



# CARIBE WAVE 17 – And a Glimpse at '18

## NTHMP/WCS – May 5, 2017

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NOAA NWS Caribbean Tsunami Warning Program- Manager  
ICG CARIBE EWS Chair

# Institutional Reference Frame for the Exercise

**UNESCO:** The United Nations Educational, Scientific, and Cultural Organization

**IOC:** UNESCO Intergovernmental Oceanographic Commission

**ICG/CARIBE EWS:** UNESCO IOC Intergovernmental Coordination Group for Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions

**CTIC:** Caribbean Tsunami Information Centre; A Government of Barbados UNESCO/ IOC Partnership

**NOAA:** National Oceanic and Atmospheric Administration, U.S. Department of Commerce

**PTWC:** NOAA Pacific Tsunami Warning Center (CARIBE EWS Tsunami Service Provider)

**CTWP:** NOAA Caribbean Tsunami Warning Program

**CEPREDENAC:** Coordination for Natural Disaster Prevention Center in Central America.

**CDEMA:** Caribbean Disaster and Emergency Management Agency

**EMIZ Antilles:** French West Indies Zone Disaster Management Authority

# Timeline

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

# Objectives

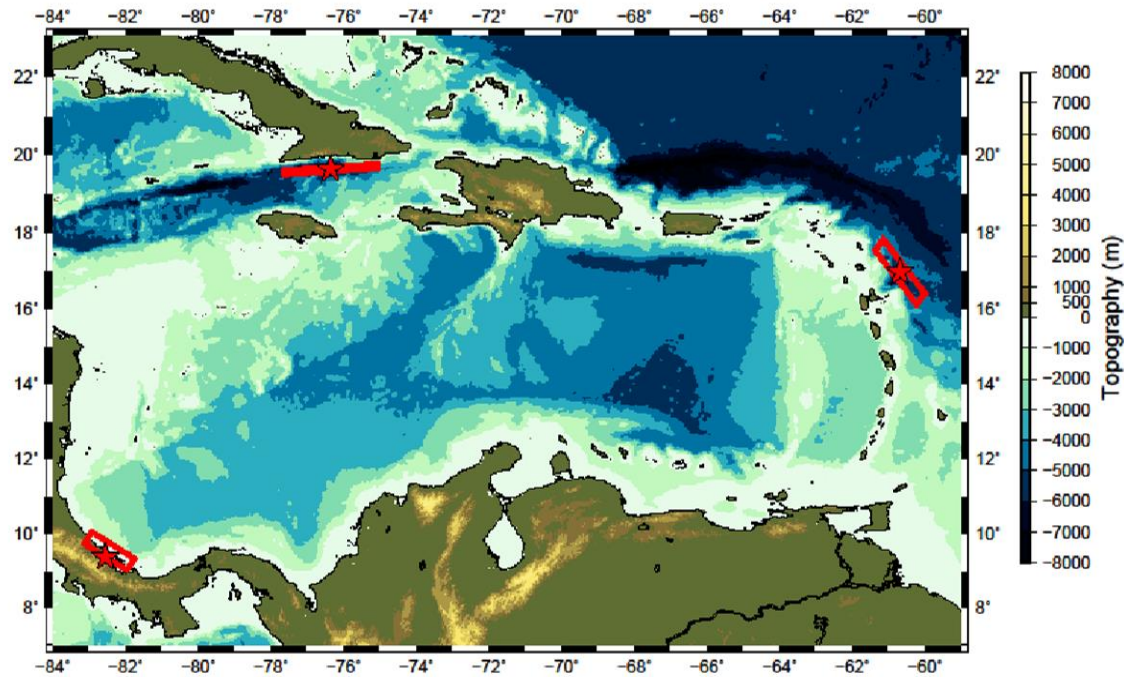
- 1. To exercise and evaluate operations of the CARIBE EWS Tsunami Warning System.**
  - A. Validate the issuance of tsunami products from the PTWC.**
  - B. Validate the receipt of tsunami products by CARIBE EWS Tsunami Warning Focal Points (TWFPs) and/or National Tsunami Warning Centers NTWCs).**
- 2. To evaluate the use of PTWC CARIBE EWS products.**
- 3. To validate the readiness to respond to a tsunami.**
  - A. Validate the operational readiness of the TWFPs/ NTWCs and/or the National Disaster Management Office (NDMO).**
  - B. To improve operational readiness. Before the exercise, ensure appropriate tools and response plan(s) have been developed, including public education materials.**
  - C. Validate that the dissemination of warnings and information/advice by TWFPs, and NTWCs, to relevant in-country agencies and the public is accurate and timely.**
  - D. Validate the organizational decision-making process (tsunami response plans) about public warnings and evacuations.**
  - E. Validate that the methods used to notify and instruct the public are accurate and timely.**
  - F. Evaluate the status of the implementation of the Tsunami Ready recognition program.**

# Goals/ Metrics

Goal	2013 Result	2014 Metric	2014 Result	2015 Metric	2015 Result	2016 Metric	2016 Result	2017 Metric
<b>Participation of Member States of ICG CARIBE EWS with designated focal warning point</b>	94%	95%	98% (including two MS/Territory unofficial)	95%	100%	100%	100%	100%
<b>Compliance with the timeline</b>	Close to 100%	100%	Almost 100%	100%	Almost 100%	100%	Almost 100%	100%
<b>Community involvement (beyond TWFP)</b>	75%	75%	75%	80%	66%	85%	73%	90%
<b>Number of participants</b>	44,000	+10%	191,000	+10%	191,420	+10%	332,814	+10%
<b>TWFP receive the dummy message</b>	98%	100%	94%	100%	90%	100%	84%	100%
<b>Countries who participate submit exercise questionnaire</b>	90%	100%	100%	100%	91%	100%	100%	100%

# CARIBE WAVE 17

## Earthquake and Tsunami Scenarios



Scenario	Origin Time	Mw	Epicenter
Costa Rica	14:00:00 UTC March 21, 2017	7.9	9.37°, -82.54°
Cuba		8.2	19.625°, -76.35°
Northeastern Lesser Antilles		8.5	16.96°, -60.69°

# Exercise Manuals

- The exercise manuals are available at [www.caribewave.info](http://www.caribewave.info)
- The manual includes:
  - Tsunami and earthquake scenarios description
  - Timelines
  - PTWC International dummy message and simulated exercise threat messages
  - Travel times and expected wave heights
  - The website link to post-exercise evaluation questionnaire

Simulated International Products issued by  
PTWC

Appendix F. TWC Exercise Messages  
Northeastern Antilles Earthquake Scenario

The following messages created for the CARIBE WAVE 17 tsunami exercise are representative of the official standard products issued by the PTWC during a large magnitude 8.5 earthquake and tsunami originating in the Northeastern Antilles. During a real event, the TWCs would also issue graphical and html-based products to their web sites and via RSS. The alerts would persist longer during a real event than is depicted in this exercise.

PTWC Message #1

ZCZC  
WECA41 PHEB 211405  
TSUCAX

WMO ID

AWIPS ID

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

...TSUNAMI THREAT MESSAGE...

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

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

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

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

PRELIMINARY EARTHQUAKE PARAMETERS

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

EVALUATION

- \* AN EARTHQUAKE WITH A PRELIMINARY MAGNITUDE OF 8.3 OCCURRED IN THE LEEWARD ISLANDS AT 1400 UTC ON TUESDAY MARCH 21 2017.
- \* BASED ON THE PRELIMINARY EARTHQUAKE PARAMETERS... WIDESPREAD HAZARDOUS TSUNAMI WAVES ARE POSSIBLE.

TSUNAMI THREAT FORECAST

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

MONTserrat... GUADELOUPE... DOMINICA... SAINT LUCIA...  
MARTINIQUE... ANTIGUA... BARBUDA... SINT EUSTATIUS...  
SAINT KITTS... SABA... BARBADOS... ANGUILLA... US VIRGIN IS...  
SAINT VINCENT... BR VIRGIN IS... SINT MAARTEN...  
PUERTO RICO... SAINT BARTHELEMY... SAINT MARTIN...  
GRENADA... DOMINICAN REP... TURKS N CAICOS... TRINIDAD  
TOBAGO... HAITI... BONAIRE... BAHAMAS... CUBA... ARUBA...  
VENEZUELA... BERMUDA... CURACAO... CAYMAN ISLANDS...  
COLOMBIA AND JAMAICA

RECOMMENDED ACTIONS

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

ESTIMATED TIMES OF ARRIVAL

- \* ESTIMATED TIMES OF ARRIVAL -ETA- OF THE INITIAL TSUNAMI WAVE FOR PLACES WITHIN 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.

POTENTIAL IMPACTS

- \* A TSUNAMI IS A SERIES OF WAVES. THE TIME BETWEEN WAVE CRESTS CAN VARY FROM 5 MINUTES TO AN HOUR. THE HAZARD MAY PERSIST FOR MANY HOURS OR LONGER AFTER THE INITIAL WAVE.
- \* IMPACTS CAN VARY SIGNIFICANTLY FROM ONE SECTION OF COAST TO THE NEXT DUE TO LOCAL BATHYMETRY AND THE SHAPE AND ELEVATION OF THE SHORELINE.
- \* IMPACTS CAN ALSO VARY DEPENDING UPON THE STATE OF THE TIDE AT THE TIME OF THE MAXIMUM TSUNAMI WAVES.
- \* PERSONS CAUGHT IN THE WATER OF A TSUNAMI MAY DROWN... BE CRUSHED BY DEBRIS IN THE WATER... OR BE SWEEPED OUT TO SEA.

TSUNAMI OBSERVATIONS

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

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

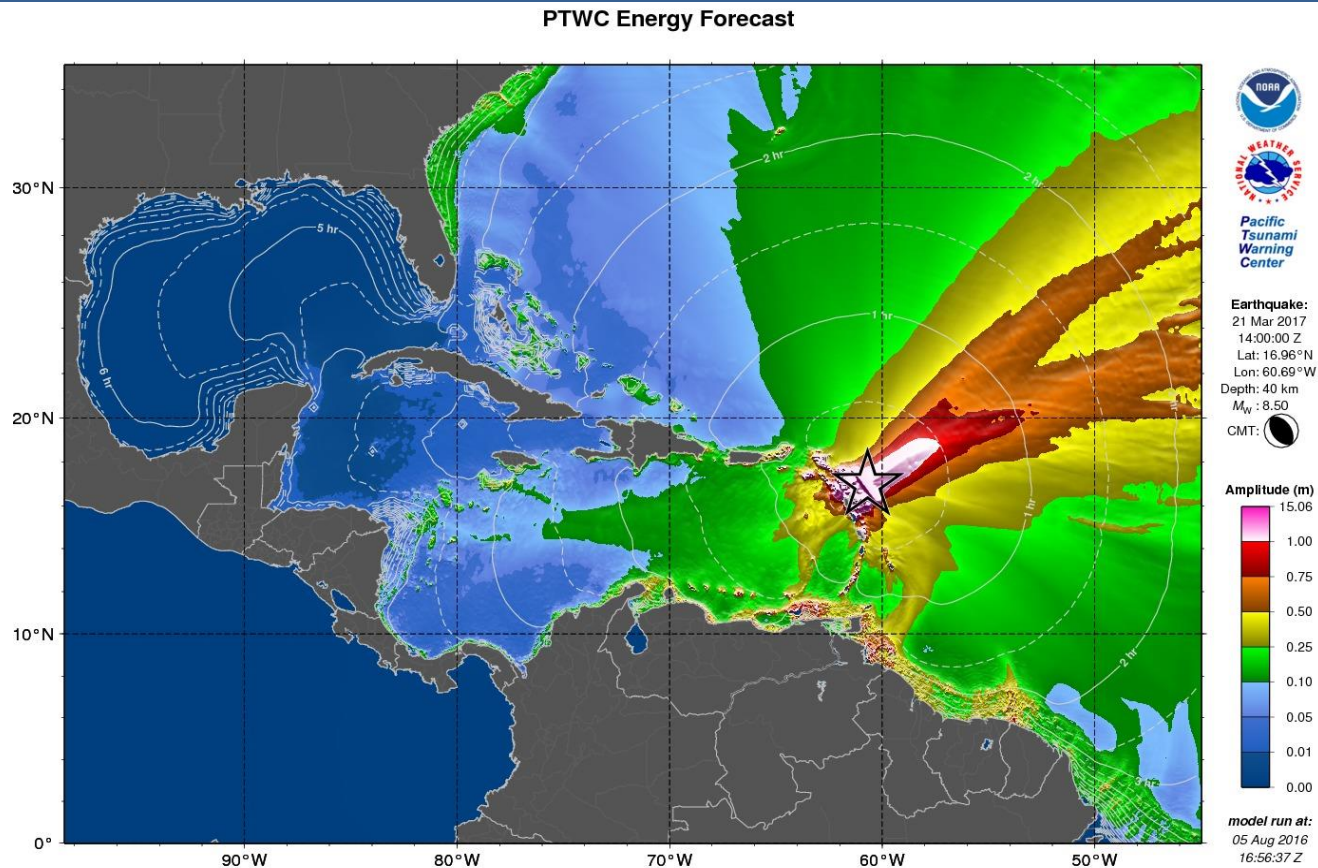
NEXT UPDATE AND ADDITIONAL INFORMATION

- \* THE NEXT MESSAGE WILL BE ISSUED IN ONE HOUR... OR SOONER IF THE SITUATION WARRANTS.
- \* AUTHORITATIVE INFORMATION ABOUT THE EARTHQUAKE FROM THE U.S. GEOLOGICAL SURVEY CAN BE FOUND ON THE INTERNET AT [EARTHQUAKE.USGS.GOV/EARTHQUAKES](http://EARTHQUAKE.USGS.GOV/EARTHQUAKES) -ALL IN LOWERCASE LETTERS-.
- \* FURTHER INFORMATION ABOUT THIS EVENT MAY BE FOUND AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV) AND AT [WWW.TSUNAMI.GOV](http://WWW.TSUNAMI.GOV).
- \* COASTAL REGIONS OF PUERTO RICO... THE U.S. VIRGIN ISLANDS... AND THE BRITISH VIRGIN ISLANDS SHOULD REFER TO PACIFIC TSUNAMI WARNING CENTER MESSAGES SPECIFICALLY FOR THOSE PLACES THAT CAN BE FOUND AT [PTWC.WEATHER.GOV](http://PTWC.WEATHER.GOV).
- \* COASTAL REGIONS OF THE US GULF COAST... US EAST COAST... AND THE MARITIME PROVINCES OF CANADA SHOULD REFER TO U.S. NATIONAL TSUNAMI WARNING CENTER MESSAGES THAT CAN BE FOUND AT [NTWC.ARH.NOAA.GOV](http://NTWC.ARH.NOAA.GOV).

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NNNN

# Energy Forecast for Tsunami Wave Heights

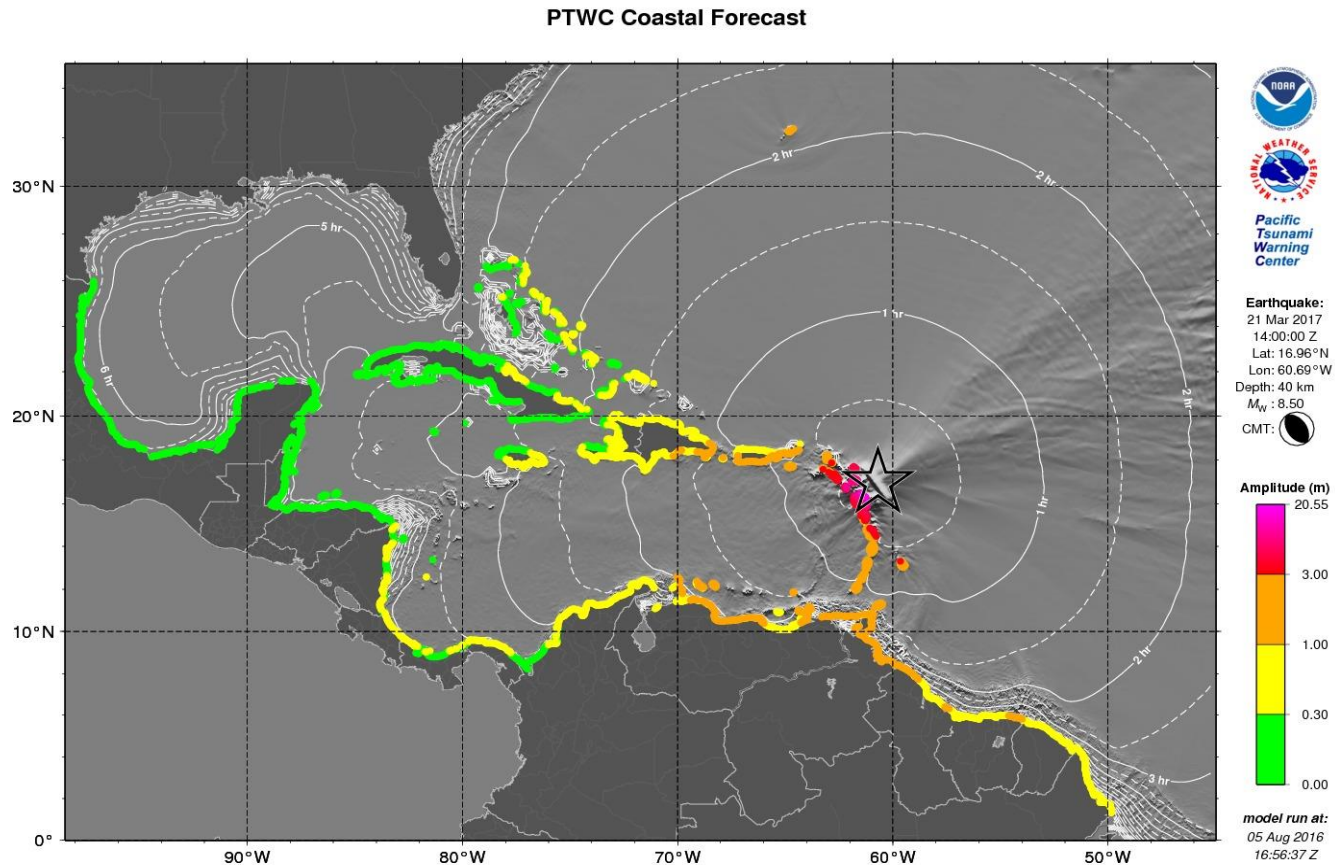
## Northeastern Lesser Antilles



**RIFT maximum amplitude map for the Southeastern portion of the Caribbean Sea scenario for Northeastern Lesser Antilles.**

During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

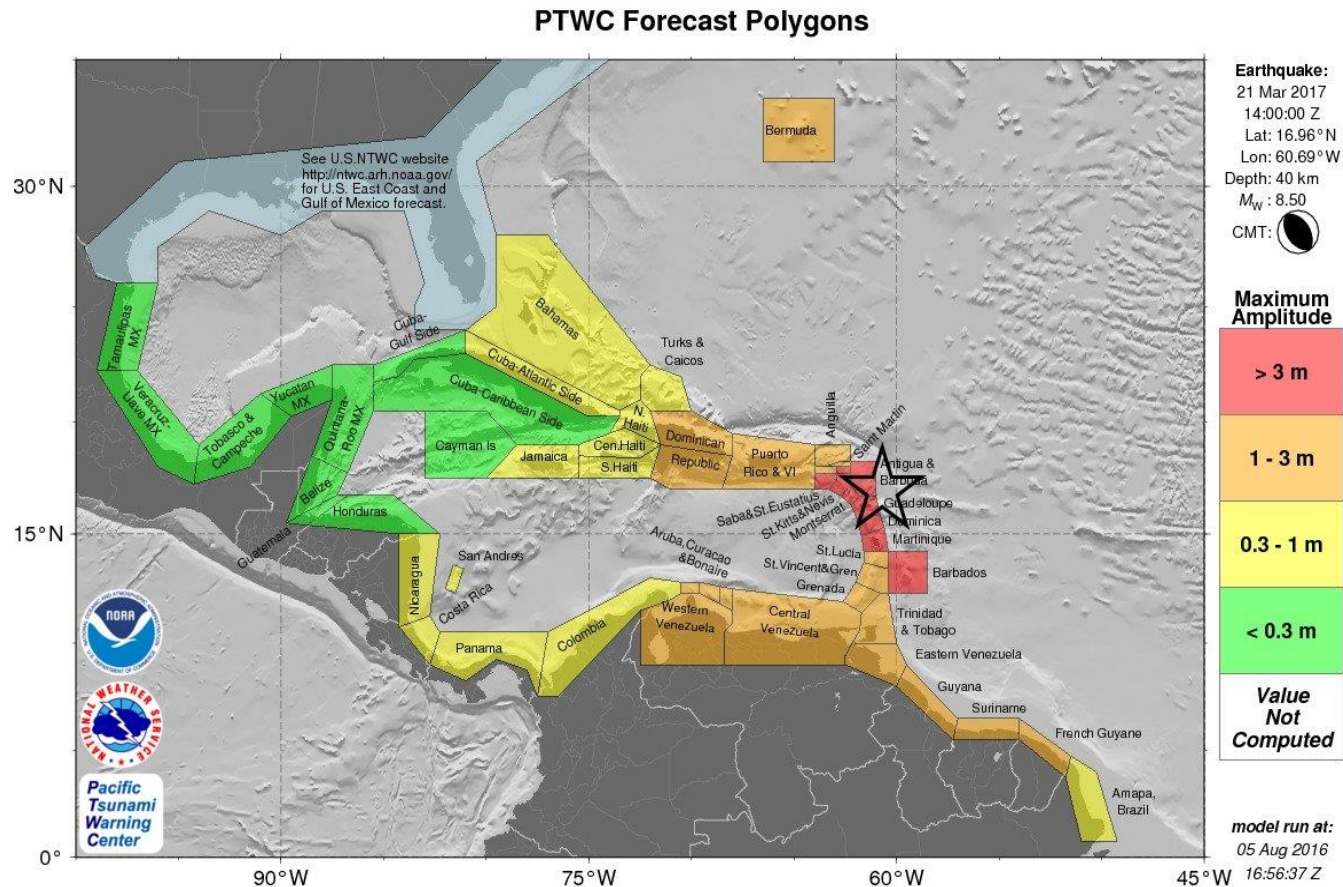
# Coastal Forecast for Tsunami Wave Heights Northeastern Antilles



**RIFT coastal tsunami amplitude map for the Southeastern portion of the Caribbean Sea scenario for Northeastern Antilles.**

During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami.

# Polygons Forecast for Tsunami Wave Heights Northeastern Lesser Antilles

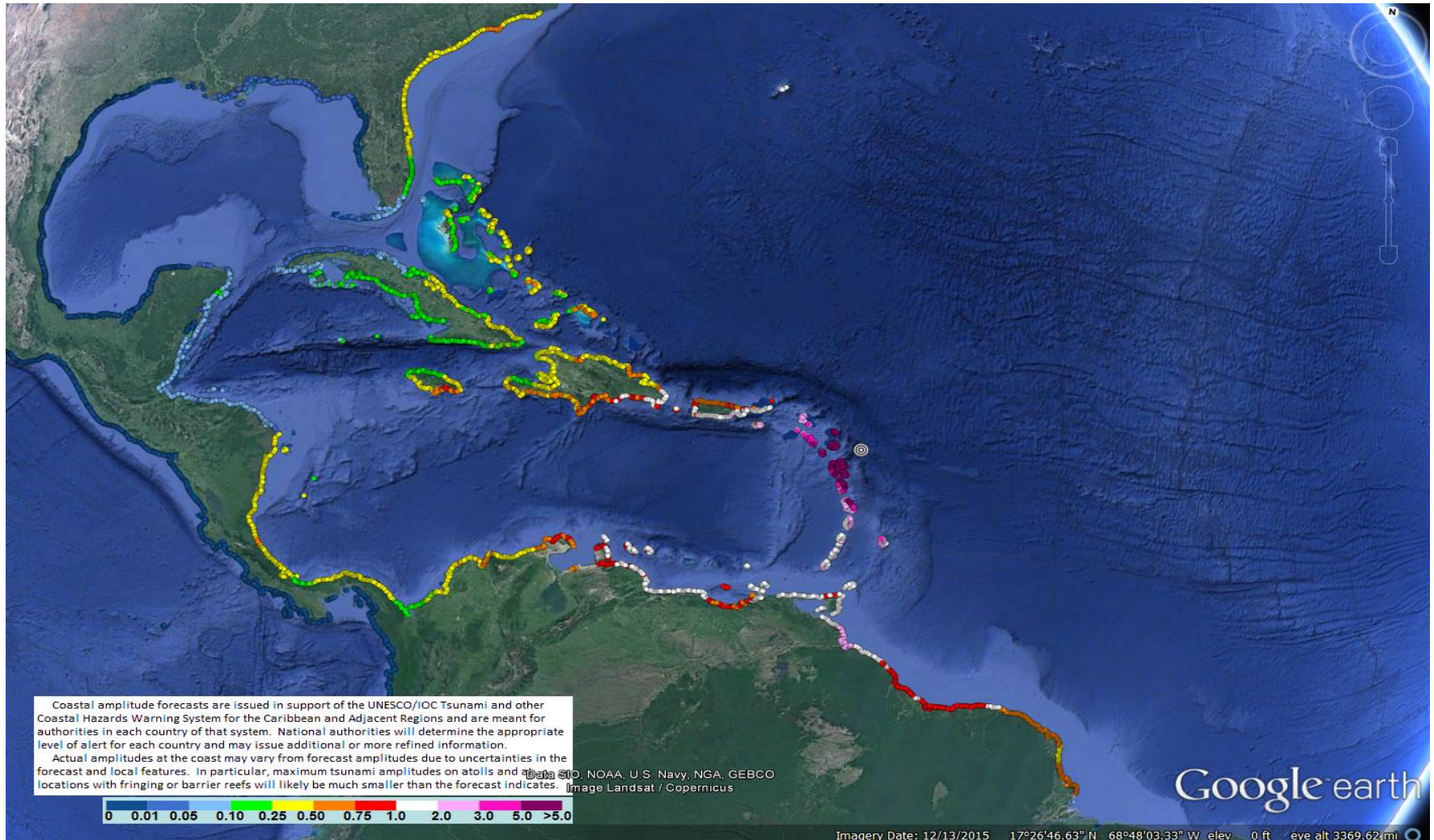


**RIFT forecast polygons for the Caribbean region on the Northeastern Antilles scenario.**

During a real event this product will only be made available to officially designated Tsunami Warning Focal Points and National Tsunami Warning Centers.

KMZ

# Northeastern Lesser Antilles



# PTWC Simulated Domestic Products

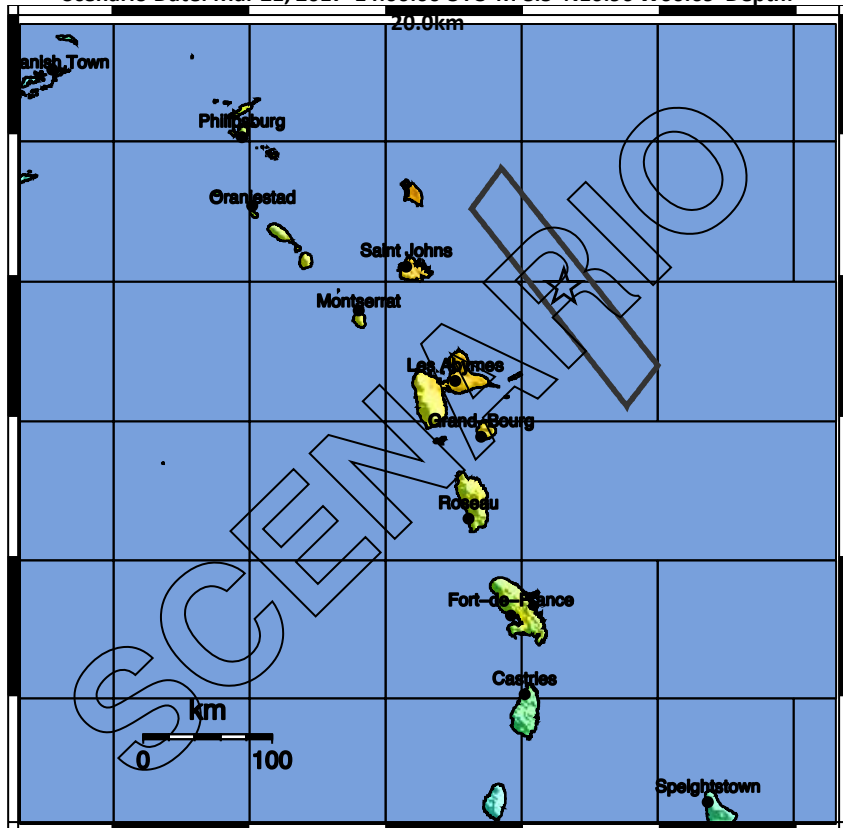
- These were issued only via email to those agencies that are registered to receive the official products thru this mechanism (NWS SJFO, PRSEMA, PRSN)
- The simulated products included:
  - Warning @ 14:05 UTC
  - Advisory a couple of hours later
  - Cancellation @ 21:25
- The EAS and NOAA Weather Radio was activated (tested), NO test messages were disseminated over WEA (Wireless Emergency Alerts), as would be the case for a real event.

# Caribe Wave includes USGS Earthquake Impact Scenarios

--- Earthquake Planning Scenario ---

## ShakeMap for Northeastern Antilles Scenario

Scenario Date: Mar 21, 2017 14:00:00 UTC M 8.5 N16.96 W60.69 Depth:



PLANNING SCENARIO ONLY — Map Version 9 Processed 2016-08-12 19:25:02 UTC

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

Scale based upon Worden et al. (2012)



Earthquake Shaking Yellow Alert



## M 8.5, Northeastern Antilles: Caribe Wave 17

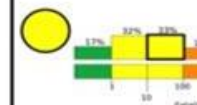
Origin Time: 2017-03-21 14:00:00 UTC (10:00:00 local)

Location: 16.96°N 60.69°W Depth: 20km

FOR TSUNAMI INFORMATION, SEE: [tsunami.gov](http://tsunami.gov)

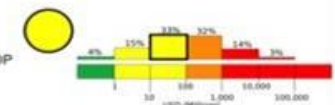
Created: 48 minutes, 0 seconds after earthquake

### Estimated Fatalities



Yellow alert for shaking-related fatalities and economic losses. Some casualties and damage are possible and the impact should be relatively localized. Past yellow alerts have required a local or regional level response. Estimated economic losses are 1-7% GDP of Guadeloupe.

### Estimated Economic Losses



### Estimated Population Exposed to Earthquake Shaking

ESTIMATED POPULATION EXPOSURE (k = x1000)	--*	--*	171k*	394k*	663k*	364k	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	Resistant Structures: none	Resistant Structures: none	Resistant Structures: V. Light	Resistant Structures: Light	Resistant Structures: Moderate	Resistant Structures: Moderate/Heavy	Resistant Structures: Heavy	Resistant Structures: V. Heavy
POTENTIAL DAMAGE	Vulnerable Structures: none	Vulnerable Structures: none	Vulnerable Structures: none	Vulnerable Structures: Light	Vulnerable Structures: Moderate	Vulnerable Structures: Moderate/Heavy	Vulnerable Structures: Heavy	Vulnerable Structures: V. Heavy	Vulnerable Structures: 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 vulnerable to earthquake shaking, though some resistant structures exist. The predominant vulnerable building types are reinforced concrete and informal (metal, timber, GI etc.) construction.

### Historical Earthquakes (with MMI levels):

Date (UTC)	Dist. (km)	Mag.	MMI(°)	Deaths
1985-03-16	186	6.4	VII(6k)	0
1974-10-08	143	7.5	VIII(40k)	0
2004-11-21	179	6.3	VII(3k)	1

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

### Selected City Exposure

MMI City	Population
VII Piggotts	<1k
VII Saint John's	24k
VII Parham	<1k
VII All Saints	3k
VII Le Moule	23k
VII Potters Village	1k
VI Roseau	17k
VI Basseterre	13k
VI Fort-de-France	90k
IV Bridgetown	99k
IV Kingstown	25k

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/pager>

Event ID: uslna.m8.5.se

# Registration

Inicio Regiones del TsunamiZone Otros Idiomas Contacto Búsqueda Iniciar sesión

The TsunamiZone U.S. Virgin Islands Tsunami Preparedness Week March 19-25, 2017

¡inscríbete aquí! ¿Quiénes participan? CARIBE WAVE

### INSERIR SUS ACTIVIDADES DE PREPARACIÓN PARA LOS TSUNAMIS

- Si usted nunca se inscribió al TsunamiZone.org, utilice el formulario a la izquierda.
- Si usted se ha inscrito anteriormente al TsunamiZone.org, por favor conéctese a su cuenta con el formulario a la derecha.
- Si alguna vez inscribió su organización en el pasado, pero usted va a ser el registrante este año, cree una nueva inscripción con el formulario en la parte inferior.

#### ¿SE INSCRIBE POR PRIMERA VEZ?

COMIENCE su inscripción

¿A quién desea inscribir?

Seleccione...

Por favor seleccione su país:

Seleccione...

Seguir

#### ¿SE INSCRIBIÓ ANTERIORMENTE?

CONÉCTESE para renovar su inscripción

Introduzca su dirección de e-mail:

Contraseña:

Olvidó la contraseña.

Iniciar sesión

### VENTAJAS

Al inscribir sus actividades de preparación para tsunamis, usted o su organización:

- Será contactado como participante en el sitio web del TsunamiZone!
- Será incluido junto con otros participantes en su área (opcional).
- Será un ejemplo que anime a los demás a participar y prepararse.
- Estará actualizado con las noticias TsunamiZone y los consejos de preparación.
- También la tranquilidad de saber que usted, su familia, sus colaboradores y muchos otros estarán mejor preparados para sobrevivir y recuperarse rápidamente cuando ocurre un tsunami.

Más de 120.000 participantes inscritos. ¡Gracias por haber participado! Por favor, ¡comparta sus actividades!

Si se produce un error al inscribirse o al conectarse a su cuenta, mande un e-mail a [info@tsunamizone.org](mailto:info@tsunamizone.org) para asistencia.

Inicio | Inscribirse | Iniciar sesión | ¿Quiénes? | Compartir sus actividades | CARIBE WAVE | Contacto | Privacidad | Programas adicionales

TsunamiZone.org (as of 2016-before had in house system)

English, Spanish and French

All Member States in a Followup survey submitted their participation numbers and a consolidated number of participants was determined

# CARIBE WAVE 2017

- 32 nations and 15 territories of the Caribbean and Adjacent Regions participated in this exercise with a total of 747,326 people engaged.
  - This represented a MS participation rate of 100% (same as previous two years) and an increase of individual participation of 124% (up from 332,814 in 2015) .

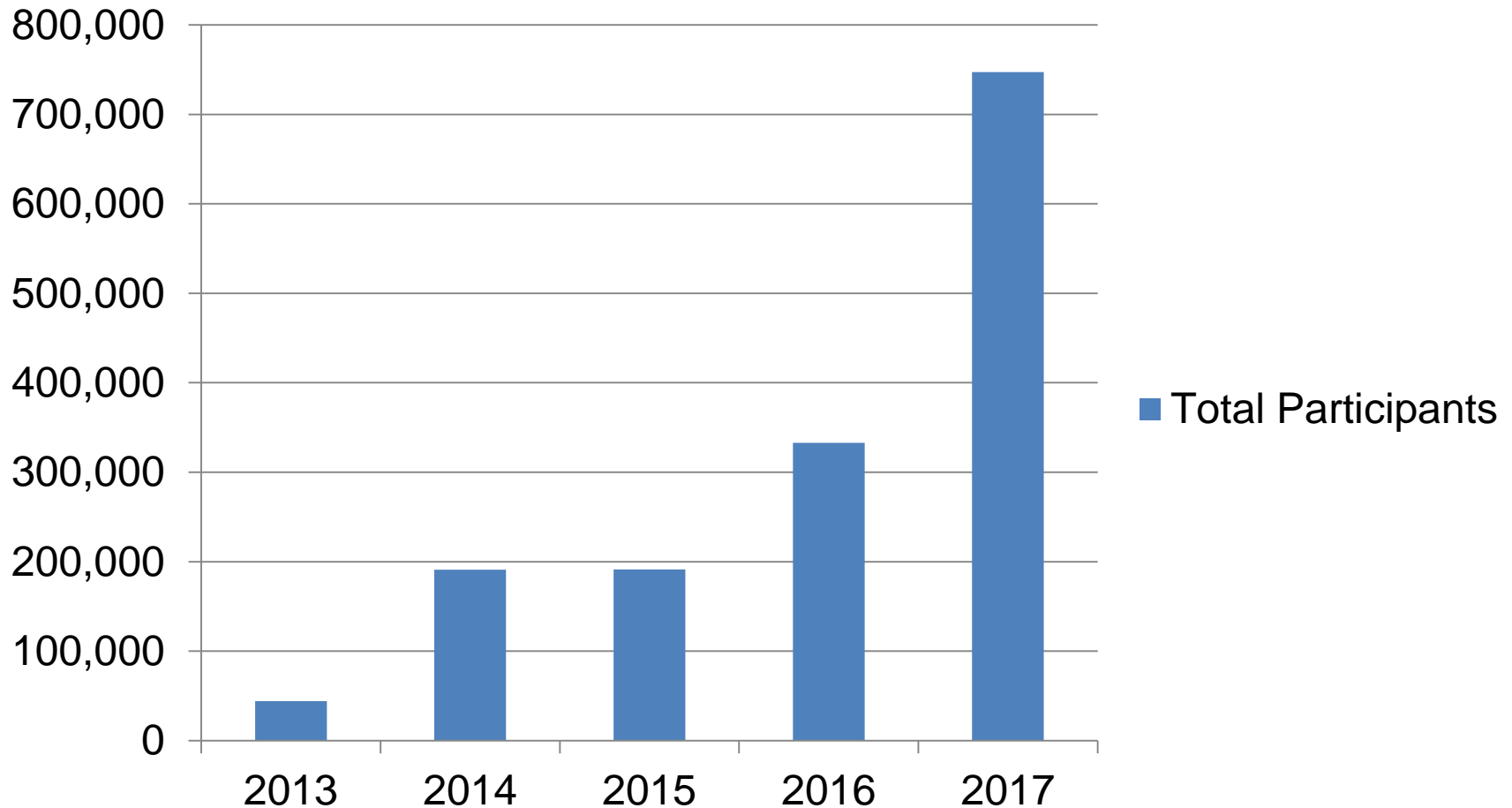


# Caribe Wave Actions



Country	Consolidated Number of Participants, 2016	Consolidated Number of Participants, 2017
Antigua & Barbuda	393	5000
Bahamas	5	5
Barbados	1,860	305
Belize	27	6
Brazil	10	10
Colombia	137	40
Costa Rica	200	50
Cuba	633	1000
Dominica	353	72
Dominican Republic	380	977
France (Guadeloupe, Martinique, St. Barhelemy, Sint Maarten)	88,685	200,000
Grenada	14,300	21,705
Guatemala	10	10
Guyana	10	21
Haiti	260	2891
Honduras	6	2000
Mexico	1,810	1000
Netherlands	5	20
NL- Aruba	3	9407
NL- Curacao	180	143
NL- Sint Maarten	1,400	1900
Nicaragua	525	30
Panama	5,958	7102
Saint Kitts and Nevis	3,320	2607
Saint Lucia	560	2606
Saint Vincent and the Grenadines	35	7
Trinidad and Tobago	279	11234
UK- Anguilla	1,160	1250
UK- Bermuda	158	160
UK- British Virgin Islands	4,762	7113
UK- Cayman Islands	20	30,000
UK- Turks and Caicos Islands	30	35
USA- Puerto Rico	140,875	153,398
USA- U.S. Virgin Islands	2,928	2135
Venezuela	61,390	283,000
<b>TOTAL</b>	<b>332,814</b>	<b>747,326</b>

# Caribe Wave Participation

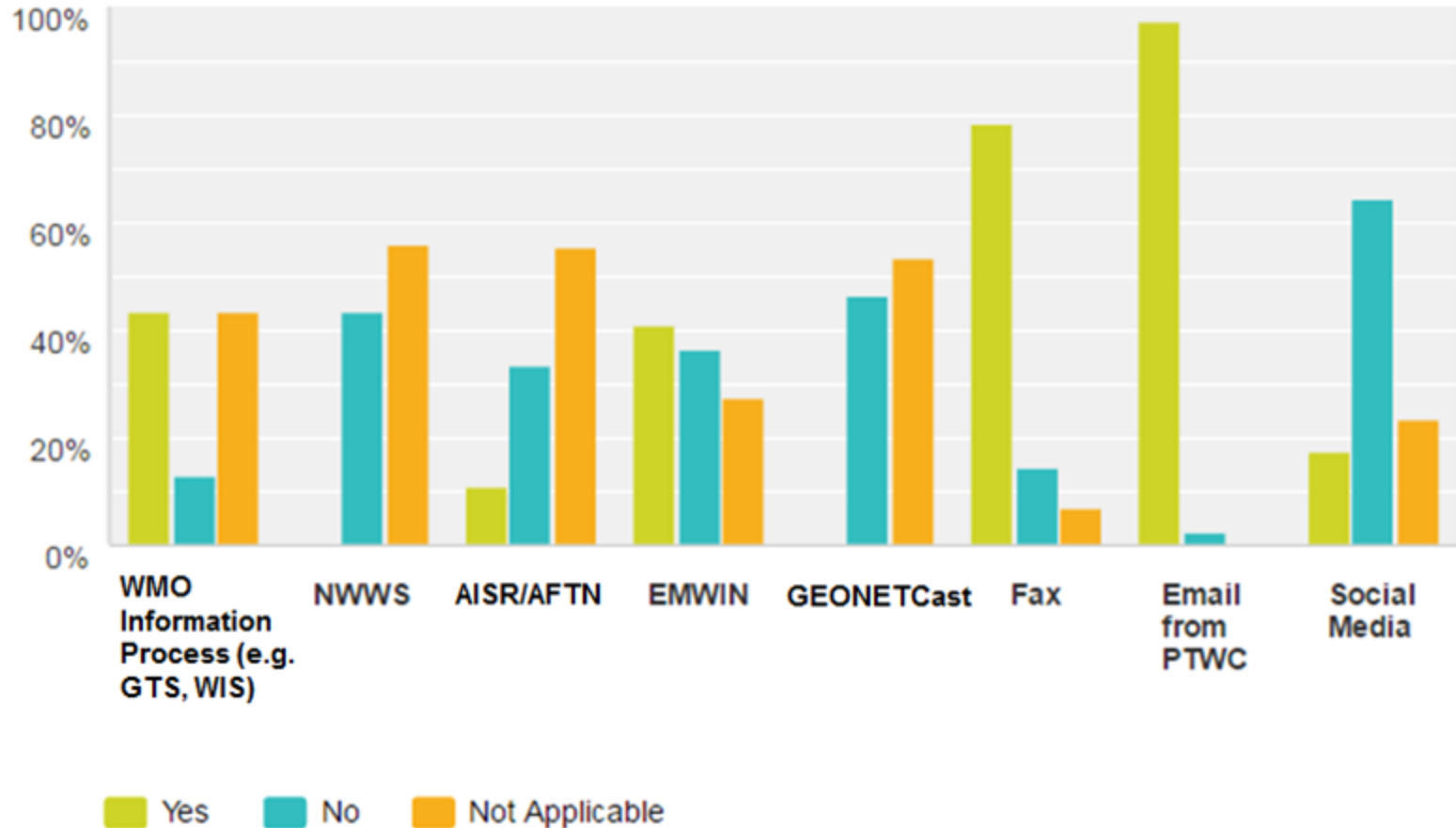


# CARIBE WAVE 17

## Earthquake and Tsunami Scenarios

- The initial dummy message for the three scenarios was issued by the CARIBE EWS Tsunami Service Provider [Pacific Tsunami Warning Center (PTWC)] on March 21, 2017 at 1400 UTC and disseminated over all its standard broadcast channels.
  - **Each country and territory chose one scenario and decided if and how to disseminate messages within its area of responsibility.**
  - **If the Member State did not inform the PTWC and CTWP, the organizers decided for which scenario the PTWC will send the products.**

# How TWFP received the Messages from PTWC



# Start of Exercise messages were also be sent out by PTWC twitter accounts

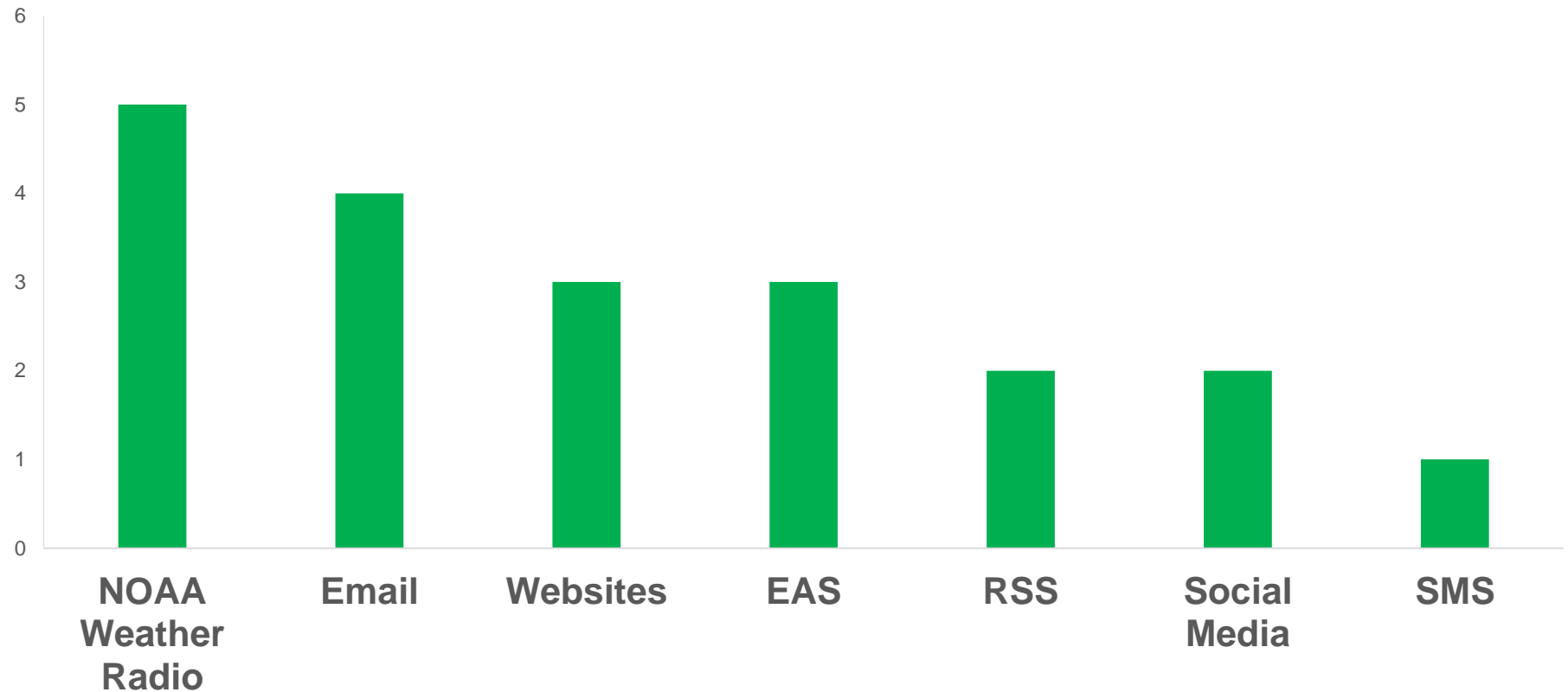
Users with US Cellphone providers can receive Tweets as text messages, sending  
as body message:

“Follow NWS\_PTWC” to 40404 (this account is for all PTWC  
products)

“Follow NWS\_CTWP” to 40404 (this account is only for PTWC  
products for the Caribbean and Adjacent Regions)

“This is a test message for the CARIBEWAVE17 tsunami exercise  
#CaribeWave” (will be issued at 14h00 UTC to NWS\_PTWC and  
NWS\_CTWP accounts/subscribers ).”

# Methods thru which the public received the message for Caribe Wave



# Post-Exercise Evaluation Form

- Each CARIBE EWS member state and territory is requested to provide feedback on the exercise.
  - This feedback assists the ICG/CARIBE-EWS in the evaluation of Caribe Wave 17 and the development of subsequent exercises, and help response agencies document lessons learned.
  - To facilitate feedback the online evaluation survey is used: <https://www.surveymonkey.com/r/CaribeWave17>
  - The deadline for completing the evaluation was April 3, 2017.
    - 64 questions (2016 were 83 questions), 11 pages, should take no more than 20 minutes.
    - 100% MS completed the questionnaire, the last one was completed May 4, 2017

# Resources

- 2 Webinars (English, Spanish and French) in January and March
- IOC Manual “How to plan, conduct and evaluate tsunami exercises” which will also be a useful resource.
- CARIBE WAVE 2011, 2013, 2014, 2015, 2016 and 2017 Handbooks
- CARIBE WAVE 2013, 2014, 2015, 2016 Final and Media Report and 2017 Draft Final and Media Reports
- PTWC Communications Plan for the Caribbean
- Available at [www.caribewave.info](http://www.caribewave.info)

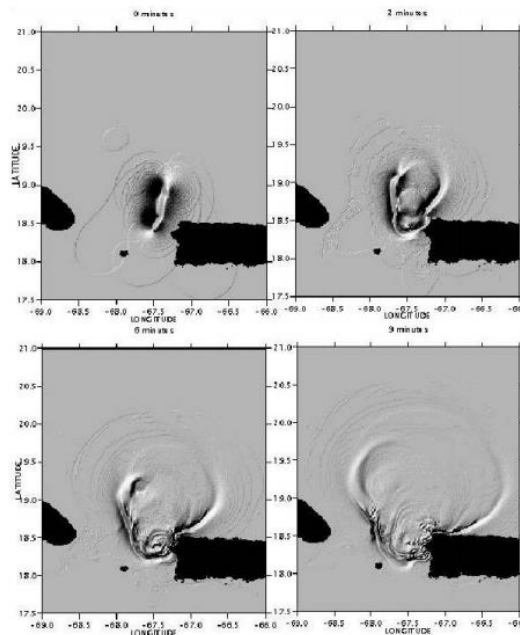
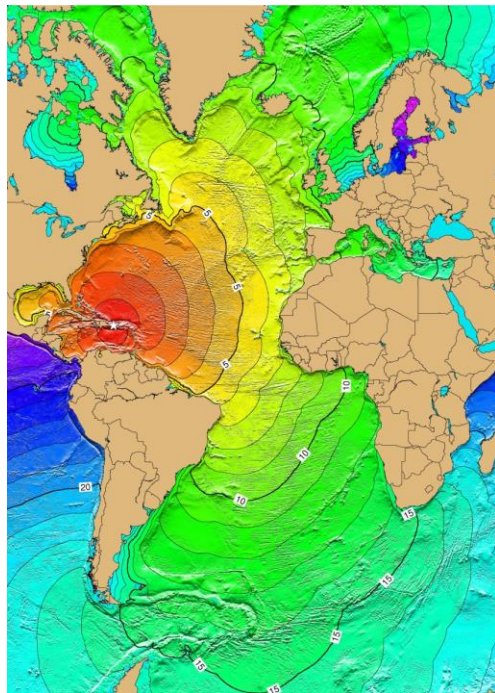
# CARIBE WAVE 17 Task Team

Person	Telephone #	Email
Patrick Tyburn, CARIBE WAVE 17 Chair, CARIBE EWS Chair WG4	596-596-393813	<a href="mailto:patrick.tyburn@martinique.pref.gouv.fr">patrick.tyburn@martinique.pref.gouv.fr</a>
Elizabeth Vanacore, PRSN, CARIBE WAVE past Chair	1-787-833-8433	<a href="mailto:elizabeth.vanacore@upr.edu">elizabeth.vanacore@upr.edu</a>
Christa von Hillebrandt-Andrade, CARIBE EWS Chair; NWS CTWP Manager	1-787-249-8307	<a href="mailto:christa.vonh@noaa.gov">christa.vonh@noaa.gov</a>
Milton Puentes, CARIBE EWS Vice Chair	57-1-2020490	<a href="mailto:milpuentes@gmail.com">milpuentes@gmail.com</a>
Gerard Metayer, CARIBE EWS Vice Chair	509-489-37805	<a href="mailto:gerard_metayer@yahoo.fr">gerard_metayer@yahoo.fr</a>
Paul Martens, CARIBE EWS Vice Chair	1-721-542-6669	<a href="mailto:Paul.Martens@sintmaartengov.org">Paul.Martens@sintmaartengov.org</a>
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# Caribe Wave '18

## TBC March 15, 2018

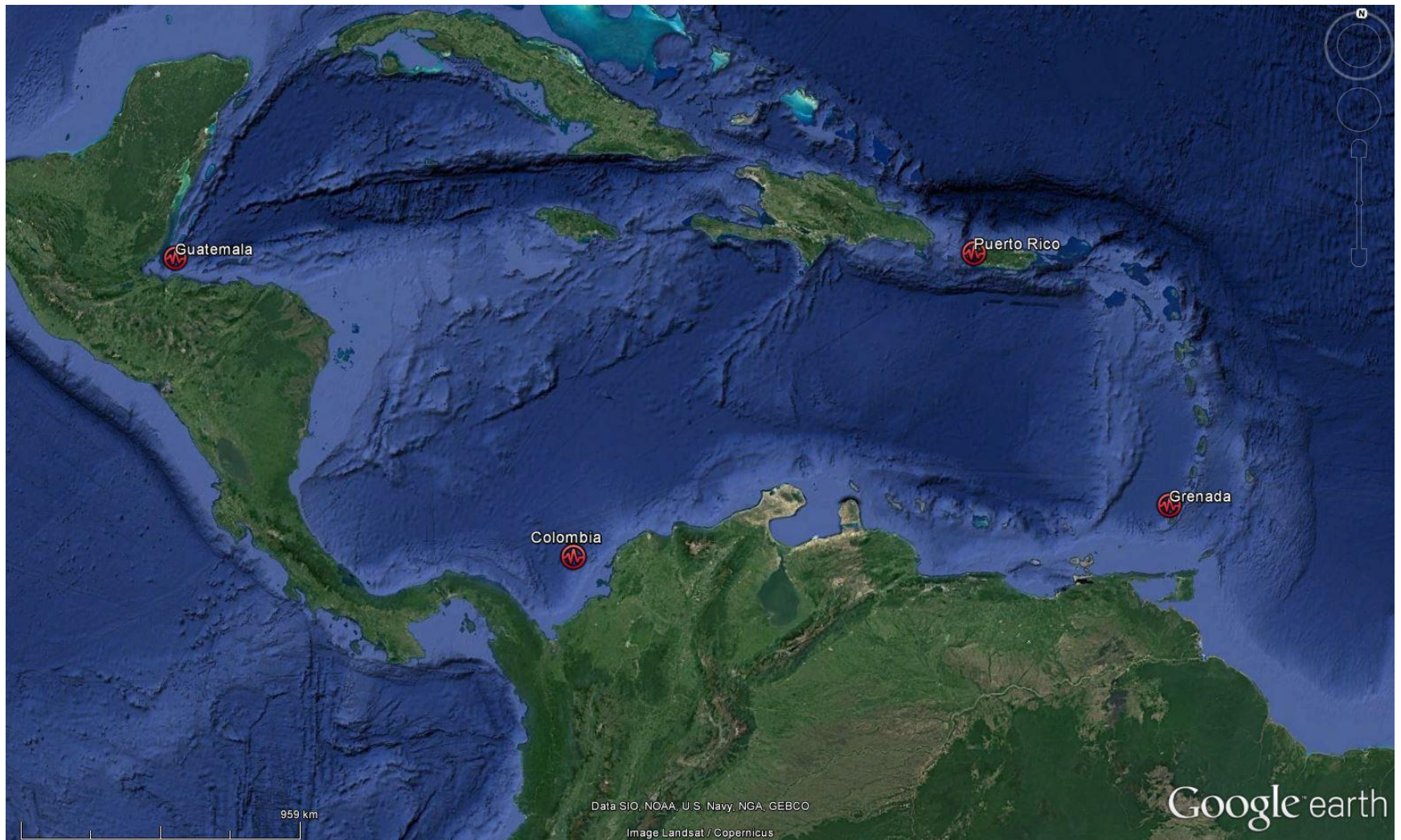
- Modelled after the 1918 Earthquake and Tsunami



Mercado, A. and Mc Cann, 1998

# Caribe Wave 18

## Possible Additional Scenarios



## Questions, Comments

Thank you

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