	26.5N	78.8W	1817	03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1821	03/10
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1822	03/10
BIMINI	BAHAMAS	25.8N	79.3W	1830	03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1832	03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1913	03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1931	03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	1944	03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2029	03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	2055	03/10

TEST... POTENTIAL IMPACTS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

\* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT		WAVE PERIOD (MIN)
	LAT	LOX				
BLOWING POINT AI	18.2N	63.1W	1755	0.37M/	1.2FT	18
LE ROBERT MARTINIQU	14.7N	60.9W	1758	0.14M/	0.5FT	18
ISLA MUJERES MX	21.3N	86.7W	1748	0.38M/	1.2FT	24
SAINT MARTIN FR	18.1N	63.1W	1748	0.31M/	1.0FT	18
CULEBRA IS PR	18.3N	65.3W	1750	0.44M/	1.4FT	28
DESIRADE GUADELOUPE	16.3N	61.1W	1751	0.13M/	0.4FT	18
PRICKLEY BAY GD	12.0N	61.8W	1750	0.39M/	1.3FT	20
POINT A PITRE GP	16.2N	61.5W	1749	0.28M/	0.9FT	22
CHARLOTTE-AMALIE VI	18.3N	64.9W	1745	0.36M/	1.2FT	26
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1742	0.35M/	1.2FT	22
CALLIAQUA VC	13.1N	61.2W	1736	0.37M/	1.2FT	24
FORT DE FRANCE MQ	14.6N	61.1W	1737	0.40M/	1.3FT	28
CEIBA CABOTAGE HN	15.8N	86.8W	1739	0.23M/	0.8FT	18
ROSEAU DM	15.3N	61.4W	1731	0.37M/	1.2FT	14
LE PRECHEUR MARTINI	14.8N	61.2W	1728	0.34M/	1.1FT	18
PORTSMOUTH DM	15.6N	61.5W	1728	0.39M/	1.3FT	24
DESHAIES GUADELOUPE	16.3N	61.8W	1732	0.38M/	1.2FT	26
PORT AU PRINCE HT	18.5N	72.4W	1730	1.02M/	3.3FT	22
BASSETERRE KN	17.3N	62.7W	1727	0.36M/	1.2FT	22
CARRIE BOW CAY BZ	16.8N	88.1W	1724	0.25M/	0.8FT	26
PUERTO CORTES HN	15.8N	88.0W	1721	0.29M/	1.0FT	16
ISABELII VIEQUES PR	18.2N	65.4W	1720	0.38M/	1.2FT	22
SIAN KAN MX	19.3N	87.4W	1720	0.28M/	0.9FT	26
PUERTO MORELOS MX	20.9N	86.9W	1719	0.31M/	1.0FT	22
PUERTO MORELOS MX	20.9N	86.9W	1716	0.31M/	1.0FT	18
PUERTO MORELOS MX	20.9N	86.9W	1721	0.31M/	1.0FT	28
SAN JUAN PR	18.5N	66.1W	1720	0.14M/	0.5FT	24
ARECIBO PR	18.5N	66.7W	1715	0.15M/	0.5FT	26
PUERTO PLATA DO	19.8N	70.7W	1709	0.11M/	0.4FT	28
ESPERANZA VIEQUES P	18.1N	65.5W	1705	0.58M/	1.9FT	28
LIMETREE VI	17.7N	64.8W	1700	0.60M/	2.0FT	22
ST CROIX VI	17.7N	64.7W	1702	0.42M/	1.4FT	16
ROATAN ISLAND HN	16.3N	86.5W	1658	0.28M/	0.9FT	28
YABUCOA PR	18.1N	65.8W	1703	0.57M/	1.9FT	22
MAGUEYES ISLAND PR	18.0N	67.0W	1703	0.60M/	2.0FT	28
CAP HAITIEN HT	19.8N	72.2W	1657	0.22M/	0.7FT	16
MAYAGUEZ PR	18.2N	67.2W	1657	0.53M/	1.8FT	18
PUERTO EL BLUFF NI	12.0N	83.7W	1649	3.37M/	11.1FT	20
PUNTA CANA DO	18.5N	68.4W	1646	0.62M/	2.0FT	24
MONA ISLAND PR	18.1N	67.9W	1644	0.50M/	1.6FT	26
BARAHONA DO	18.2N	71.1W	1628	0.68M/	2.2FT	18
BULLEN BAY CURACAO	12.2N	69.0W	1631	0.39M/	1.3FT	26
GEORGE TOWN KY	19.3N	81.4W	1621	0.40M/	1.3FT	26
PORT ROYAL JM	17.9N	76.8W	1629	1.84M/	6.0FT	26

IOC Technical Series, 170 (1)  
Annex VI – page 66

DART 42407	15.3N	68.2W	1626	0.05M/ 0.2FT	20
ORANGESTAD AW	12.5N	70.0W	1625	0.54M/ 1.8FT	22
CORN ISLAND NI	12.3N	83.1W	1602	3.83M/12.6FT	22
SANTA MARTA CO	11.2N	74.2W	1536	2.01M/ 6.6FT	16
SAPZURRO CO	8.7N	77.4W	1527	1.78M/ 5.8FT	24
ISLA NAVAL CO	10.2N	75.8W	1524	1.48M/ 4.8FT	14
BOCAS DEL TORO PA	9.4N	82.3W	1510	3.88M/12.7FT	20
SAN ANDRES CO	12.6N	81.7W	1455	4.81M/15.8FT	24
LIMON CR	10.0N	83.0W	1456	3.22M/10.6FT	22
EL PORVENIR PA	9.6N	78.9W	1445	2.37M/ 7.8FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST  
-----

- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).
- \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
- \* THIS IS A TEST MESSAGE. 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 [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

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

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NNNN

**PTWC Message #7**

ZCZC  
WECA41 PHEB 101900  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 7...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
1900 UTC THU MAR 10 2022

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

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST  
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\* MAGNITUDE 8.3  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 9.4 NORTH 80.3 WEST  
\* DEPTH 25 KM / 16 MILES  
\* LOCATION PANAMA

TEST... EVALUATION ...TEST  
-----

\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN PANAMA AT 1400 UTC ON THURSDAY MARCH 10 2022.

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES HAVE BEEN OBSERVED.

\* THIS IS A TEST MESSAGE. BASED ON ALL AVAILABLE DATA... HAZARDOUS TSUNAMI WAVES ARE FORECAST FOR SOME COASTS.

TEST... TSUNAMI THREAT FORECAST ...TEST  
-----

\* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING MORE THAN 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF



NICARAGUA... PANAMA... AND SAN ANDRES AND PROVIDENCIA.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 1 TO 3 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE ALONG SOME COASTS OF

COLOMBIA... COSTA RICA... AND JAMAICA.

- \* THIS IS A TEST MESSAGE. TSUNAMI WAVES REACHING 0.3 TO 1 METERS ABOVE THE TIDE LEVEL ARE POSSIBLE FOR SOME COASTS OF

CUBA... DOMINICAN REPUBLIC... HAITI... HONDURAS...  
MEXICO... VENEZUELA... ANTIGUA AND BARBUDA... ARUBA...  
BAHAMAS... BONAIRE... CAYMAN ISLANDS... CURACAO...  
GUADELOUPE... MARTINIQUE... MONTSERRAT... PUERTO RICO AND  
VIRGIN ISLANDS... SABA AND SAINT EUSTATIUS... SAINT KITTS  
AND NEVIS... SAINT LUCIA... AND SAINT VINCENT AND THE  
GRENADINES.

- \* THIS IS A TEST MESSAGE. 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.

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

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED IN THREATENED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM NATIONAL AND LOCAL AUTHORITIES.

TEST... ESTIMATED TIMES OF ARRIVAL ...TEST

- \* THIS IS A TEST MESSAGE. 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)
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PALMETTO POINT	BARBUDA	17.6N	61.9W	1800	03/10
NASSAU	BAHAMAS	25.1N	77.4W	1805	03/10
FREEPORT	BAHAMAS	26.5N	78.8W	1817	03/10
ROADTOWN	BR VIRGIN IS	18.4N	64.6W	1821	03/10
ABACO ISLAND	BAHAMAS	26.6N	77.1W	1822	03/10
BIMINI	BAHAMAS	25.8N	79.3W	1830	03/10
PUNTO FIJO	VENEZUELA	11.7N	70.2W	1832	03/10
SANTA CRZ D SUR	CUBA	20.7N	78.0W	1913	03/10
GOLFO VENEZUELA	VENEZUELA	11.4N	71.2W	1931	03/10
PUERTO CABEZAS	NICARAGUA	14.0N	83.4W	1944	03/10
NUEVA GERONA	CUBA	21.9N	82.8W	2029	03/10
PORLAMAR	VENEZUELA	10.9N	63.8W	2055	03/10

TEST... POTENTIAL IMPACTS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* THIS IS A TEST MESSAGE. IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* THIS IS A TEST MESSAGE. PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TEST... TSUNAMI OBSERVATIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
	LAT	LON			
PORT OF SPAIN TT	10.6N	61.5W	1859	0.18M/ 0.6FT	28
BERMUDA UK	32.4N	64.7W	1858	0.06M/ 0.2FT	22
PORT OF BELIZE BZ	17.5N	88.2W	1837	0.32M/ 1.0FT	24
TORTOLA VI UK	18.4N	64.6W	1829	0.41M/ 1.4FT	20
SCARBOROUGH TT	11.2N	60.7W	1821	0.16M/ 0.5FT	26
BARBUDA AG	17.6N	61.8W	1816	0.13M/ 0.4FT	20
PORT ST CHARLES BB	13.3N	59.6W	1804	0.13M/ 0.4FT	16
GANTERS BAY ST LUCI	14.0N	61.0W	1802	0.34M/ 1.1FT	20
PARHAM AT	17.1N	61.8W	1801	0.18M/ 0.6FT	20
BLOWING POINT AI	18.2N	63.1W	1755	0.37M/ 1.2FT	18

IOC Technical Series, 170 (1)  
Annex VI – page 70

LE ROBERT MARTINIQU	14.7N	60.9W	1758	0.14M/	0.5FT	18
ISLA MUJERES MX	21.3N	86.7W	1748	0.38M/	1.2FT	24
SAINT MARTIN FR	18.1N	63.1W	1748	0.31M/	1.0FT	18
CULEBRA IS PR	18.3N	65.3W	1750	0.44M/	1.4FT	28
DESIRADE GUADELOUPE	16.3N	61.1W	1751	0.13M/	0.4FT	18
PRICKLEY BAY GD	12.0N	61.8W	1750	0.39M/	1.3FT	20
POINT A PITRE GP	16.2N	61.5W	1749	0.28M/	0.9FT	22
CHARLOTTE-AMALIE VI	18.3N	64.9W	1745	0.36M/	1.2FT	26
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1742	0.35M/	1.2FT	22
CALLIAQUA VC	13.1N	61.2W	1736	0.37M/	1.2FT	24
FORT DE FRANCE MQ	14.6N	61.1W	1737	0.40M/	1.3FT	28
CEIBA CABOTAGE HN	15.8N	86.8W	1739	0.23M/	0.8FT	18
ROSEAU DM	15.3N	61.4W	1731	0.37M/	1.2FT	14
LE PRECHEUR MARTINI	14.8N	61.2W	1728	0.34M/	1.1FT	18
PORTSMOUTH DM	15.6N	61.5W	1728	0.39M/	1.3FT	24
DESHAIES GUADELOUPE	16.3N	61.8W	1732	0.38M/	1.2FT	26
PORT AU PRINCE HT	18.5N	72.4W	1730	1.02M/	3.3FT	22
BASSETERRE KN	17.3N	62.7W	1727	0.36M/	1.2FT	22
CARRIE BOW CAY BZ	16.8N	88.1W	1724	0.25M/	0.8FT	26
PUERTO CORTES HN	15.8N	88.0W	1721	0.29M/	1.0FT	16
ISABELII VIEQUES PR	18.2N	65.4W	1720	0.38M/	1.2FT	22
SIAN KAN MX	19.3N	87.4W	1720	0.28M/	0.9FT	26
PUERTO MORELOS MX	20.9N	86.9W	1719	0.31M/	1.0FT	22
PUERTO MORELOS MX	20.9N	86.9W	1716	0.31M/	1.0FT	18
PUERTO MORELOS MX	20.9N	86.9W	1721	0.31M/	1.0FT	28
SAN JUAN PR	18.5N	66.1W	1720	0.14M/	0.5FT	24
ARECIBO PR	18.5N	66.7W	1715	0.15M/	0.5FT	26
PUERTO PLATA DO	19.8N	70.7W	1709	0.11M/	0.4FT	28
ESPERANZA VIEQUES P	18.1N	65.5W	1705	0.58M/	1.9FT	28
LIMETREE VI	17.7N	64.8W	1700	0.60M/	2.0FT	22
ST CROIX VI	17.7N	64.7W	1702	0.42M/	1.4FT	16
ROATAN ISLAND HN	16.3N	86.5W	1658	0.28M/	0.9FT	28
YABUCOA PR	18.1N	65.8W	1703	0.57M/	1.9FT	22
MAGUEYES ISLAND PR	18.0N	67.0W	1703	0.60M/	2.0FT	28
CAP HAITIEN HT	19.8N	72.2W	1657	0.22M/	0.7FT	16
MAYAGUEZ PR	18.2N	67.2W	1657	0.53M/	1.8FT	18
PUERTO EL BLUFF NI	12.0N	83.7W	1649	3.37M/11.1FT	20	
PUNTA CANA DO	18.5N	68.4W	1646	0.62M/	2.0FT	24
MONA ISLAND PR	18.1N	67.9W	1644	0.50M/	1.6FT	26
BARAHONA DO	18.2N	71.1W	1628	0.68M/	2.2FT	18
BULLEN BAY CURACAO	12.2N	69.0W	1631	0.39M/	1.3FT	26
GEORGE TOWN KY	19.3N	81.4W	1621	0.40M/	1.3FT	26
PORT ROYAL JM	17.9N	76.8W	1629	1.84M/	6.0FT	26
DART 42407	15.3N	68.2W	1626	0.05M/	0.2FT	20
ORANGESTAD AW	12.5N	70.0W	1625	0.54M/	1.8FT	22
CORN ISLAND NI	12.3N	83.1W	1602	3.83M/12.6FT	22	
SANTA MARTA CO	11.2N	74.2W	1536	2.01M/	6.6FT	16
SAPZURRO CO	8.7N	77.4W	1527	1.78M/	5.8FT	24
ISLA NAVAL CO	10.2N	75.8W	1524	1.48M/	4.8FT	14
BOCAS DEL TORO PA	9.4N	82.3W	1510	3.88M/12.7FT	20	
SAN ANDRES CO	12.6N	81.7W	1455	4.81M/15.8FT	24	
LIMON CR	10.0N	83.0W	1456	3.22M/10.6FT	22	
EL PORVENIR PA	9.6N	78.9W	1445	2.37M/	7.8FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

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- \* THIS IS A TEST MESSAGE. THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT EARTHQUAKE.USGS.GOV.
- \* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT WWW.TSUNAMI.GOV.
- \* THIS IS A TEST MESSAGE. 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 WWW.TSUNAMI.GOV.

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

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NNNN

**PTWC Message #8**

ZCZC  
WECA41 PHEB 102000  
TSUCAX

TEST...TSUNAMI MESSAGE NUMBER 8...TEST  
NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI  
2000 UTC THU MAR 10 2022

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...  
...TEST FINAL TSUNAMI THREAT MESSAGE TEST...

\*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\* NOTICE \*\*\*\*

THIS IS A TEST MESSAGE. 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.

THIS IS A TEST MESSAGE. 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 \*\*\*\*

TEST... PRELIMINARY EARTHQUAKE PARAMETERS ...TEST

-----  
\* MAGNITUDE 8.3  
\* ORIGIN TIME 1400 UTC MAR 10 2022  
\* COORDINATES 9.4 NORTH 80.3 WEST  
\* DEPTH 25 KM / 16 MILES  
\* LOCATION PANAMA

TEST... EVALUATION ...TEST

-----  
\* THIS IS A TEST MESSAGE. AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN PANAMA AT 1400 UTC ON THURSDAY MARCH 10 2022.

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

TEST... TSUNAMI THREAT FORECAST...UPDATED ...TEST

-----  
\* THIS IS A TEST MESSAGE. THE TSUNAMI THREAT HAS NOW LARGELY PASSED.

TEST... RECOMMENDED ACTIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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.
- \* THIS IS A TEST MESSAGE. PERSONS LOCATED NEAR IMPACTED COASTAL AREAS SHOULD STAY ALERT FOR INFORMATION AND FOLLOW INSTRUCTIONS FROM LOCAL AUTHORITIES.
- \* THIS IS A TEST MESSAGE. REMAIN OBSERVANT AND EXERCISE NORMAL CAUTION NEAR THE SEA.

TEST... POTENTIAL IMPACTS ...TEST

- \* THIS IS A TEST MESSAGE. MINOR SEA LEVEL FLUCTUATIONS OF UP TO 1 FOOT ABOVE AND BELOW THE NORMAL TIDE MAY CONTINUE OVER THE NEXT FEW HOURS.

TEST... TSUNAMI OBSERVATIONS ...TEST

- \* THIS IS A TEST MESSAGE. 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		TIME OF MEASURE (UTC)	MAXIMUM TSUNAMI HEIGHT	WAVE PERIOD (MIN)
	LAT	LON			
PUERTO BILWI NI	14.0N	83.4W	1958	6.17M/20.2FT	18
PORT OF SPAIN TT	10.6N	61.5W	1859	0.18M/ 0.6FT	28
BERMUDA UK	32.4N	64.7W	1858	0.06M/ 0.2FT	22
PORT OF BELIZE BZ	17.5N	88.2W	1837	0.32M/ 1.0FT	24
TORTOLA VI UK	18.4N	64.6W	1829	0.41M/ 1.4FT	20
SCARBOROUGH TT	11.2N	60.7W	1821	0.16M/ 0.5FT	26
BARBUDA AG	17.6N	61.8W	1816	0.13M/ 0.4FT	20
PORT ST CHARLES BB	13.3N	59.6W	1804	0.13M/ 0.4FT	16
GANTERS BAY ST LUCI	14.0N	61.0W	1802	0.34M/ 1.1FT	20
PARHAM AT	17.1N	61.8W	1801	0.18M/ 0.6FT	20
BLOWING POINT AI	18.2N	63.1W	1755	0.37M/ 1.2FT	18
LE ROBERT MARTINIQU	14.7N	60.9W	1758	0.14M/ 0.5FT	18
ISLA MUJERES MX	21.3N	86.7W	1748	0.38M/ 1.2FT	24
SAINT MARTIN FR	18.1N	63.1W	1748	0.31M/ 1.0FT	18
CULEBRA IS PR	18.3N	65.3W	1750	0.44M/ 1.4FT	28
DESIRADE GUADELOUPE	16.3N	61.1W	1751	0.13M/ 0.4FT	18
PRICKLEY BAY GD	12.0N	61.8W	1750	0.39M/ 1.3FT	20
POINT A PITRE GP	16.2N	61.5W	1749	0.28M/ 0.9FT	22
CHARLOTTE-AMALIE VI	18.3N	64.9W	1745	0.36M/ 1.2FT	26
LAMESHURBAYSTJOHNVI	18.3N	64.7W	1742	0.35M/ 1.2FT	22
CALLIAQUA VC	13.1N	61.2W	1736	0.37M/ 1.2FT	24
FORT DE FRANCE MQ	14.6N	61.1W	1737	0.40M/ 1.3FT	28

IOC Technical Series, 170 (1)  
Annex VI – page 74

CEIBA CABOTAGE HN	15.8N	86.8W	1739	0.23M/	0.8FT	18
ROSEAU DM	15.3N	61.4W	1731	0.37M/	1.2FT	14
LE PRECHEUR MARTINI	14.8N	61.2W	1728	0.34M/	1.1FT	18
PORTSMOUTH DM	15.6N	61.5W	1728	0.39M/	1.3FT	24
DESHAIES GUADELOUPE	16.3N	61.8W	1732	0.38M/	1.2FT	26
PORT AU PRINCE HT	18.5N	72.4W	1730	1.02M/	3.3FT	22
BASSETERRE KN	17.3N	62.7W	1727	0.36M/	1.2FT	22
CARRIE BOW CAY BZ	16.8N	88.1W	1724	0.25M/	0.8FT	26
PUERTO CORTES HN	15.8N	88.0W	1721	0.29M/	1.0FT	16
ISABELII VIEQUES PR	18.2N	65.4W	1720	0.38M/	1.2FT	22
SIAN KAN MX	19.3N	87.4W	1720	0.28M/	0.9FT	26
PUERTO MORELOS MX	20.9N	86.9W	1719	0.31M/	1.0FT	22
PUERTO MORELOS MX	20.9N	86.9W	1716	0.31M/	1.0FT	18
PUERTO MORELOS MX	20.9N	86.9W	1721	0.31M/	1.0FT	28
SAN JUAN PR	18.5N	66.1W	1720	0.14M/	0.5FT	24
ARECIBO PR	18.5N	66.7W	1715	0.15M/	0.5FT	26
PUERTO PLATA DO	19.8N	70.7W	1709	0.11M/	0.4FT	28
ESPERANZA VIEQUES P	18.1N	65.5W	1705	0.58M/	1.9FT	28
LIMETREE VI	17.7N	64.8W	1700	0.60M/	2.0FT	22
ST CROIX VI	17.7N	64.7W	1702	0.42M/	1.4FT	16
ROATAN ISLAND HN	16.3N	86.5W	1658	0.28M/	0.9FT	28
YABUCOA PR	18.1N	65.8W	1703	0.57M/	1.9FT	22
MAGUEYES ISLAND PR	18.0N	67.0W	1703	0.60M/	2.0FT	28
CAP HAITIEN HT	19.8N	72.2W	1657	0.22M/	0.7FT	16
MAYAGUEZ PR	18.2N	67.2W	1657	0.53M/	1.8FT	18
PUERTO EL BLUFF NI	12.0N	83.7W	1649	3.37M/11.1FT	20	
PUNTA CANA DO	18.5N	68.4W	1646	0.62M/	2.0FT	24
MONA ISLAND PR	18.1N	67.9W	1644	0.50M/	1.6FT	26
BARAHONA DO	18.2N	71.1W	1628	0.68M/	2.2FT	18
BULLEN BAY CURACAO	12.2N	69.0W	1631	0.39M/	1.3FT	26
GEORGE TOWN KY	19.3N	81.4W	1621	0.40M/	1.3FT	26
PORT ROYAL JM	17.9N	76.8W	1629	1.84M/	6.0FT	26
DART 42407	15.3N	68.2W	1626	0.05M/	0.2FT	20
ORANGESTAD AW	12.5N	70.0W	1625	0.54M/	1.8FT	22
CORN ISLAND NI	12.3N	83.1W	1602	3.83M/12.6FT	22	
SANTA MARTA CO	11.2N	74.2W	1536	2.01M/	6.6FT	16
SAPZURRO CO	8.7N	77.4W	1527	1.78M/	5.8FT	24
ISLA NAVAL CO	10.2N	75.8W	1524	1.48M/	4.8FT	14
BOCAS DEL TORO PA	9.4N	82.3W	1510	3.88M/12.7FT	20	
SAN ANDRES CO	12.6N	81.7W	1455	4.81M/15.8FT	24	
LIMON CR	10.0N	83.0W	1456	3.22M/10.6FT	22	
EL PORVENIR PA	9.6N	78.9W	1445	2.37M/	7.8FT	16

TEST... NEXT UPDATE AND ADDITIONAL INFORMATION ...TEST

-----

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

\* THIS IS A TEST MESSAGE. AUTHORITATIVE INFORMATION ABOUT THE  
EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON  
THE INTERNET AT [EARTHQUAKE.USGS.GOV](http://EARTHQUAKE.USGS.GOV).

\* THIS IS A TEST MESSAGE. FURTHER INFORMATION ABOUT THIS EVENT  
MAY BE FOUND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).

\* THIS IS A TEST MESSAGE. 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 WWW.TSUNAMI.GOV.

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

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ANNEX VII

**SAMPLE PRESS RELEASE FOR LOCAL MEDIA**

TEMPLATE FOR NEWS RELEASE

USE AGENCY MASTHEAD

Contact: (insert name)

**FOR IMMEDIATE RELEASE**

(insert phone number)

(insert date)

(insert email address)

**CARIBBEAN TSUNAMI EXERCISE TO BE CONDUCTED MARCH 10, 2022**

(insert community/county/state name) will join other localities in the Caribbean as a participant in a tsunami response exercise on March 10, 2022. The purpose of this exercise is to evaluate national and local tsunami response plans, increase tsunami preparedness, and improve coordination throughout the region. This exercise includes two simulated scenarios of an earthquake occurrence in Western Muertos Trough, South of Dominican Republic and Panama.

(insert a promotional comment from a local official, such as “The 2010 Haiti, 2010, 2014, 2015 Chilean, 2011 Japan, and the recent 2018 Sulawesi and 2021 New Zealand earthquakes and tsunamis have reminded the world 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 22, will simulate a widespread Tsunami Threat situation throughout the Caribbean, which requires implementation of national and local tsunami response plans. The exercise will (insert “include” or “not include”) public notification.

The exercise will simulate (insert description of chosen scenario - source and appropriate local time) on March 10, 2022. A handbook has been prepared which describes the scenarios and contains tsunami messages from the Pacific Tsunami Warning Center (PTWC). The PTWC is the 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), EMIZ Antillas and the U.S. National Oceanic and Atmospheric Administration (NOAA).

For more information on the U.S. tsunami warning system, see <https://www.tsunami.gov>.

For more information on the ICG/CARIBE-EWS, see  
[http://ioc-tsunami.org/index.php?option=com\\_content&view=article&id=9&Itemid=375&lang=en](http://ioc-tsunami.org/index.php?option=com_content&view=article&id=9&Itemid=375&lang=en)

###

On the Web:

ICG/CARIBE EWS	<a href="http://www.ioc-tsunami.org">http://www.ioc-tsunami.org</a>
Pacific Tsunami Warning Center	<a href="https://tsunami.gov">https://tsunami.gov</a>
NOAA Tsunami Program	<a href="https://www.tsunami.gov">https://www.tsunami.gov</a>
Caribbean Tsunami Warning Program	<a href="https://www.weather.gov/ctwp/">https://www.weather.gov/ctwp/</a>
Caribbean Tsunami Information Centre	<a href="https://www.ctic.ioc-unesco.org">https://www.ctic.ioc-unesco.org</a>

*Insert state/local emergency response URLs*

ANNEX VIII

**LIST OF ACRONYMS**

<b>AISR</b>	Aeronautical Information System Replacement
<b>AWIPS</b>	Advanced Weather Interactive Processing System
<b>CDEMA</b>	Caribbean Disaster Emergency Management Agency
<b>CEPREDENAC</b>	Coordination Centre for the Prevention of Natural Disasters in Central America
<b>CTIC</b>	Caribbean Tsunami Information Centre
<b>CW</b>	Caribe Wave
<b>EAS</b>	Emergency Alert System
<b>EMIZA</b>	Etat-Major Interministériel de la Zone de Défense et de Sécurité Antilles
<b>EMO</b>	Emergency Management Organization
<b>EMWIN</b>	Emergency Managers Weather Information Network
<b>EOC</b>	Emergency Operations Center
<b>EOP</b>	Emergency Operations Plan
<b>GDP</b>	Gross Domestic Product
<b>GMT</b>	Generic Mapping Tool
<b>GTS</b>	Global Telecommunication System
<b>ICG</b>	Intergovernmental Coordination Group
<b>ICG/CARIBE-EWS</b>	Intergovernmental Coordination Group for the Tsunami and other Coastal Hazards Warning System for the Caribbean and Adjacent Regions
<b>IOC</b>	Intergovernmental Oceanographic Commission of UNESCO
<b>ITIC</b>	International Tsunami Information Center
<b>MS</b>	Member States
<b>MT</b>	Muertos Trough
<b>NCEI</b>	National Centers for Environmental Information
<b>NOAA</b>	U.S. National Oceanic and Atmospheric Administration
<b>NPDB</b>	North Panama Deformed Belt

<b>NTWC</b>	National Tsunami Warning Centre
<b>NWWS</b>	NOAA Weather Wire Service
<b>PAGER</b>	Prompt Assessment of Global Earthquakes for Response
<b>PRSN</b>	Puerto Rico Seismic Network
<b>PTWC</b>	Pacific Tsunami Warning Center
<b>SCDB</b>	Southern Caribbean Deformed Belt
<b>SOP</b>	Standard Operating Procedures
<b>SRC</b>	Seismic Research Centre
<b>TER</b>	Tsunami Emergency Response
<b>TT</b>	Task Team
<b>TWFP</b>	Tsunami Warning Focal Points
<b>UNESCO</b>	United Nations Educational, Scientific, and Cultural Organization
<b>USGS</b>	United States Geological Survey
<b>WMO</b>	World Meteorological Organization

**IOC Technical Series**

<b>No.</b>	<b>Title</b>	<b>Languages</b>
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 Interecalibration 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
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