

Department of Geology
University of Puerto Rico, Mayagüez and
NOAA's Caribbean Tsunami Warning Program

CARIBE WAVE 2018

Supplement Report

May 2018

Supplement A. Survey Results

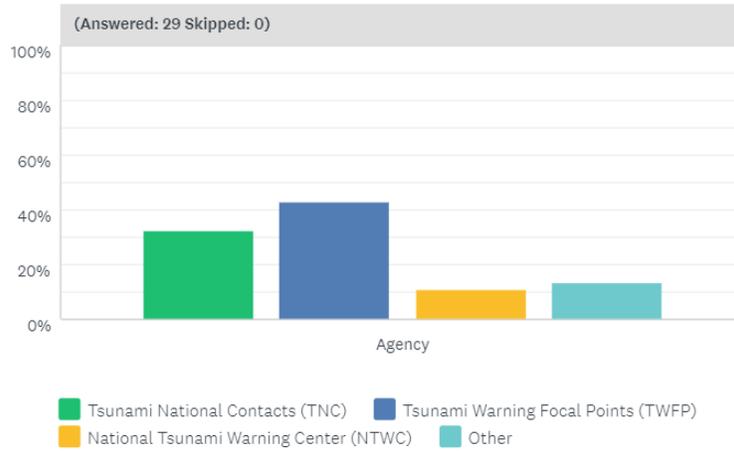
Caribe Wave 2018 Survey Report from TWFP/TNC

The following Member States and Territories participated in the post-exercise evaluation:

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

*One survey submitted by the Member States for all constituents

Contact Information - Agency

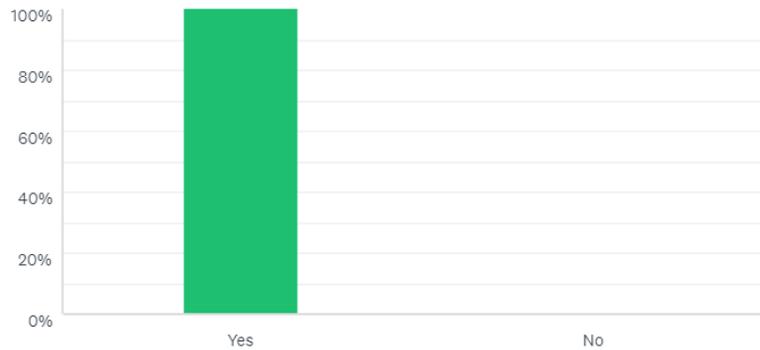


(Answered: 29 Skipped: 0)

	TSUNAMI NATIONAL CONTACTS (TNC)	TSUNAMI WARNING FOCAL POINTS (TWFP)	NATIONAL TSUNAMI WARNING CENTER (NTWC)	OTHER	TOTAL
Agency	32.43% 12	43.24% 16	10.81% 4	13.51% 5	37

Q4 Did your Member State/Territory participate in CARIBE WAVE 18?

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	100.00%	37
No	0.00%	0
TOTAL		37

Comments:

Antigua and Barbuda: Our focus this year was on Preschools in Tsunami Impact areas.

Belize: Three persons from the NMS participate. They encounter problems as the bulletins were only send to Chief Met Officer and Deputy Chief Met, who were both on leave. Only one bulletin came thru the fax.

Dominica: Due to the recovery process it's been difficult to plan.

Cuba: Se hicieron ejercicios en los institutos de Ciencias del Mar y Sismología así como en el Estado Mayor Nacional de la Defensa Civil y en la ciudad de Baracoa.

Curacao: It went perfect all messages were received and passed on to the stakeholders.

Trinidad and Tobago: TTMS is the designated TWFP for Trinidad and Tobago.

UK- Anguilla: Our participation this year was very low-key although a greater response was originally planned. The schools who usually participate well, were engaged in other activities and unable to participate.

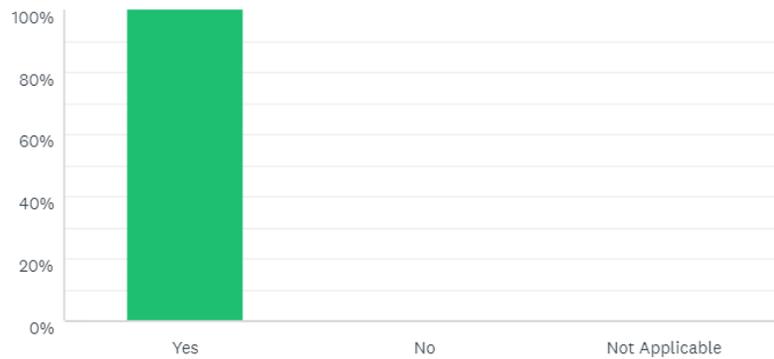
UK- Bermuda: In the capacity of a small table top exercise with a few different agencies.

UK- Cayman Islands: Mostly a mass notification test using a newly installed radio interrupt, messages to local media, and internal Government and NEOC notification procedures.

USA- US Virgin Islands: However, we were unable to test/activate our Tsunami Warning Sirens because the are not operable due to damages caused by Hurricanes Irma & Maria.

Q5 1B.1: The PTWC CARIBE WAVE 18 initial Dummy (Start of Exercise) Message was received by your country's Tsunami Warning Focal Point / National Tsunami Warning Center.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES	
▼ Yes	100.00%	37
▼ No	0.00%	0
▼ Not Applicable	0.00%	0
TOTAL		37

Comments:

Belize: It was only received by the TWFP and the Alternate.

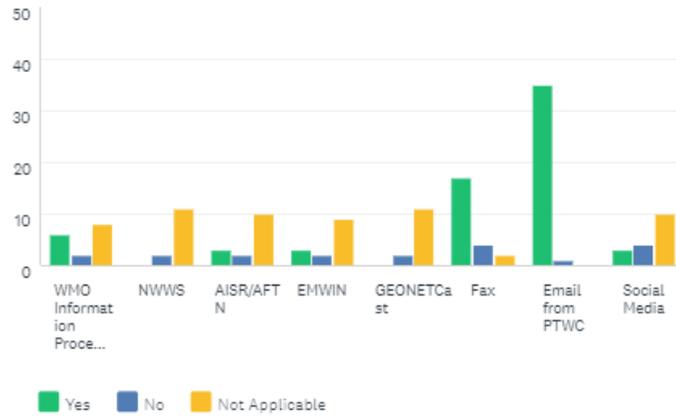
Cuba: Se recibió por correo electrónico.

Honduras: Fueron recibidos por el contacto focal y alterno en tiempo y forma.

Trinidad and Tobago: Answers to Sections One and Two to be answered by the TWFP/NTWC.

Q6 1B.2: The PTWC issued the CARIBE WAVE 18 initial Dummy Message by several methods. Please check all methods through which the message was received by the TWFP/NTWC.

Answered: 37 Skipped: 0



	YES	NO	NOT APPLICABLE	TOTAL RESPONDENTS
WMO Information Process (e.g., GTS, WIS)	37.50% 6	12.50% 2	50.00% 8	16
NWWS	0.00% 0	15.38% 2	84.62% 11	13
AISR/AFTN	20.00% 3	13.33% 2	66.67% 10	15
EMWIN	21.43% 3	14.29% 2	64.29% 9	14
GEONETCast	0.00% 0	15.38% 2	84.62% 11	13
Fax	73.91% 17	17.39% 4	8.70% 2	23
Email from PTWC	100.00% 35	2.86% 1	0.00% 0	35
Social Media	17.65% 3	23.53% 4	58.82% 10	17

Comments:

Bermuda: We used to have EMWIN, but with software updates etc. this is no longer operational.

Guatemala: Not received via email, could be internal program.

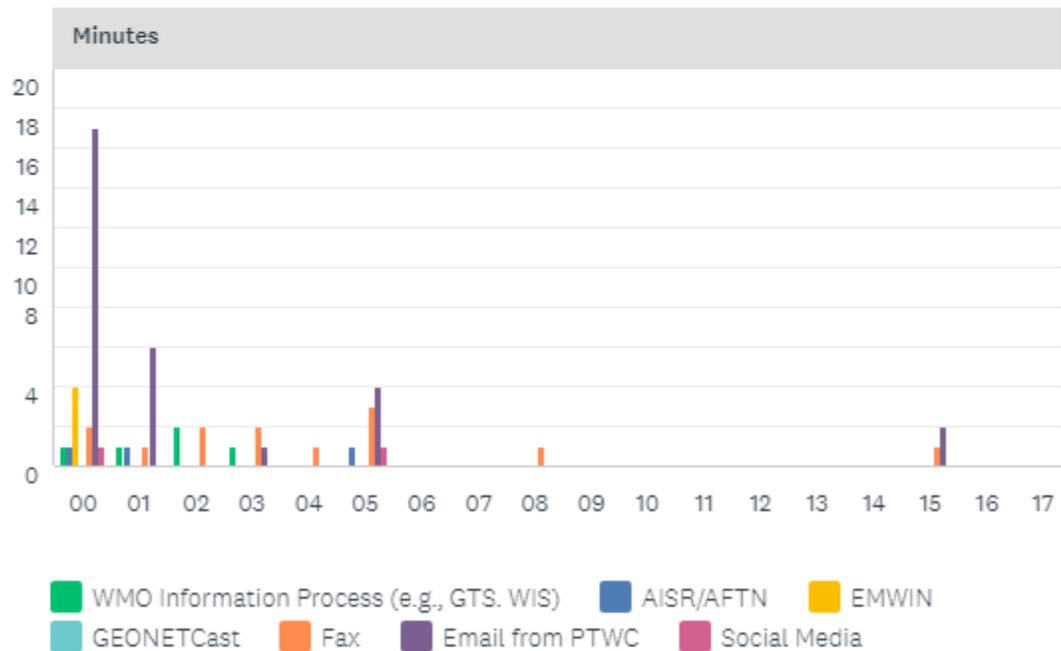
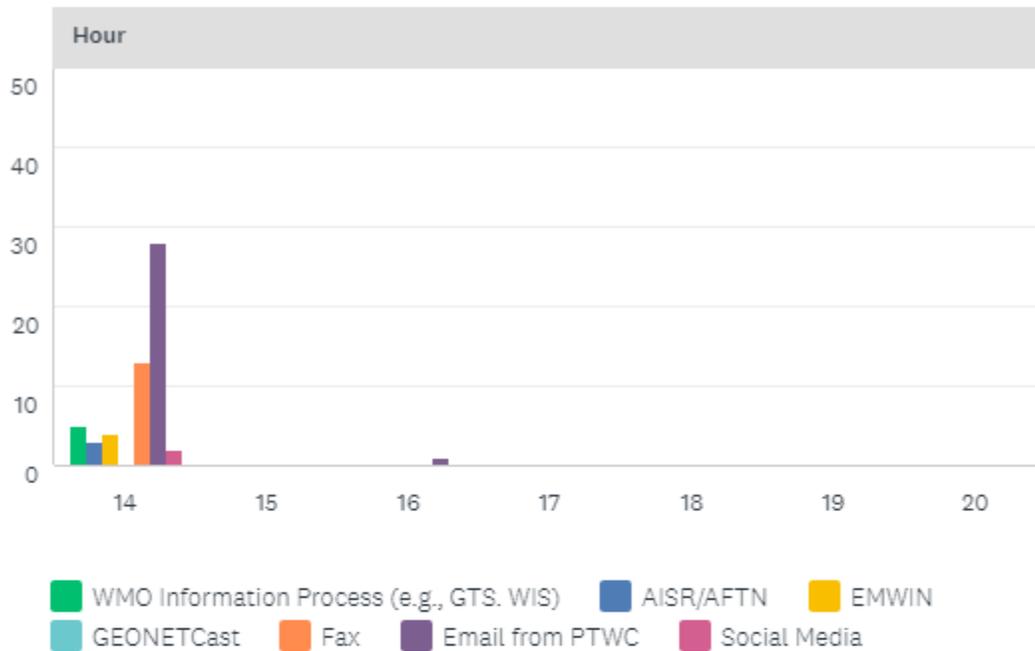
Honduras: Este medio es el que tenemos definido.

Sint Maarten: Fax machine was malfunctioning on our side.

USA- US Virgin Islands: Text Messages.

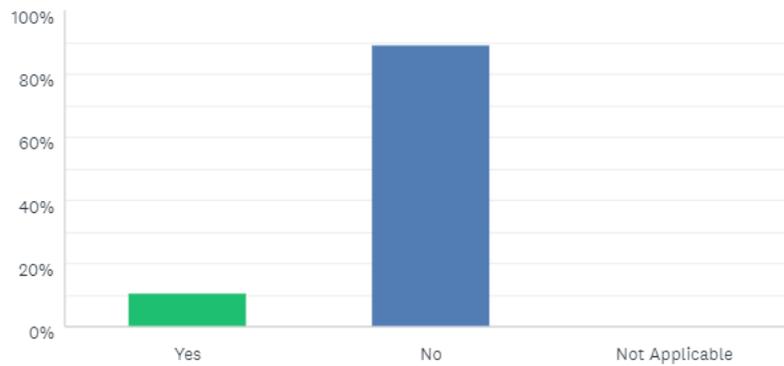
Q7 1B.3: The PTWC issued the CARIBE WAVE 18 initial Dummy Message by several methods. Please indicate the time at which the message was received by the TWFP/NTWC (UTC, Coordinated Universal Time).

Answered: 33 Skipped: 4



Q8 1B.4: Were there any problems with the receipt of PTWC CARIBE WAVE 18 initial Dummy (Start of Exercise) Message?

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
▼ Yes	10.81% 4
▼ No	89.19% 33
▼ Not Applicable	0.00% 0
TOTAL	37

Comments:

Belize: That was the only message that was recieved by fax, all other messages when to TWFP and Alternate mails and none went to the three participant.

Sint Maarten: Email came in without delay. Our fax machine jammed.

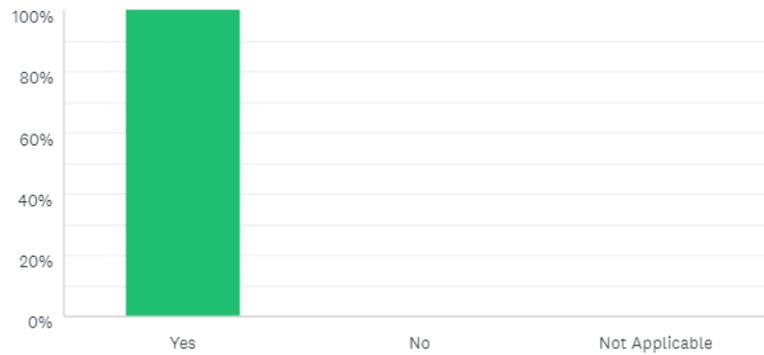
UK- Anguilla: The fax machine at the TWFP was out of ink, so no fax was received.

USA- Puerto Rico: No fax received.

USA- US Virgin Islands: Our ECC-911 Center on St. Thomas did not receive the fax but received a phone call.

Q9 1B.5: Did your TWFP/NTWC receive by email from PTWC the simulated exercise messages at the times specified in the Exercise Manual?

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	100.00% 37
No	0.00% 0
Not Applicable	0.00% 0
TOTAL	37

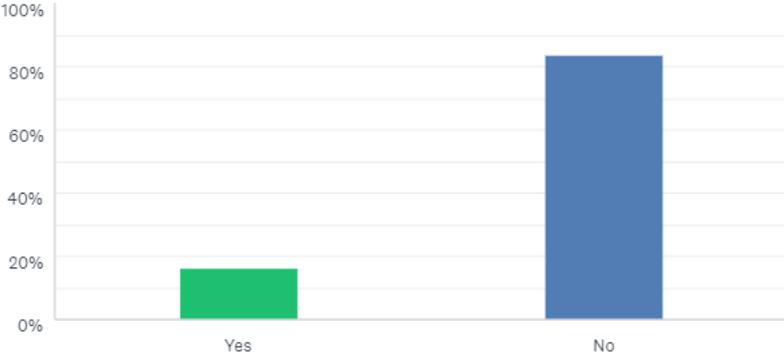
Comments:

Guatemala: First message was not received.

NL- Bonaire, Saba, Sint Eustatius: Simulated message with figures were received at 14:26 UTC.

Q10 1B.6: Did the Tsunami Warning Focal Point / National Tsunami Warning Center receive any message from an organisation other than the PTWC (e.g., Hydro/Met Office)? If yes, please use the comment box to indicate the agencies that received and communicated the products from PTWC during the exercise.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	16.22% 6
No	83.78% 31
TOTAL	37

Comments:

Dominican Republic: Puerto Rico Seismic Network by email.

Saint Vincent and the Grenadines: CDE MA.

UK- British Virgin Islands: PRSN.

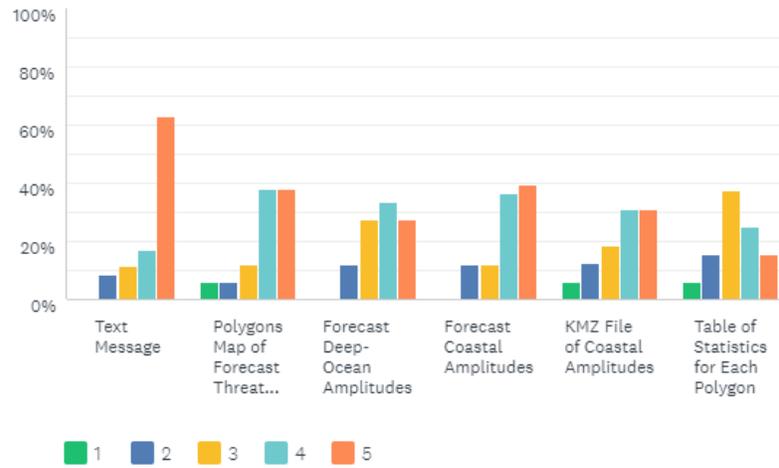
UK- Turks and Caicos Islands: Bahamas Met Office.

USA- Puerto Rico: PREMA received the PTWC products through PRSN.

Venezuela: Venezuelan Fondation for seismological Reseach.

Q11 2.1: Rate each product on its usefulness in decision making from 1 (less) to 5 (most)

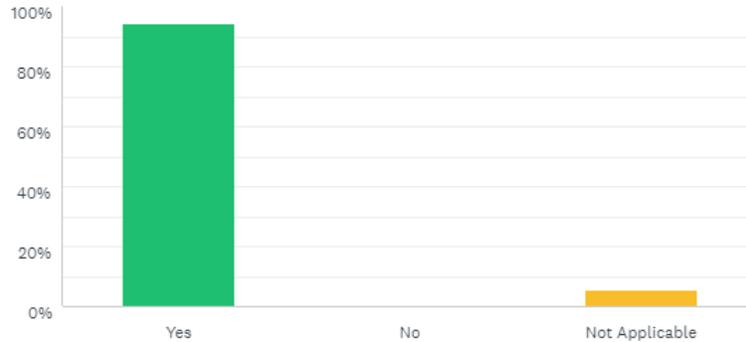
Answered: 36 Skipped: 1



	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
Text Message	0.00% 0	8.57% 3	11.43% 4	17.14% 6	62.86% 22	35	4.34
Polygons Map of Forecast Threat Levels	5.88% 2	5.88% 2	11.76% 4	38.24% 13	38.24% 13	34	3.97
Forecast Deep-Ocean Amplitudes	0.00% 0	12.12% 4	27.27% 9	33.33% 11	27.27% 9	33	3.76
Forecast Coastal Amplitudes	0.00% 0	12.12% 4	12.12% 4	36.36% 12	39.39% 13	33	4.03
KMZ File of Coastal Amplitudes	6.25% 2	12.50% 4	18.75% 6	31.25% 10	31.25% 10	32	3.69
Table of Statistics for Each Polygon	6.25% 2	15.63% 5	37.50% 12	25.00% 8	15.63% 5	32	3.28

Q12 2.2: The information provided in the PTWC exercise products assisted with decision making, e.g., tsunami threats, earthquake parameters, estimated arrival times, forecast wave heights, etc.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	94.59%	35
No	0.00%	0
Not Applicable	5.41%	2
TOTAL		37

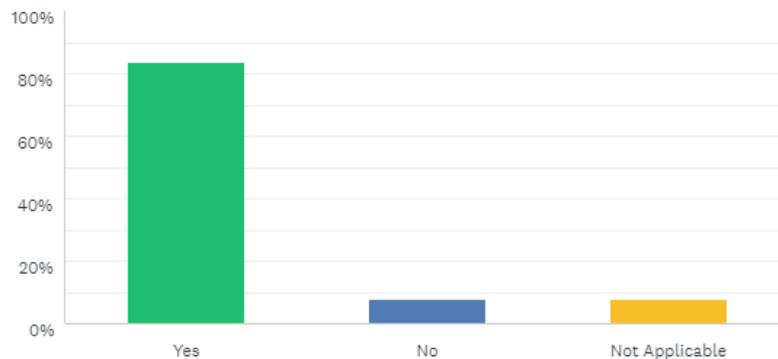
Comments:

Belize: TWFP received the message it was very useful. Only problem the 3 participant only received the first message.

USA- US Virgin Islands: The EOCs were not activated for the exercise.

Q13 2.3: Content: The forecast locations in the text messages are appropriate? If not, please suggest better locations.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	83.78% 31
No	8.11% 3
Not Applicable	8.11% 3
TOTAL	37

Comments:

Costa Rica: Cahuita, Barra del Colorado.

France: Forecast locations are OK, but naming and list sorting need to be improved.

Guyana: The location for Guyana is appropriate but not adequate. Because fo the form of the coastline, two additional points should be given. One to the east and west most points along the coastline.

Trinidad and Tobago: Yes but additional locations can be added such as Scarborough and Toco.

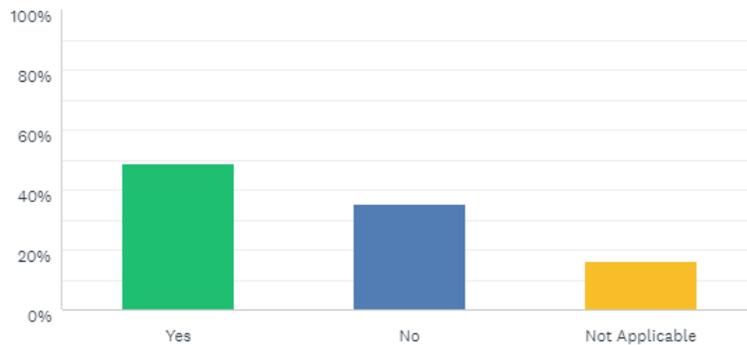
UK- Bermuda: Esso Pier was not a good location for this particular exercise, as it is located on the north side of the Island, and the tsunami would have impacted south shore first. Location is really highly dependant on direction Tsunami wave is coming from, in order to ascertain initial Island impact time.

USA- Puerto Rico: Penuelas Tide Gauge is not longer in function.

USA- US Virgin Islands: The EOCs were not activated fo rhte exercise.

Q14 2.4: Existing in-country event information/local (local seismic network, oceanographic instance, etc.) data were utilized to complement the PTWC exercise messages.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	48.65% 18
No	35.14% 13
Not Applicable	16.22% 6
TOTAL	37

Comments:

Belize: Using the Belize Tide Guages.

Brazil: There is a regional earthquake detection network.

Dominica: All seismic network were down due to hurricane.

Dominican Republic: If there is a national center for seismology, however, there was no involvement of its authorities.

Jamaica: Local seismic knowledge was used to complement the exercise and the discussions of the team.

France: We used shakemaps produced by the Volcanological and Seismological observatories of IPGP (OVSM-OVSG).

Trinidad and Tobago: Yes, in the form of local Tsunami Warning Advisories for the purpose of this exercise issued by the Tobago Emergency Management Agency.

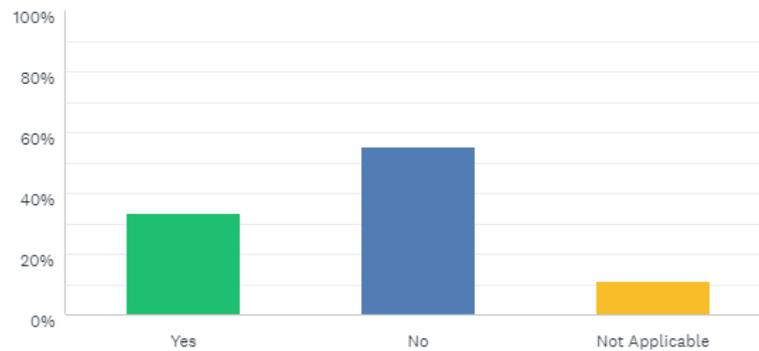
UK- Bermuda: Review of the Esso Pier NOAA tide gauge - sad to hear that this is to be decommissioned by NOAA in next year or so as it provides great data on many fronts.

USA- Puerto Rico: PRSN Products.

USA- US Virgin Islands: The EOCs were not activated for the exercise.

Q15 2.5: Additional in-country local/regional expert consultation was utilized for analyzing the PTWC exercise messages?

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	33.33% 12
No	55.56% 20
Not Applicable	11.11% 4
TOTAL	36

Comments:

France: Yes for Martinique, no for Guadeloupe and St Martin-St Barth.

Trinidad and Tobago: Answers to Sections One and Two to be answered by the TWFP/NTWC.

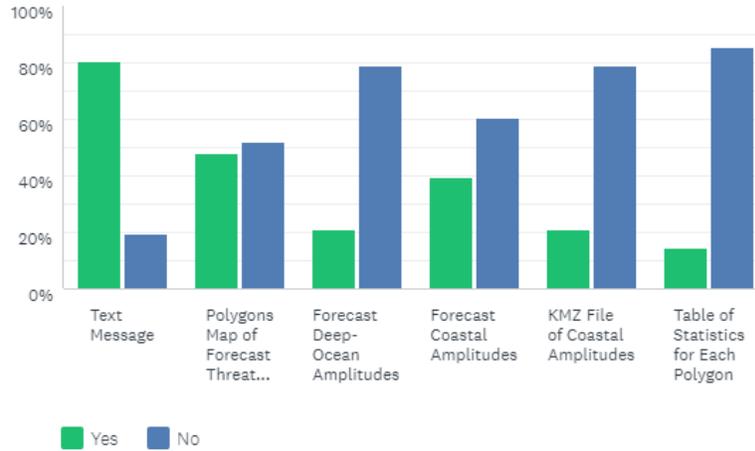
UK- Bermuda: Dr. Mark Guishard attended BWS for part of the exercise.

USA- Puerto Rico: Run PTWC Tide Tool locally and discuss results with staff.

USA- US Virgin Islands: The EOCs were not activated for the exercise.

Q16 2.6: Currently only the text messages are available to the public. Indicate which of the others PTWC products that are currently sent via email to only TWFP/NTWC should be made available to the general public (for example: through PTWC, web, media and etc.).

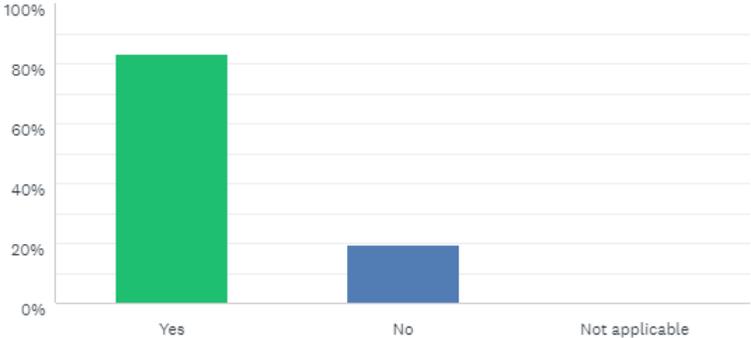
Answered: 33 Skipped: 4



	YES	NO	TOTAL RESPONDENTS
Text Message	80.65% 25	19.35% 6	31
Polygons Map of Forecast Threat Levels	48.00% 12	52.00% 13	25
Forecast Deep-Ocean Amplitudes	20.83% 5	79.17% 19	24
Forecast Coastal Amplitudes	39.29% 11	60.71% 17	28
KMZ File of Coastal Amplitudes	20.83% 5	79.17% 19	24
Table of Statistics for Each Polygon	14.29% 3	85.71% 18	21

Q17 2.7: Do you required additional training on PTWC products.

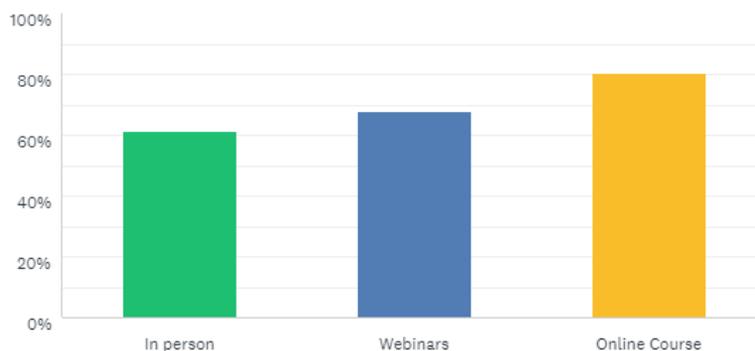
Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	83.33% 30
No	19.44% 7
Not applicable	0.00% 0
Total Respondents: 36	

Q18 2.8: What type of training?

Answered: 31 Skipped: 6



ANSWER CHOICES	RESPONSES
▼ In person	61.29% 19
▼ Webinars	67.74% 21
▼ Online Course	80.65% 25
Total Respondents: 31	

Comments:

Antigua & Barbuda: For Media personnel and Policy level.

Brazil: Or the subject, not Brazil, is fairly recent, and it has a low probability of occurrence of this type of phenomenon, it has been much more than ever attempted.

Cuba: Short course.

Honduras: Los productos generados por PTWC si estan disponibles al publico genera incertidumbre ya que lo interpretan de acuerdo a su capacidades e intereses , considero que la informacion debe de llegar a los puntos focales y luego del análisis socializarlo al publico bajo otros conceptos atendibles y de fácil ejecución.

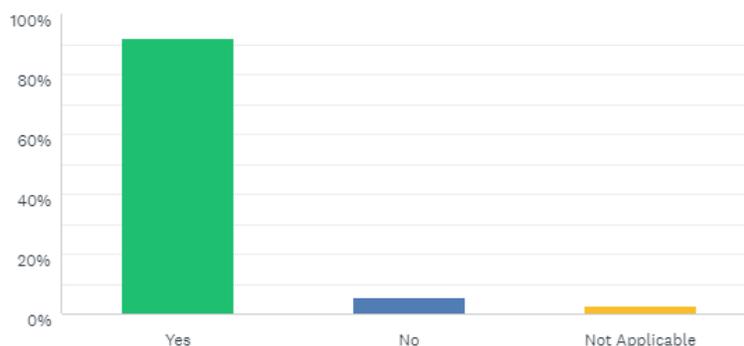
Jamaica: All of the above means are recommended. If there is a possibility for stakeholders in Jamaica to be trained together or sensitized together in a webinar to commence the training, then further online courses and in person could be added.

Trinidad and Tobago: Online course will be the most convenient of the three.

UK- Bermuda: BWS certainly welcome more webinars; e.g. ahead of next year's exercise.

Q19 3A.1: The TWFP/NTWC/NDMO has standard operating procedures in place for the receipt and dissemination of tsunami products.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	91.89% 34
No	5.41% 2
Not Applicable	2.70% 1
TOTAL	37

Comments:

Belize: Once recieved information is dessimated to NEMO.

Brazil: This was one of the points tested in the Simulation.

Dominican Republic: We have to update and socialize.

France: Yes for Martinique, under construction for Guadeloupe and St Martin-St Barth.

Guatemala: Ad hoc people that have participated in training discuss with Director and decide procedures.

Jamaica: Tsunami warning and Dissemination protocals exist.

Saint Vincent and the Grenadines: Draf.

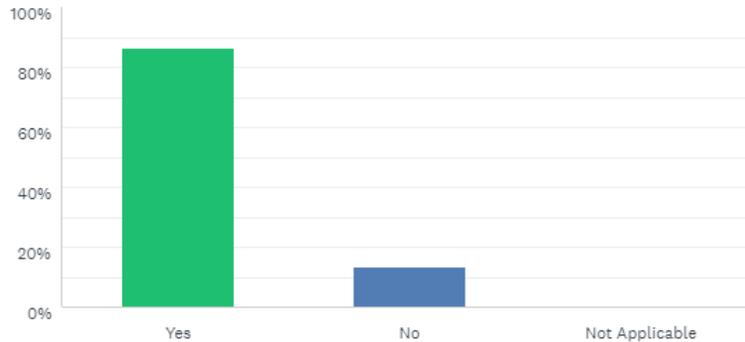
Sint Maarten: Is being worked on.

UK- Bermuda: Need to update our SOPs due to confusion between PTWC (CaribeWave) and NTWC (LANTEX). *Christa aware of this.

USA- Puerto Rico: PRSN/NWS-SJ as Alternate TWFP has standard operating procedures in place for the receipt and dissemination of tsunami products.

Q20 3A.2: The TWFP/NTWC/NDMO has undertaken activity to increase its capacity and capability to received and disseminate tsunami products (e.g. training, exercise, etc.). Note activities in Comments section.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	86.49% 32
No	13.51% 5
Not Applicable	0.00% 0
TOTAL	37

Comments:

Antigua & Barbuda: Training, exercises when decided. Education/Training of stakeholders (Education, Public, Private, civil society sector).

Belize: Education training to schools and different stakeholders.

Cuba: Trainings for the civil defense and risk groups of the most threatened localities and the working groups of our forecasting and warning centers.

Dominican Republic: The institutions involved have not generated prior to the exercise of activities related to it.

France: In each island, one week per year is dedicated to seismic hazard awareness and tsunami risk is included.

Grenada: Tsunami Ready Project implemented in St. Patrick.

Jamaica: No activities were undertaken to date.

Mexico: Training, at three exercises per year and results analysis.

NL- Bonaire, Saba, Sint Eustatius: We added automatically additional information to the original text messages for clarification.

Panama: Se realizaron reuniones, charlas.

Saint Kitts and Nevis: Extended the service to sister island real time Nevis.

Saint Lucia: In-house training of some staff and a faster and more reliable internet service provider.

Trinidad and Tobago: Training, exercises and education.

UK- Anguilla: New Officers at the TWFP are trained regularly, unfortunately some are not aware of the importance of their role despite receiving the training.

UK- Bermuda: Always training new staff in conjunction with our SOPs and the Tsunami COMET module.

UK- Cayman Islands: 911 Emergency Communications has now established an out of office hours, weekends and holidays call tree for tsunami threats and other major incidents. Additional Government Communicators can update websites and social media pages as Cayman's Disaster Management Office. Several Government communicators now have tsunami templates available on mobile phones, and have access to a mass email for local media representatives (approximately 90 persons) from a single address.

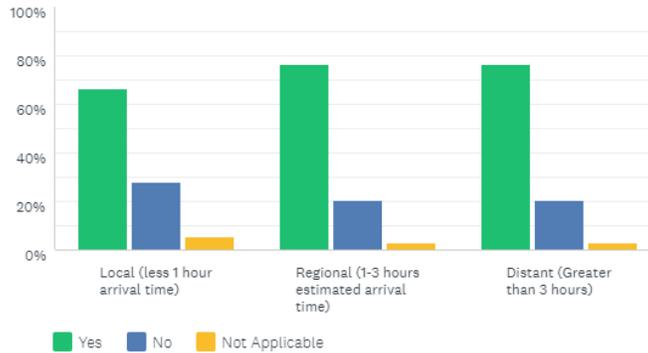
UK- Turks and Caicos Islands: e.g. Communication test conducted with Disaster Subcommittees and Response agencies, Emergency Contact list updated, Updating of Tsunami Response plan and SOP.

USA- Puerto Rico: PRSN as Alternate TWFP conducts Annual Exercise Program (Drills, Table Tops and Communications), Tsunami Media Kit Training, Emergency Managers Train the Trainers Program, TsunamiReady Operators Training; Regroup Mass notification system and HAM radio communications tested during CW2018.

USA- US Virgin Islands: Working to increase the number of personnel to be notified.

Q21 3B.1: A country tsunami emergency response plan for tele/regional/local tsunamis exists.

Answered: 36 Skipped: 1



	YES	NO	NOT APPLICABLE	TOTAL
Local (less 1 hour arrival time)	66.67% 24	27.78% 10	5.56% 2	36
Regional (1-3 hours estimated arrival time)	76.47% 26	20.59% 7	2.94% 1	34
Distant (Greater than 3 hours)	76.47% 26	20.59% 7	2.94% 1	34

Comments:

Brazil: Due to the low recurrence of events, there are no contingency plans for this type of disaster.

Dominican Republic: Yes we have procedure manual standart tsunami.

France: Tsunami emergency response plans exist for Martinique. They will be adapted to Guadeloupe and to St Martin-St Barthelemy soon.

Grenada: They are all in the draft stage.

Haiti: For 3 coastal cities only.

Jamaica: Jamaica only has in place a tsunami warning dissemination protocal developed.

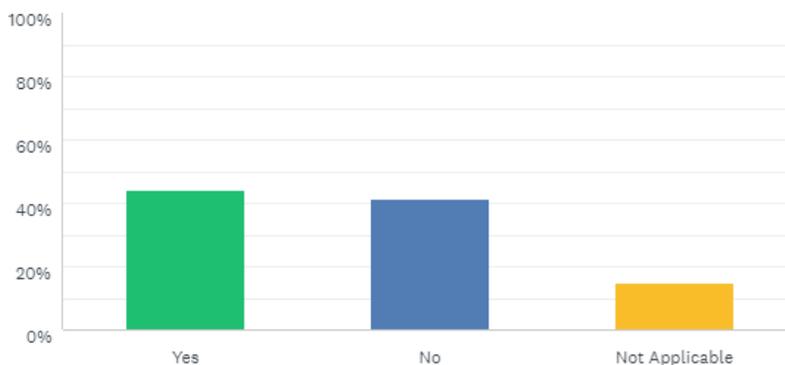
NL- Bonaire, Saba, Sint Eustatius: Should be developed by the islands.

UK- Bermuda: The EMO (Bermuda Government) currently have no organised plan, which is alarming. We participate in this exercise every year, but appear to make no strides forward. If anyone can help we would appreciate it!

USA- Puerto Rico: PREMA is TWFP for Puerto Rico; PRSN serves as source of information. See PREMA answers.

Q22 3B.2: The NDMO has a tsunami mass coastal evacuation plan.

Answered: 34 Skipped: 3



ANSWER CHOICES	RESPONSES
Yes	44.12% 15
No	41.18% 14
Not Applicable	14.71% 5
TOTAL	34

Comments:

Antigua & Barbuda: I believe they have.

Brazil: There is no federal plan, although states and municipalities have plans for other types of disasters.

Dominican Republic: If it exists, but it will depend on the response agency.

France: Tsunami mass coastal evacuation plans exist for Martinique. They will be adapted to Guadeloupe and to St Martin-St Barthelemy soon.

Guatemala: In Sipacate (coastal community - Pacific).

Haiti: For 3 coastal cities only.

Trinidad and Tobago: Under development.

UK- Bermuda: We (Bermuda Government/EMO) have an inundation map extending up to 30ft that highlights areas to evacuate but no procedures set up to go about doing this.

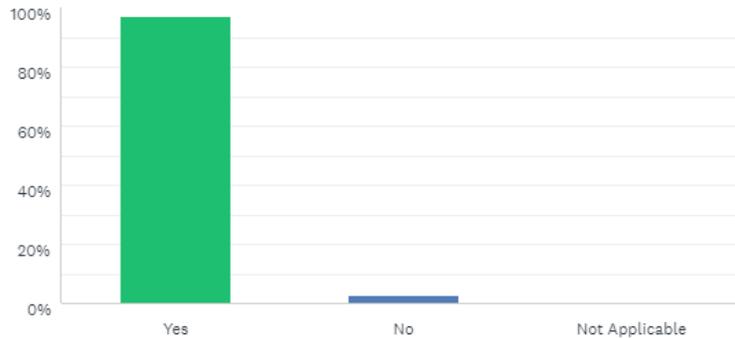
UK- Turks and Caicos Islands: Adraft national evacuation plan exist. Additionally, specific island evacuation plan has been draft for the island of Salt Cay. Other island plans are being drafted.

USA- Puerto Rico: The Municipal DMO is responsible for the local coastal evacuation plan. See PREMA answers.

Venezuela: Evacuation plan is in the construction phase.

Q23 3B.3: Arrangements exist to assemble the in-country disaster management group (Emergency Operations Center) relevant to decision- making on tsunami warning and response.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	97.30% 36
No	2.70% 1
Not Applicable	0.00% 0
TOTAL	37

Comments:

Brazil: Regardless of the type of disaster, the partner agencies can be activated.

Guatemala: But for response, not alerting.

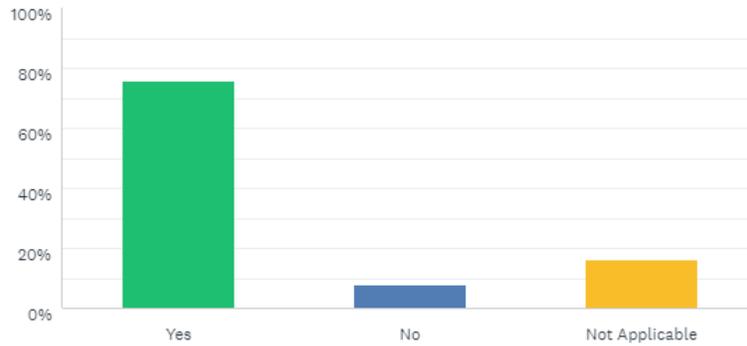
NL- Bonaire, Saba, Sint Eustatius: Partly, should be (and will be) further developed.

UK- Bermuda: There is a loose arrangement for this, but procedures beyond this is not well established (see previous comments).

USA- Puerto Rico: PREMA is TWFP for Puerto Rico; PRSN serves as source of information. See PREMA answers.

Q24 3B.4: The response plan includes processes to issue Safe-to-Return (All-Clear) notices.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	75.68% 28
No	8.11% 3
Not Applicable	16.22% 6
TOTAL	37

Comments:

Guatemala: CONRED is responsible for this.

Haiti: For 3 coastal cities only.

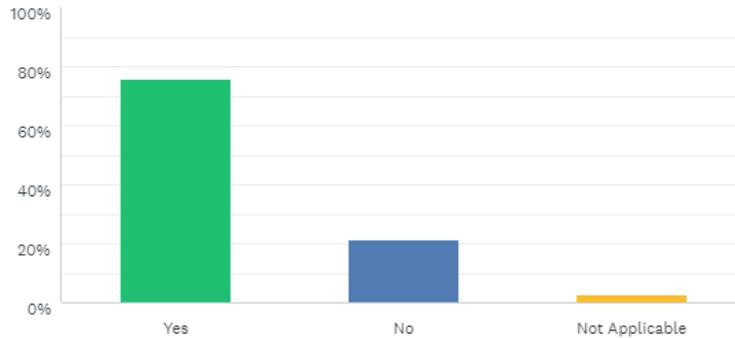
Jamaica: No response plan developed.

UK- Bermuda: No formal response plan!

USA- Puerto Rico: See PREMA answers.

Q25 3B.5: Public education materials have been developed and/or disseminated.

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES	
▼ Yes	75.68%	28
▼ No	21.62%	8
▼ Not Applicable	2.70%	1
TOTAL		37

Comments:

Antigua & Barbuda: Responsibility of the TNC.

Cuba: Trainings to teachers and students of schools in coastal areas mainly.

Dominican Republic: Regarding the exercise, no distribution of teaching material was made.

Jamaica: Public education material developed through a CDEMA project initiative.

NL- Bonaire, Saba, Sint Eustatius: Not yet, is planned.

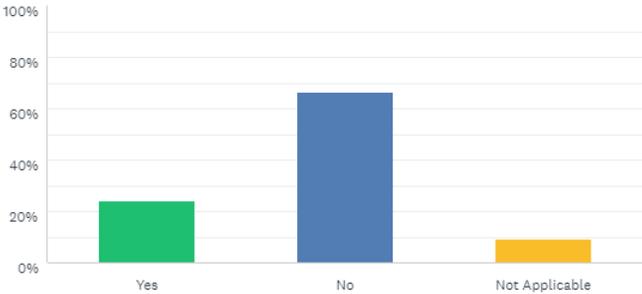
UK- Bermuda: Not really - just the Press Release. Apparently some schools have covered the tsunami topic, but I do not believe this is part of their formal curriculum.

UK- Cayman Islands: On website and also physical copies for distribution. Tsunami Awareness Presentations offered to Schools, Businesses and Government Agencies. Displays at public events etc.

USA- Puerto Rico: PRSN Outreach and Education division has developed products. More and continuous education needed.

Q26 3B.6: Tsunami-related curriculum programmes are in place for different levels of education. Note which levels in Comments section.

Answered: 33 Skipped: 4



ANSWER CHOICES	RESPONSES
Yes	24,24% 8
No	66,67% 22
Not Applicable	9,09% 3
TOTAL	33

Comments:

Antigua & Barbuda: Adhoc material resources by teachers interaction with NDMO.

Dominican Republic: We have manuals for the basic and medium level school curriculum. but they have not been implemented yet.

France: Tsunami curriculum programmes exist at elementary and secondary school level.

Haiti: In progress.

Nicaragua: We have master degree program on tsumai disaster mitigation with the aid of JICA, Japan to personnel of INETER.

Trinidad and Tobago: Under development.

UK- Anguilla: Tsunami-related information is now included in all public awareness and information dissemination of the NDMO. Although there is no specific curriculum programme.

UK- Bermuda: As comment above.

UK- Cayman Islands: Not officially included in curriculum but annual hazard awareness presentations (which include info about tsunami) are established in Government Schools.

UK- Montserrat: Signage, pamphlets.

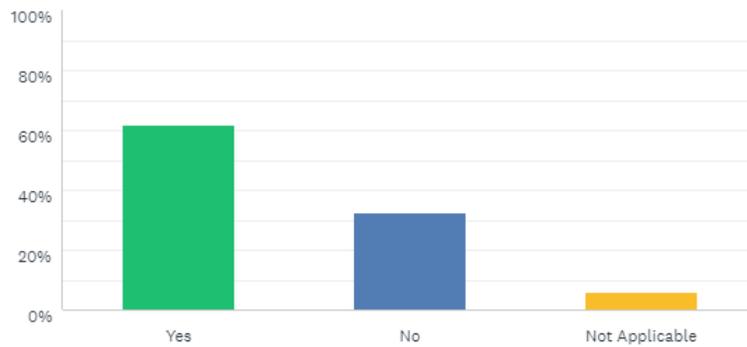
UK- Turks and Caicos Islands: Disaster-related curriculum programmes have been been implemented at primary, secondary and tertiary levels.

USA- Puerto Rico: PRSN K-6th grade and 7th-12th grade tsunami curriculum.

USA- US Virgin Islands: School age and adult.

Q27 3B.7: Are there other preparedness/education tools and products utilised in your country/territory? Please list in comments section.

Answered: 34 Skipped: 3



ANSWER CHOICES	RESPONSES
Yes	61.76% 21
No	32.35% 11
Not Applicable	5.88% 2
TOTAL	34

Comments:

Antigua & Barbuda: Responsibility of the TNC.

Aruba: Geografic maps was distributed illustrating the evacuation zon'e.

Bahamas: Media, radio, community meetings, school safety program, and television ads.

Belize: Tsunami exercise drills in case of Dam breake.

Colombia: Talleres de sensibilización y preparación con actores locales coordinados por el NDMO.

Cuba: They are in the preparation phase.

Dominican Republic: The law of 147-02 of risk management empowers us as a prevention institution, we offer educational institutions and other areas, both public and private talks, conferences among others. We serve the Risk Management School of the Country.

Grenada: School Presentation, erection of Tsunami warning signs.

Haiti: Exposition.

Jamaica: One high school developed a tsunami poster. ODPEM in collaboration with a high school developed a tsunami poster dor the school community.

Mexico: Brochures, infographics and videos.

Nicaragua: Brochures, trainings.

NL- Bonaire, Saba, Sint Eustatius: We developed a video with explanation for the government.

Trinidad and Tobago: Radio and Television interviews, Leaflets and Brochures.

UK- Anguilla: The Annual All Hazards Risk Reduction Fair and 4-yearly Library Summer Camp for children 5-12 held by the NDMO. Quarterly hazards focus on radio and social media.

UK- Bermuda: Nothing beyond Press Release and some social media posts.

UK- British Virgin Islands: Videos, school talks and town meetings.

UK- Cayman Islands: Social Media memes.

UK- Montserrat: web page/ Facebook page.

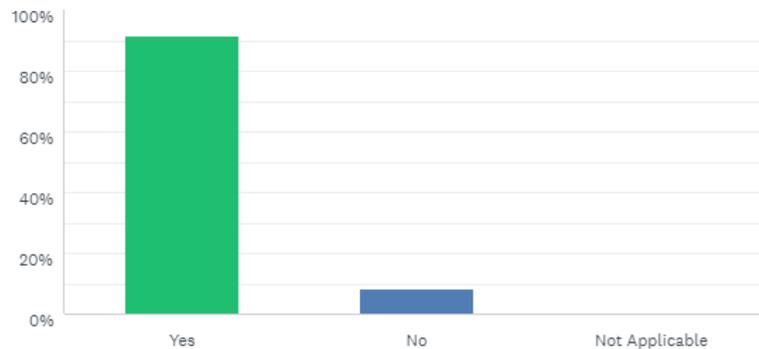
USA- Puerto Rico: Train the Trainers, TsunamiReady Operators training, Tsunami Media kit, Coastal Community and Port Operators training.

USA- US Virgin Islands: Tsunami Evacuation Plans, PSAs in English & Spanish, & Informational brochures & pamphlets.

Venezuela: Educational games, educational videos, simulators, message in public places, brochures.

Q28 3C.1: The response activation process was followed when the Dummy message from PTWC for CARIBE WAVE 18 exercise was received.

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	91.67% 33
No	8.33% 3
Not Applicable	0.00% 0
TOTAL	36

Comments:

Belize: The message was only received by TWFP and Alternate, who were both out of the country and not to 3 participants from the NMS.

Dominican Republic: Yes, The National Office of Meteorology as focal point, did the whole process of activation in our manual of procedure before the tsunami, however, the emergency operations center received the bulletins that we issued in the onamet, but did not broadcast it to the others instance that establishes the protocolo that they possess.

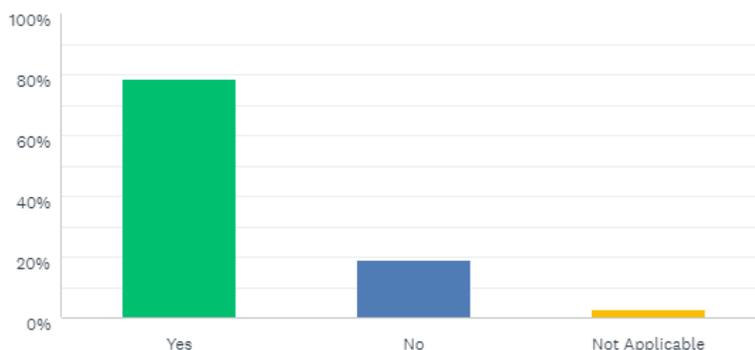
Sint Maarten: We conducted a table top exercise based on the Barbados scenario. We did not follow the timeline.

UK- Anguilla: Yes the NEOC members were notified but due the size of the event not activated.

USA- US Virgin Islands: Our sirens were not tested or activated since they are all not operable.

Q29 3C.2: Did the TWFP/NTWC issue the messages for CARIBE WAVE

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	78.38% 29
No	18.92% 7
Not Applicable	2.70% 1
TOTAL	37

Comments:

Antigua & Barbuda: The NDMO engaged the call out agencies in providing evaluators for the exercise.

Dominican Republic: We performed all the procedures established in our manual of tsunami warning.

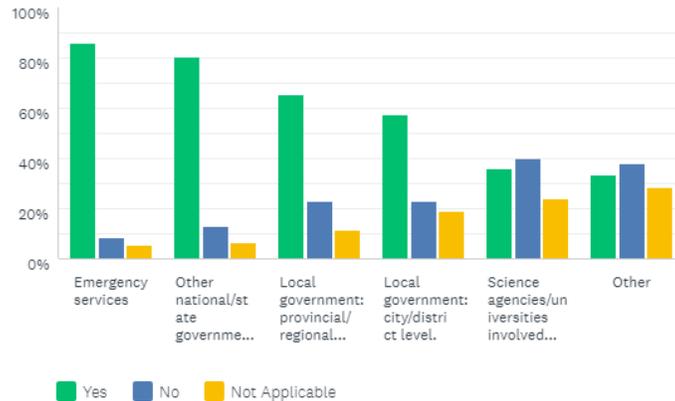
UK- Anguilla: The NDMO issued the messages.

UK- Cayman Islands: Public notification was conducted by the HMCI and the Joint Communications Structure which is a sub committee of the National Emergency Operations Centre.

USA- Puerto Rico: PRSN, as Alternate TWFP, issued all bulletins accordingly.

Q30 3C.3: CARIBE WAVE 18 messages were issued to:

Answered: 37 Skipped: 0



	YES	NO	NOT APPLICABLE	TOTAL
Emergency services	86.11% 31	8.33% 3	5.56% 2	36
Other national/state government agencies	80.65% 25	12.90% 4	6.45% 2	31
Local government: provincial/regional level	65.38% 17	23.08% 6	11.54% 3	26
Local government: city/district level	57.69% 15	23.08% 6	19.23% 5	26
Science agencies/universities involved in assessment	36.00% 9	40.00% 10	24.00% 6	25
Other	33.33% 7	38.10% 8	28.57% 6	21

Comments:

Belize: The NMS have nominated 3 persons do participate , but they didnot recieved the messages.

Dominican Republic: Our procedure manual establishes that the TWFP will only issue tsunami bulletins to NDMO, which should alert the population and other entities of the state.

France: Others are the media.

Jamaica: Meteorological Service of Jamaica, Jamaica Constabulary Force, Earthquake Unit, Office of Disaster Preparedness and Emergency Management.

Saint Vincent and the Grenadines: public.

Sint Maarten: We had incorporated the messages into the tabletop scenario.

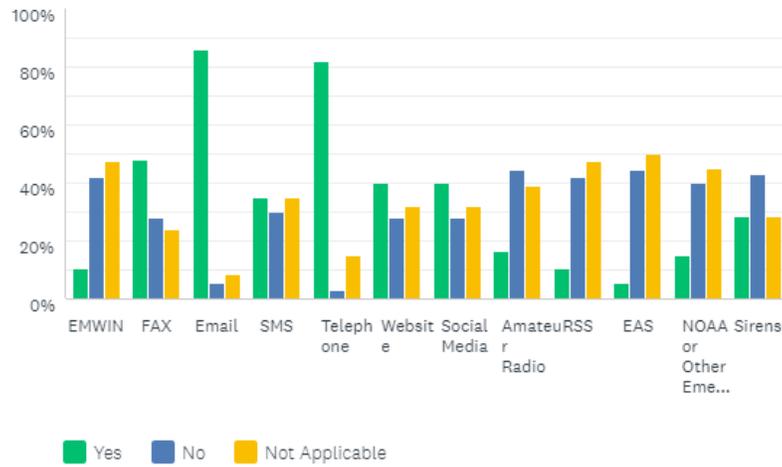
Trinidad and Tobago: In house TTX only. Initial contact established with all above but none exercised.

UK- Bermuda: Messages meant Bermuda Weather Service issued a Tsunami Warning, which was communicated to the both Government/EMO and the Public. Usual weather service methods were used - website, cable TV channels, phone tapes.

USA- US Virgin Islands: EOCs were not activated for the exercise.

Q31 3C.4: What methods were used by the TWFP/NTWC/NDMO to disseminate the CARIBE WAVE 18 messages?

Answered: 37 Skipped: 0



	YES	NO	NOT APPLICABLE	TOTAL
EMWIN	10.53% 2	42.11% 8	47.37% 9	19
FAX	48.00% 12	28.00% 7	24.00% 6	25
Email	86.11% 31	5.56% 2	8.33% 3	36
SMS	35.00% 7	30.00% 6	35.00% 7	20
Telephone	81.82% 27	3.03% 1	15.15% 5	33
Website	40.00% 10	28.00% 7	32.00% 8	25
Social Media	40.00% 10	28.00% 7	32.00% 8	25
Amateur Radio	16.67% 3	44.44% 8	38.89% 7	18
RSS	10.53% 2	42.11% 8	47.37% 9	19
EAS	5.56% 1	44.44% 8	50.00% 9	18
NOAA or Other Emergency Alert Radio	15.00% 3	40.00% 8	45.00% 9	20
Sirens	28.57% 6	42.86% 9	28.57% 6	21

Comments:

Aruba: All official car's with sirens used sirens after receiving the message.

Guatemala: HF Radio.

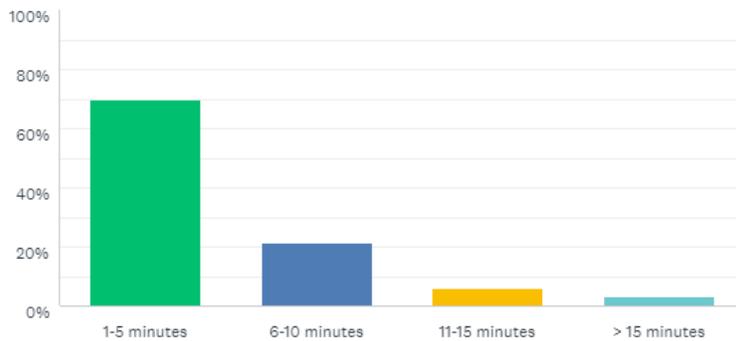
Saint Vincent and the Grenadines: CAP.

UK- Turks and Caicos Islands: Whatsapp.

USA- Puerto Rico: EAS, NOAA radio activation by NWS-SJ; Siren activation by Municipal DMO; SMS, telephone, email communications tested with Regroup mass notification service from PRSN.

Q32 3C.5: How soon after start of exercise were the CARIBE WAVE 18 exercise messages sent from TWFP/NTWC to the corresponding agency or agencies (listed before)?

Answered: 33 Skipped: 4



ANSWER CHOICES	RESPONSES
1-5 minutes	69.70% 23
6-10 minutes	21.21% 7
11-15 minutes	6.06% 2
> 15 minutes	3.03% 1
TOTAL	33

Comments:

Antigua & Barbuda: NA - corresponding agencies were involved as evaluators.

Belize: The nominees dd not received the messages.

Colombia: No aplica.

Jamaica: Jamaica participated in a table top exercise letters were read to the group on receipt.

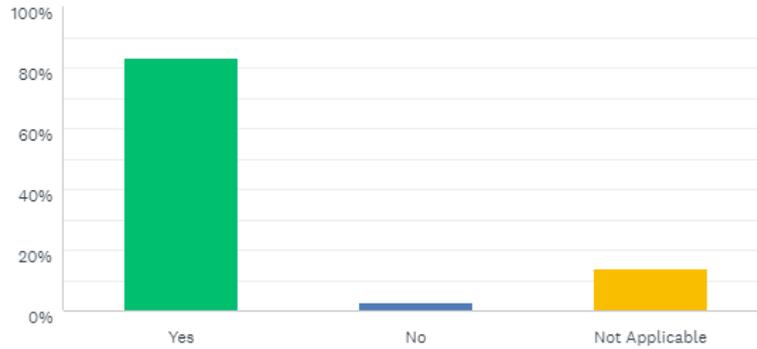
Trinidad and Tobago: In house TTX only. Initial contact established but none exercised.

USA- Puerto Rico: PRSN issued as Alternate TWFP.

USA- US Virgin Islands: Not applicable.

Q33 3C.6: Based on feedback from agencies were the communication methods timely and appropriate?

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	83.33% 30
No	2.78% 1
Not Applicable	13.89% 5
TOTAL	36

Comments:

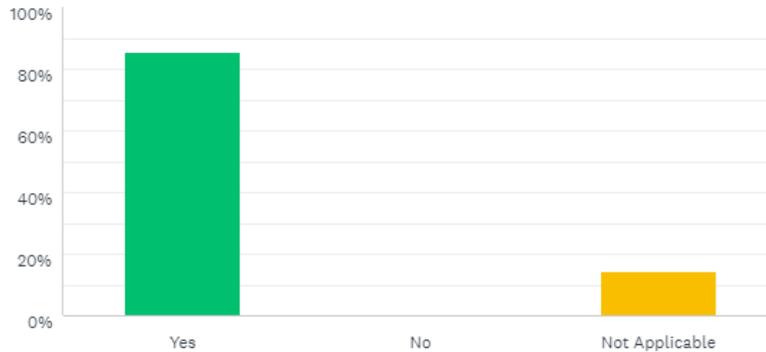
Trinidad and Tobago: No external agencies engaged.

UK- Turks and Caicos Islands: While communications would have gone out in a timely manner, there were delays in receiving feedback from a number of stakeholders.

UK- Bermuda: There was a question as to whether they should have been alerted when BWS received message #1, despite Bermuda not listed in the Threat messaging.

Q34 3C.7: Based on feedback from agencies was the message(s) disseminated from TWFP/NTWC/NDMO accurate and clear?

Answered: 35 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	85.71% 30
No	0.00% 0
Not Applicable	14.29% 5
TOTAL	35

Comments:

Dominican Republic: The messages of TWFP were precise and clear towards the NDMO, however, the NDMO did not spread to the other institutions established in its protocol.

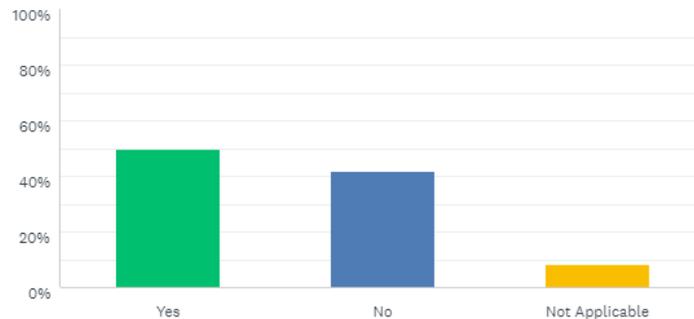
Trinidad and Tobago: In house TTX only.

UK- Bermuda: BWS has a local warning issue with local time (12hr clock) and the 24hr clock, but this was corrected.

USA- Puerto Rico: See PREMA answers for their message dissemination feedback.

Q35 3C.8: Was your Country's/Territory's Emergency Operations Center activated during the exercise?

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	50.00% 18
No	41.67% 15
Not Applicable	8.33% 3
TOTAL	36

Comments:

Antigua & Barbuda: Limited activation.

Costa Rica: But to a local level.

Honduras: Se activo el Sistema de Alerta Temprana y se asumió la activación de Comites de Emergencia Local.

Jamaica: Jamaica participated is a table top discussion exercise.

Nicaragua: The exercise was at table level.

Saint Vincent and the Grenadines: partial activation.

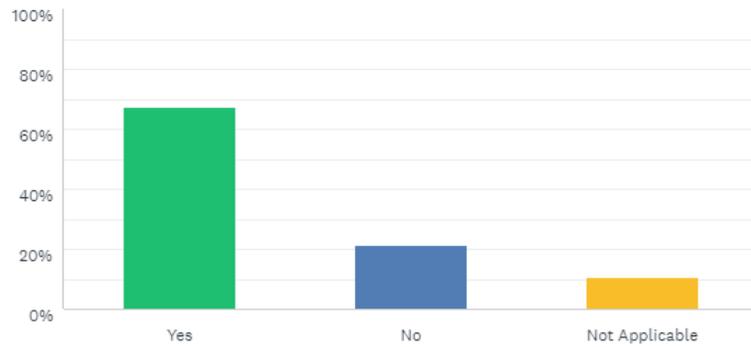
Trinidad and Tobago: In house TTX only.

UK- Bermuda: No, although the National Disaster Coordinator (EMO) did attend BWS for the duration of the exercise.

USA- Puerto Rico: Some state and municipal EOC's may have been already activated in response to Hurricane Maria. These EOC's and radio operators from 76 municipalities participated in PRSN communications test.

Q36 3D.1: Did the National Disaster Management Organisation (or equivalent) maintain communication with the TWFP/NTWC throughout the event?

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES
Yes	67.57% 25
No	21.62% 8
Not Applicable	10.81% 4
TOTAL	37

Comments:

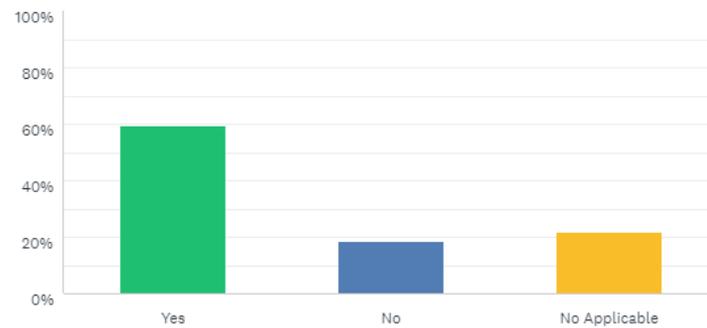
Sint Maarten: TWFP and NDMO are located in the same building.

UK- Bermuda: As the National Disaster Coordinator was in attendance at the exercise, this was easy.

USA- Puerto Rico: See PREMA answers.

Q37 3D.2: Did the National Disaster Management Organisation (or equivalent) maintain communication with local/regional disaster management organisations (or equivalent)?

Answered: 32 Skipped: 5



ANSWER CHOICES	RESPONSES
Yes	59.38% 19
No	18.75% 6
No Applicable	21.88% 7
TOTAL	32

Comments:

Antigua & Barbuda: Responsibility of the TNC.

Jamaica: Communcation contact was made with countries in the sub regional network.

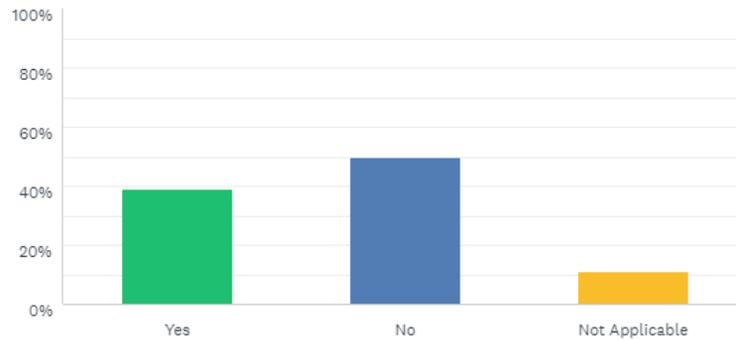
NL- Bonaire, Saba, Sint Eustatius: Communication went through TWFP

UK- Bermuda: National is local for such a small country as Bermuda.

USA- Puerto Rico: See PREMA answers.

Q38 3D.3: Were any areas evacuated as part of the CARIBE WAVE 18 Exercise?

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES	
▼ Yes	38.89%	14
▼ No	50.00%	18
▼ Not Applicable	11.11%	4
TOTAL		36

Comments:

Antigua & Barbuda: Preschools within the tsunami impact zones island-wide.

Cuba: Evacuation training was done in coastal locations.

Dominican Republic: Only was a communication exercise.

Honduras: Se asumió virtualmente evacuaciones.

France: Buildings and schools were avacuated.

Trinidad and Tobago: In house TTX only.

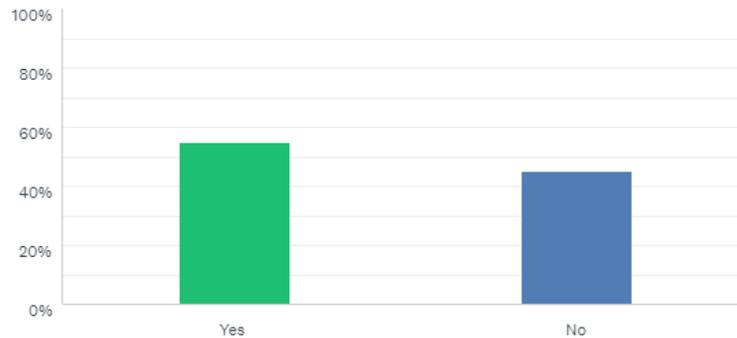
UK- Anguilla: 50 members of staff from the Four Seasons Resort evacuated to the Tsunami Assembly Point for the area.

USA- Puerto Rico: PRSN conducted "Camina tu ruta de desalojo con CW2018" in various coastal communities in the Mayaguez region.

USA- US Virgin Islands: Schools, hotels and agencies.

Q39 3D.4: Are tsunami evacuation maps available for your Country/Territory?

Answered: 31 Skipped: 6



ANSWER CHOICES	RESPONSES	
Yes	54.84%	17
No	45.16%	14
TOTAL		31

Comments:

Antigua & Barbuda: Responsibility of the TNC.

Aruba: Evacuation zone(2 km from the coastline).

Belize: I am not sure need to confirm with NEMO.

Costa Rica: Only for the Pacific coast.

Cuba: Baracoa city.

Dominican Republic: We have like 3 regions maps, but no for all the contry.

France: Interactive web site were anyone can find its own evacuation pathway.

Guatemala: Sipacate (Pacific).

Haiti: For 3 coastal cities.

Honduras: Tsunami Ready Cedeño , Marcovia , Choluteca zona sur de Honduras y Omoa en Puerto Cortes norte de Honduras.

Jamaica: Tsunami maps were developed for one community through project initiative.

Saint Vincent and the Grenadines: some available.

UK- Bermuda: As mentioned, a crude 10m/30ft inundation map provides some guidance on this.

USA- Puerto Rico: Visit <http://prddst.uprm.edu/apps/prtmp/>

Q40 3D.5: Are tsunami inundation maps available for your Country/Territory?

Answered: 31 Skipped: 6



	YES	NO	TOTAL
Local Scenario	64.52% 20	35.48% 11	31
Regional Scenario	55.56% 15	44.44% 12	27
Distant Scenario	48.15% 13	51.85% 14	27

Comments:

Antigua & Barbuda: Responsibility of the TNC.

Belize: I am not sure need to confirm with NEMO.

Colombia: Para algunas poblaciones principalmente en el Pacifico Colombiano.

Dominican Republic: Only existing local and regional scenario but only for 3 areas.

Guatemala: Sipacate (Pacific).

Honduras: Tsunami Ready Cedeño , Marcovia , Choluteca zona sur de Honduras y Omoa en Puerto Cortes norte de Honduras.

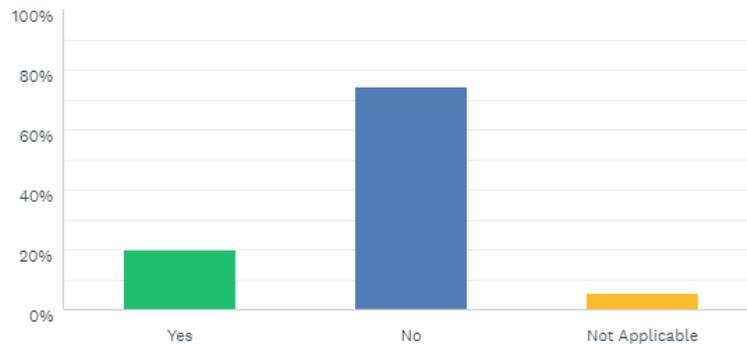
UK- Anguilla: The Tsunami map is based on a 100 ft wave impacting Anguilla and is widely used because the island is so narrow.

UK- Bermuda: Yes, but map only caters for a 10m/30ft inundation. It is meant to be all encapsulating for any scenario.

USA- US Virgin Islands: The territory has one inundation map per island.

Q41 3D.6: Did your Tsunami Warning Focal Point run any tsunami numerical models during the exercise (e.g., deep-ocean propagation and/or coastal inundation models)?

Answered: 35 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	20.00% 7
No	74.29% 26
Not Applicable	5.71% 2
TOTAL	35

Comments:

Antigua & Barbuda: Bathymetric data availability is an issue.

Dominican Republic: Tide Tool travel time.

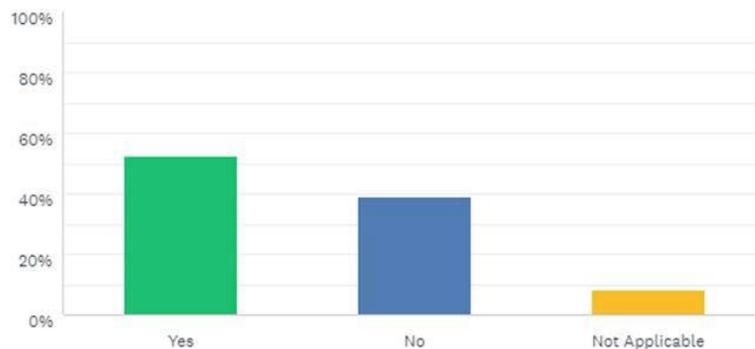
Guatemala: ComMIT.

UK- Turks and Caicos Islands: TWFP does not have the capability to carry out this.

USA- Puerto Rico: PTWC Tide tool in PRSN.

Q43 3E.1 Was a tsunami warning and/or information issued to the public as part of the CARIBE WAVE 18 Exercise?

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	52.78% 19
No	38.89% 14
Not Applicable	8.33% 3
TOTAL	36

Comments:

Barbados: A school was evacuated as part of the exercise.

Brazil: The procedures tested were only internal.

Cuba: Only in the localities where evacuation training was carried out.

Dominican Republic: This information was the responsibility of the NDMO.

Honduras: Seria informacion que pudiera generar algun tipo de incertidumbre por lo general lo hacemos a lo interno.

UK- Anguilla: Via the CAPiT EWS App.

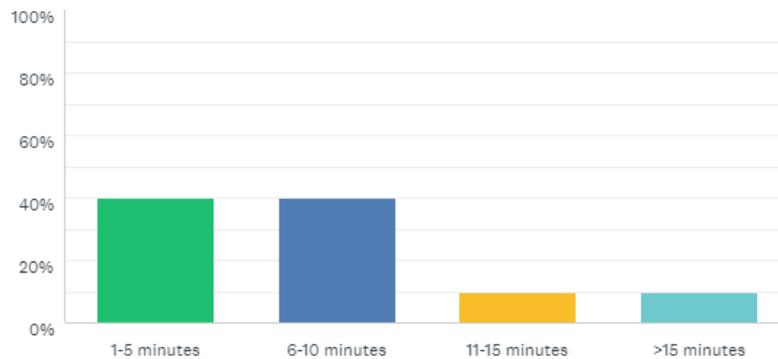
UK- Bermuda: Upon receipt of message #2 and threat of tsunami wave to Bermuda, a Tsunami Warning was issued.

UK- Turks and Caicos Islands: Not applicable for the type of exercise conducted.

USA- Puerto Rico: EAS activation, social media and web page posts, public email mailing lists, functional siren activation, Dummy live pill through the NOAA radio.

Q44 3E.2: Based on feedback, was the tsunami warning and/or information issued in a timely manner to the public (for example, prior to the scenario wave arrival time)?

Answered: 20 Skipped: 17



ANSWER CHOICES	RESPONSES
▼ 1-5 minutes	40.00% 8
▼ 6-10 minutes	40.00% 8
▼ 11-15 minutes	10.00% 2
▼ >15 minutes	10.00% 2
TOTAL	20

Comments:

Antigua and Barbuda: NA

Belize: The three participants did not received the messages.

Colombia: No aplica.

Curacao: Not send.

Dominican Republic: No apply.This information was the responsibility of the NDMO.

Jamaica: N/A

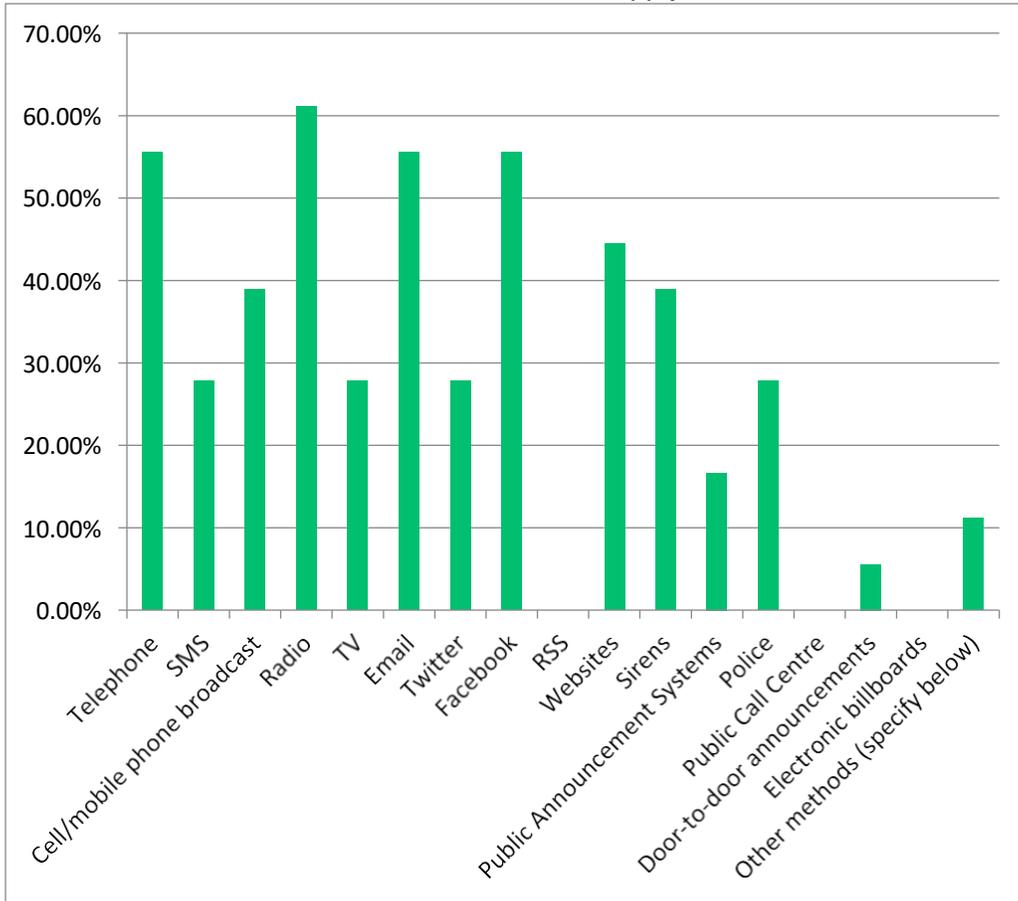
Honduras: A lo interno de COPECO.

Nicaragua: Not Applicable. The excersice was at table level.

Trinidad and Tobago: In house TTX only. No external feedback.

USA- US Virgin Islands: Not applicable. Warnings were not issued.

Q45 3E.3:How was the warning/information communicated to the public?
Please check all that apply:



ANSWER CHOICES	RESPONSES	
▼ Telephone	55.56%	10
▼ SMS	27.78%	5
▼ Cell/mobile phone broadcast	38.89%	7
▼ Radio	61.11%	11
▼ TV	27.78%	5
▼ Email	55.56%	10
▼ Twitter	27.78%	5
▼ Facebook	55.56%	10
▼ RSS	0.00%	0
▼ Websites	44.44%	8
▼ Sirens	38.89%	7
▼ Public Announcement Systems	16.67%	3
▼ Police	27.78%	5
▼ Public Call Centre	0.00%	0
▼ Door-to-door announcements	5.56%	1
▼ Electronic billboards	0.00%	0
▼ Other methods (specify below)	11.11%	2
Total Respondents: 18		

Comments:

Antigua & Barbuda: Responsibility of the TNC.

Belize: NONE

Colombia: No Aplica.

Curacao: Not send to public.

Dominican Republic: No apply. This information was the responsibility of the NDMO.

Jamaica: N/A

Nicaragua: Not Applicable. The exercise was at table level.

Saint Vincent and the Grenadines: CAP

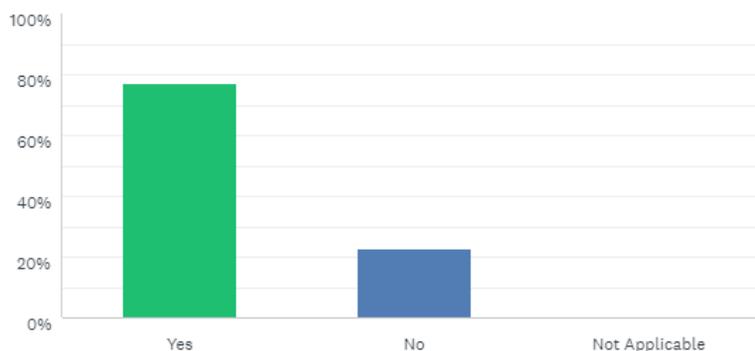
UK- Anguilla: Via The Anguilla Warning System and CAPiT Smartphone App.

USA- Puerto Rico: EAS activation/NOAA Radio.

USA- US Virgin Islands: Not applicable. Warning were not issued.

Q46 3E.4: In addition to the TWFP/NDMO, did other government and private sector groups participate? If yes, please list in comments section.

Answered: 35 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	77.14% 27
No	22.86% 8
Not Applicable	0.00% 0
TOTAL	35

Comments:

Antigua and Barbuda: Evaluators came for Government and Civil Society organisations (NGO) and volunteers.

Aruba: Hotels have participating in functional exercise by evacuating vertical. (See pictures at facebook Bureau Rampenbestrijding Aruba).

Brazil: Only the Government (federal agencies working on response actions).

Costa Rica: Local tourism business groups, childhood care.

Cuba: Local risk assessment groups.

France: Seismic and tide gauge network operators, rectory, some police stations and fire stations, network societies, local councils.

Grenada: Schools; the School for Children with Physical disability and Schools with children ages 3 – 5.

Guatemala: CONRED.

Haiti: AGERCA.

Jamaica: Earthquake Unit, Jamaica Constabulary Force.

Mexico: Police, Firefighters, Red Cross, Harbor Master, Electric Power Company.

NL- Bonaire, Saba, Sint Eustatius: Only government.

Panama: Club de Leones, Cruz Roja.

Saint Kitts and Nevis: Chamber of Industry and Commerce.

Sint Maarten: The recently established national tsunami working group participated in the exercise.

Trinidad and Tobago: Ministry of Rural Development and Local Government, the Tobago Emergency Management Agency.

UK- Anguilla: Radio Anguilla, The Four Seasons Resort Staff.

UK- Bermuda: Renaissance Re. (reinsurance firm) signed up on TsunamiZone.org

UK- Cayman Islands: Schools received the notification, all heads of Government Agencies, Members of the Legislative Assembly, media, consulates.

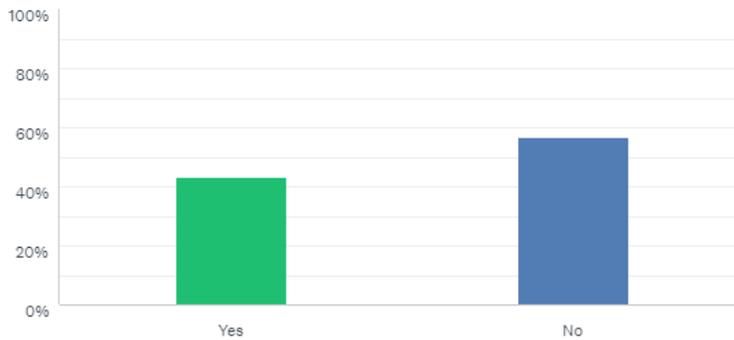
UK- Turks and Caicos Islands: Ministry of Health, Ministry of Home Affairs, 911 ECC, TSART, etc.

USA- Puerto Rico: Many including public and private schools, colleges and universities, hospitals, municipalities, state government agencies (NMEAD, CFSE, State Police Department, local legislature, correctional facilities, PRWA, retirement service, Capitol Superintendence, Puerto Rico Department of Education), Hotels (Courtyard Marriot San Juan Miramar, TRYP by Wyndham, Embassy Suites by Hilton, and Hotel Villa Cofresí), Pfizer Barceloneta, DDR Corp, ProMed Molded Products, Farmacia Gloriel, Flanes Cedo, A&M exterminating services, Constellation Health, Industrial Improvements, Inc, AS trading LLC., Instituto Pre-vocacional de Puerto Rico, Miriam's Home Inc, Centro Ayani Inc., Military Auxiliary Radio System Army, Fundacion Mayaguez 2010, Centro Sor Isolina Ferre, Union Puertorriqueña de los Adventistas del 7mo Dia, FFA Puerto Rico, Empresas Condado and federal government (FEMA, NOAA, NWS, US Army, PR National Guard, National Park Service, 156th Airlift Wing).

Venezuela: Military agencies.

Q47 3.F.1: Is your country already implementing the Community Performance Based Tsunami Recognition Program (TsunamiReady or Tsunami Ready)?

Answered: 37 Skipped: 0



ANSWER CHOICES	RESPONSES	
▼ Yes	43.24%	16
▼ No	56.76%	21
TOTAL		37

Comments:

Aruba: After evaluating all actions Crisis Management Office recognize the agency with bronze-silver or gold certification.

Costa Rica: But for the pacific coast.

Honduras: Cedeño, Marcovia Choluteca sur de Honduras // Omoa Puerto Cortes norte de Honduras.

Nicaragua: We are implementing the Community Performance Based Tsunami Recognition Program but don't have the certification yet.

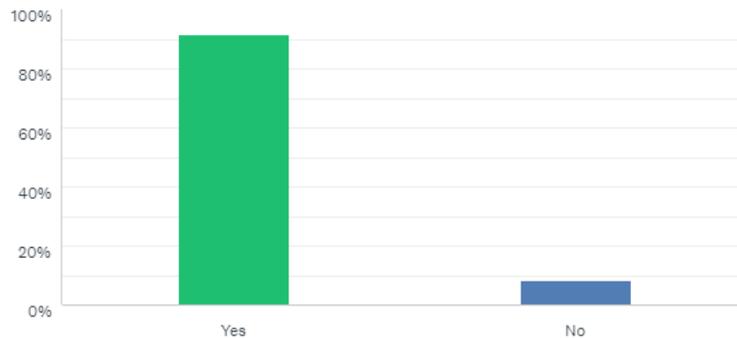
Trinidad and Tobago: Attempts are being made to make Tobago Tsunami Ready, followed by the 14 municipalities in Trinidad.

UK- Anguilla: We are currently awaiting the re-certification process.

USA- Puerto Rico: All coastal communities.

Q48 3.F.2: Is your country interested in implementing the Community Performance Based Tsunami Recognition Program (TsunamiReady or Tsunami Ready)?

Answered: 35 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	91.43% 32
No	8.57% 3
TOTAL	35

Comments:

Antigua & Barbuda: Responsibility of the TNC.

Brazil: I believe that other types of disasters are more priority for investments in the country.

Colombia: El tema es objeto de discusión a nivel nacional.

Dominican Republic: Efforts have been made for the communities of Puerto Plata, Bayahibe, Azua and San Cristobal (Palenque, Nigua and Haina).

Jamaica: Cannot comment on that.

NL- Bonaire, Saba, Sint Eustatius: But maybe not yet.

UK- Bermuda: Yes, depending on what is involved (e.g. the limitations we have).

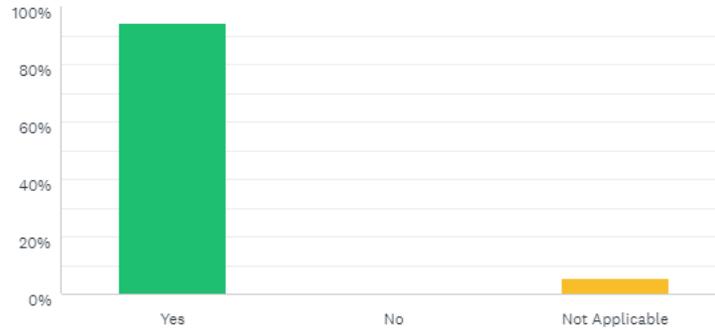
USA- Puerto Rico: Continuous Effort part of NTHMP.

Q49 3.F.3:How many communities in your country have already been designated as TsunamiReady® or Tsunami Ready?
 Q50 3.F.4:What is the target number of Tsunami Ready communities in your country/territory you expect will pursue Tsunami Ready recognition?

Country	TsunamiReady® or Tsunami Ready Communities	Target Number
Antigua and Barbuda	0	5
Aruba	0	1
Bahamas	0	25
Barbados	0	1
Belize	6	8
Brazil	0	0
Colombia	0	-
Costa Rica	2	27
Cuba	0	5
Curacao	3	5
Dominica	0	2
Dominican Republic	0	4
France (Martinique, Guadeloupe, St. Barthelemy, St. Martin)	0	-
Grenada	0	7
Guatemala	0	1
Guyana	0	0
Haiti	0	20
Honduras	10	10
Jamaica	0	0
Mexico	0	0
Netherlands (Bonaire, Saba and Sint Eustatius)	0	3
Nicaragua	0	8
Panama	0	1
Saint Kitts and Nevis	9	8
Sint Maarten	0	1
Saint Vincent and the Grenadines	0	3
Saint Lucia	0	-
Trinidad and Tobago	0	15
UK-Anguilla	30	30
UK-Bermuda	0	1
UK-British Virgin Islands	2	1
UK-Cayman Islands	0	10
UK-Montserrat	0	3
UK-Turks and Caicos	0	-
US-Puerto Rico	46	46
US-Virgin Islands	3	3
Venezuela (Bolivarian Republic of)	0	3
TOTAL	111	257

Q51 4.1: Through participating in the CARIBE WAVE 18 Exercise, the agencies in the Country/Territory (TNC/TWFP/NDEMO) have a better understanding of their responsibilities and roles in tsunami emergencies.

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	94.44% 34
No	0.00% 0
Not Applicable	5.56% 2
TOTAL	36

Comments:

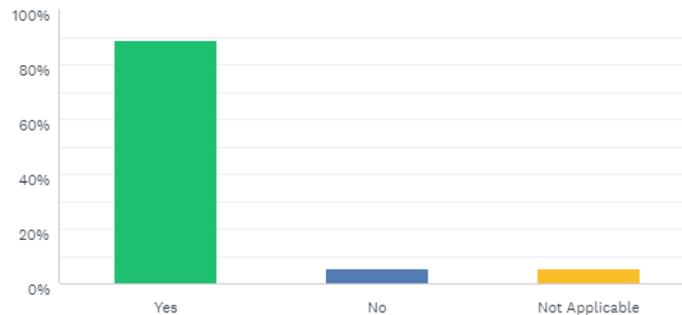
Dominican Republic: Si existe un comprension mejor, pero hay que seguir trabajando para fortalecer aun mas.

UK- Bermuda: Yes, but still a long way to go for no real response plan!.

USA- US Virgin Islands: There was very limited participation in this year's exercise.

Q52 4.2: Gaps in capability and capacity have been identified.

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	88.89% 32
No	5.56% 2
Not Applicable	5.56% 2
TOTAL	36

Comments:

Belize: Messages need to forward not only to TWFP and Alternate but to participants that are participating in the exercise.

Dominican Republic: yes, lack of involvement of the agencies that must assume a role in the emergency.

NL- Bonaire, Saba, Sint Eustatius: Some changes in the protocols are made as a result of the test.

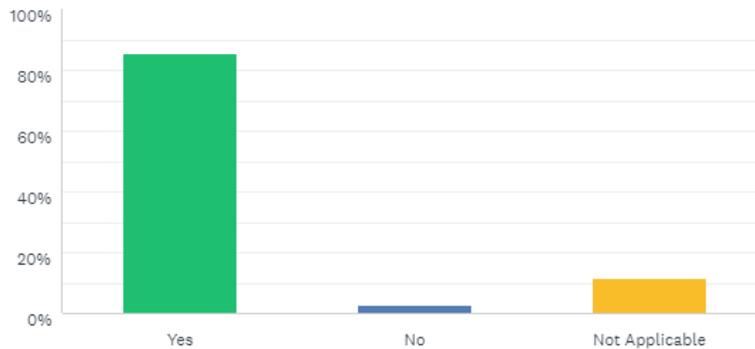
UK- Bermuda: With every exercise!.

USA- Puerto Rico: Due to Hurricane Maria disaster, problems with communication systems have been identified. To strengthen our messaging means we have identified mass notification systems with remote activation capabilities and servers located outside of Puerto Rico region.

USA- US Virgin Islands: There was very limited participation in this year's exercise.

Q53 4.3: The Country/Territory enhanced relationships with and among the Tsunami Warning System stakeholders as a result of the exercise.

Answered: 35 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	85.71% 30
No	2.86% 1
Not Applicable	11.43% 4
TOTAL	35

Comments:

Dominican Republic: The NDMO that had to comply with a part of the exercise did not perform the process to send the alert as established in its procedures manual.

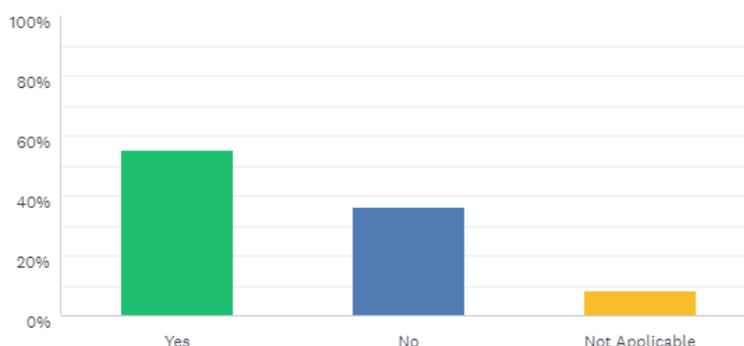
Trinidad and Tobago: In house TTX only.

UK- Bermuda: Our TWFP alternate agency, RCC Bermuda Radio (Marine and Ports Government Dept.) participated by observing operations at BWS. This helped enhance our relationship with them with respect to this Tsunami Exercise. Next year we plan to run the event at their premises, with more limited communication capacity (as a back-up to preferred BWS).

USA- US Virgin Islands: There was very limited participation in this year's exercise.

Q54 4.4: News media participated and covered the exercise (please provide electronic links if applicable).

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	55.56% 20
No	36.11% 13
Not Applicable	8.33% 3
TOTAL	36

Comments:

Antigua and Barbuda: <https://www.facebook.com/NodsAntiguaBarbuda/>

Aruba: Bureau Rempenbestrijding Aruba [facebook/24.ora.com/awe24.com/amigoe](https://www.facebook.com/awe24.com/amigoe) di [aruba/masnotica.com](https://www.aruba.com/masnotica.com)

Dominican Republic: Two TV programs were visited before the exercise, but the media did not cover the event taking place.

Mexico: <http://www.yucatan.com.mx/merida/proteccion-civil-declara-yucatan-preparado-ante-fenomenos-naturales>, <http://yucatanalamano.com/destacado/simulacro-de-tsunami-en-el-cuyo/>, <https://laverdadnoticias.com/quintanaroo/Cancun-preparado-contra-tsunamis-PC-20180316-0001.html>, <https://www.lajornadamaya.mx/2018-03-13/Anuncian-simulacro-de-alerta-de-tsunami-en-Isla-Mujeres>, <https://sipse.com/novedades/simulacro-alerta-tsunami-semar-quintana-roo-playas-clima-288694.html>

UK- Bermuda: Local press (digital and hard copy) participated, e.g. Royal Gazette and Bernews, by sharing the press release. ZBM local TV news also covered the event with some brief filming and interviewing. See BWS Facebook page feed for details - <https://www.facebook.com/BermudaWeatherService>

UK- Cayman Islands: <https://caymannewsservice.com/2018/03/tsunami-exercise-planned-to-check-responses/> and also here: <https://www.caymancompass.com/2018/03/15/agency-tests-tsunami-response-with-drill/> and here: <http://cayman27.ky/2018/03/hmci-uses-technology-to-monitor-tsunamis/> and here: <http://cayman27.ky/2018/03/hazard-management-tests-tsunami-emergency-response/>

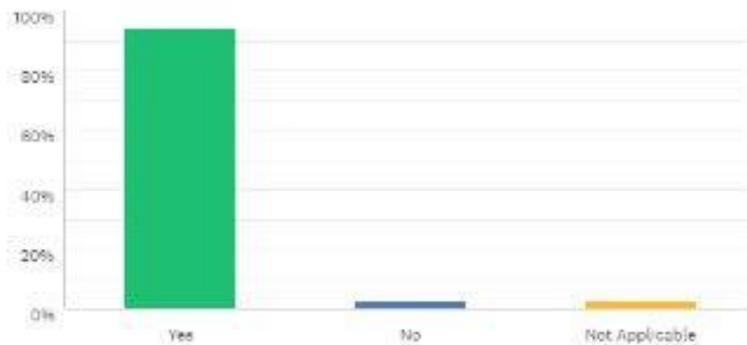
USA- Puerto Rico: Radio (WABA, Radio Paz, WPAB, Radio Isla, WPRA 990am), TV (Noticentro-

WAPA, WIPR, WOLE), <https://www.telemundopr.com/noticias/destacados/Red-Sismica-hace-llamado-a-participar-del-Caribe-Wave-2018-476572633.html> <https://impactolatino.com/puerto-rico-inicia-ejercicio-simulacro-tsunami-caribe-wave/> <https://laislaeste.com/2018/03/14/listos-para-simulacro-de-tsunami-caribe-wave-2018/> <http://static-end.gfrcdn.net/noticias/locales/nota/laredsismicacelebraraelcaribewave2018-2404660/> <https://www.youtube.com/watch?v=Ih51xhM4oXA> <https://radiorescate.com.ve/simulacro-de-tsunami-caribe-wave-2018/>

USA- US Virgin Islands: The focus was on Tsunami Preparedness Week. See link <http://viconsortium.com/featured/tsunami-preparedness-week-starts-today/>

Q55 4.5: Overall, the exercise planning, conduct, format and style were satisfactory.

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	94.44% 34
No	2.78% 1
Not Applicable	2.78% 1
TOTAL	36

Comments:

Antigua and Barbuda: There were a number of challenges highlighted within the target sector, which was the goal of this particular exercise.

UK- Bermuda: Planning went well in lead up to exercise - just no response plan formerly in place.

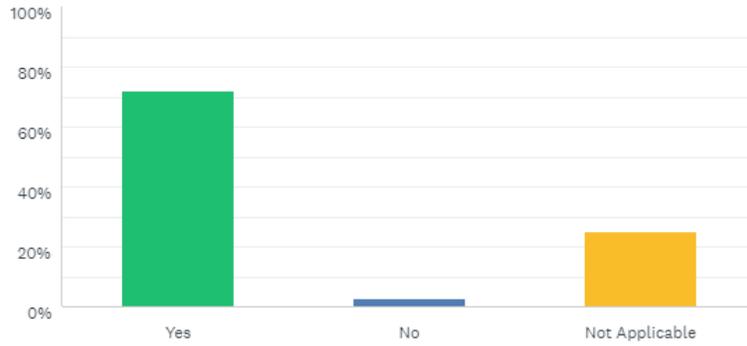
UK- Anguilla: It was toned down this year as stated before but a functional exercise is planned later in the year.

USA- PUERTO RICO: At PRSN, the exercise went well and every shift involved worked in the exercise; Analysts received training.

USA- US Virgin Islands: Aware of 4 private schools a tsunami drill this year.

Q56 4.6: Exercise planning at the international level went well.

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	72.22% 26
No	2.78% 1
Not Applicable	25.00% 9
TOTAL	36

Comments:

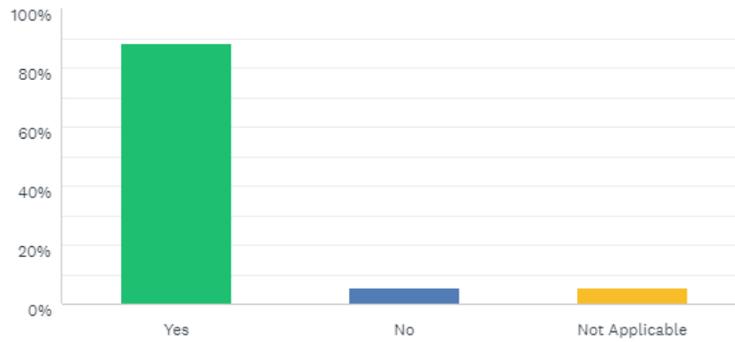
Belize: Needed to included the participants in the email messages.

Trinidad and Tobago: In house TTX only.

USA- US Virgin Islands: There was very limited participation in this year's exercise.

Q57 4.7: Exercise planning at the national level went well.

Answered: 35 Skipped: 2



ANSWER CHOICES	RESPONSES	
▼ Yes	88.57%	31
▼ No	5.71%	2
▼ Not Applicable	5.71%	2
TOTAL		35

Comments:

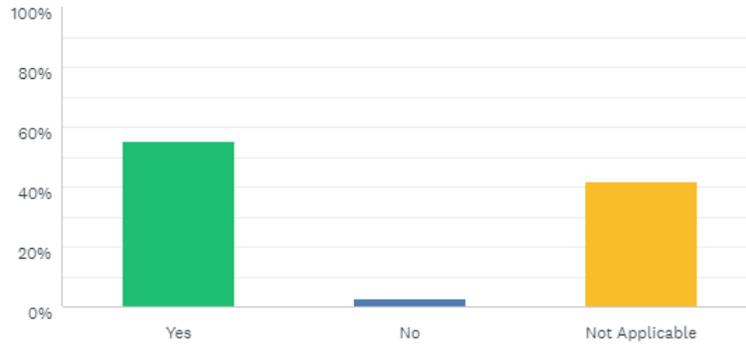
Jamaica: Small scale reasonable.

UK- Turks and Caicos Islands: Due to competing activities from other Ministries /Departments during the week of CaribeWave, the level of participation this year was low.

USA- Puerto Rico: PRSN coordinated with NWS-NOAA, PTWC.

Q58 4.8: Exercise planning at the state/local level went well.

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	55.56% 20
No	2.78% 1
Not Applicable	41.67% 15
TOTAL	36

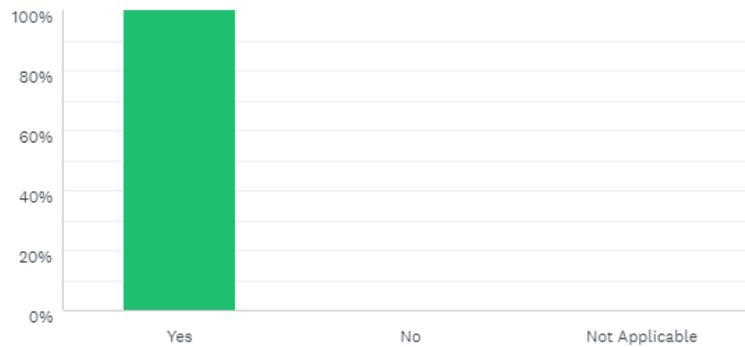
Comments:

Antigua and Barbuda: Relatively well, however certain key sector agencies exhibited critical deficiencies.

USA- Puerto Rico: PRSN coordinated with PREMA, PREMA regional zones and municipalities, PR Broadcasters Association, EAS committee and NWS-SJ.

Q59 4.9: The CARIBE WAVE 18 Tsunami Exercise website pages (eg. caribewave.info, tsunamizone.org/caribbean) were useful.

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	100.00% 36
No	0.00% 0
Not Applicable	0.00% 0
TOTAL	36

Comments:

Guatemala: Registration and Materials.

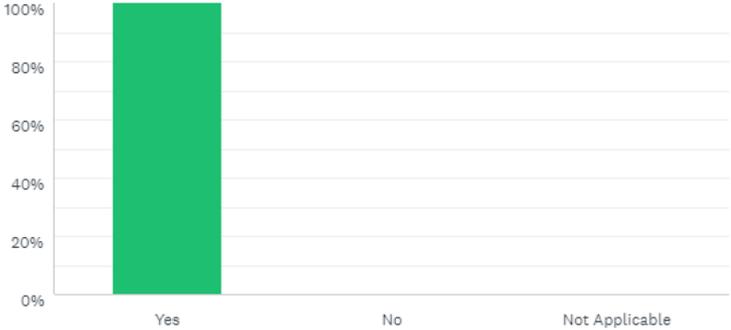
USA- Puerto Rico: PRSN webpage for participants in PRVI region: caribewave.uprm.edu

Q60 4.10: How many people do you estimate participated in the exercise within your country/territory (use own statistics or tsunami.zone registration system)?

Country	Q60
Anguilla	100
Antigua and Barbuda	-
Aruba	9,000-12,000
Bahamas	-
Barbados	350-400
Belize	-
Bermuda	400
Bonaire	0
Brazil	As the simulation was only internal, about 10 agency at federal, state and municipal level participated
British Virgin Islands	5,398
Cayman Islands	250
Colombia	1
Costa Rica	20
Cuba	Some thousand...
Curaçao	50
Dominica	-
Dominican Republic	5,000
France	78,780 in total for France among which: Guadalupe: 43,912 Martinique: 34,627 St-Martin/St-Barth: 186 France: 55
Grenada	8,000
Guatemala	10
Guyana	25
Haiti	As in TsunamiZone
Honduras	Fue un ejercicio manejado a lo interno de COPECO
Jamaica	-
Mexico	850
Montserrat	4
Netherlands	5
Nicaragua	90
Panama	6,500
Puerto Rico	113,543
Saba	-
Saint Kitts and Nevis	-
Saint Lucia	5
Saint Vincent and the Grenadines	400
St Eustatius	-
Sint Maarten	30
Suriname	-
Trinidad and Tobago	164
Turks and Caicos	30
U.S. Virgin Islands	1,300
Venezuela	402,021
TOTAL	~622,735

Q61 4.11: The CARIBE WAVE 18 Participant Handbook provided an appropriate level of detail.

Answered: 37 Skipped: 0



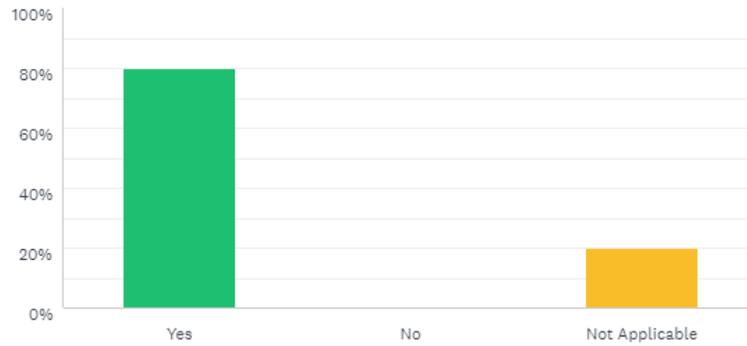
ANSWER CHOICES	RESPONSES
Yes	100.00% 37
No	0.00% 0
Not Applicable	0.00% 0
TOTAL	37

Comments:

USA- Puerto Rico: CW2018 Handbook does not directly apply to PRVI region; PRSN prepared revised version for local participants with domestic product timeline.

Q62 4.12: The CARIBE WAVE 18 Webinars were helpful in preparing for the exercise.

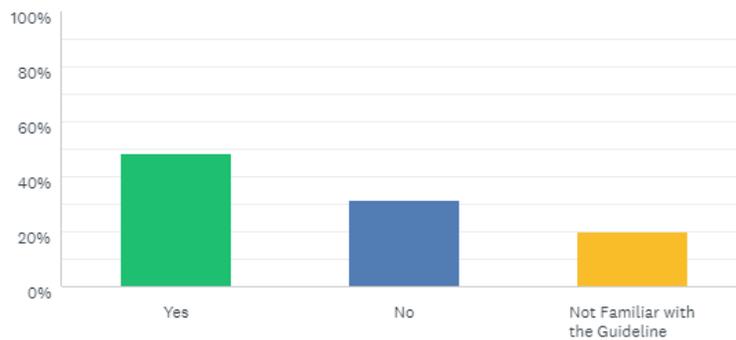
Answered: 35 Skipped: 2



ANSWER CHOICES	RESPONSES	
▼ Yes	80.00%	28
▼ No	0.00%	0
▼ Not Applicable	20.00%	7
TOTAL		35

Q63 4.13: Was the IOC How to Plan, Conduct, and Evaluate Tsunami Exercises guideline (<http://www.srh.noaa.gov/srh/ctwp>) used in preparing for the exercise?

Answered: 35 Skipped: 2



ANSWER CHOICES	RESPONSES	
▼ Yes	48.57%	17
▼ No	31.43%	11
▼ Not Familiar with the Guideline	20.00%	7
TOTAL		35

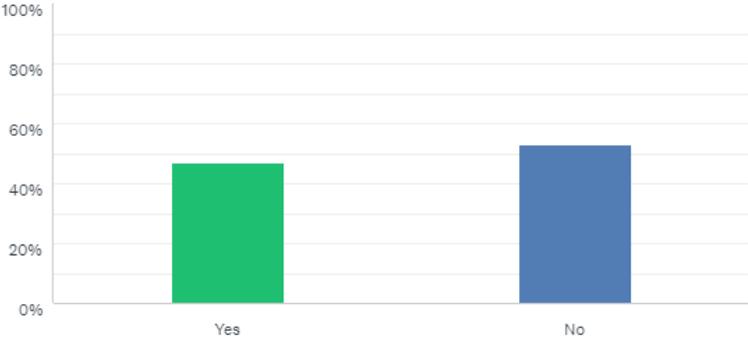
Comments:

Belize: The participants did not received the messages.

Guatemala: Some sections.

Q64 4.14: Did your country used the methodological guidelines How to Prepare, Conduct and Evaluate a Community-based Tsunami ResponseExercise (http://www.ioc-tsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=19139) before or during CARIBE WAVE Exercise 18?

Answered: 34 Skipped: 3



ANSWER CHOICES	RESPONSES
Yes	47.06% 16
No	52.94% 18
TOTAL	34

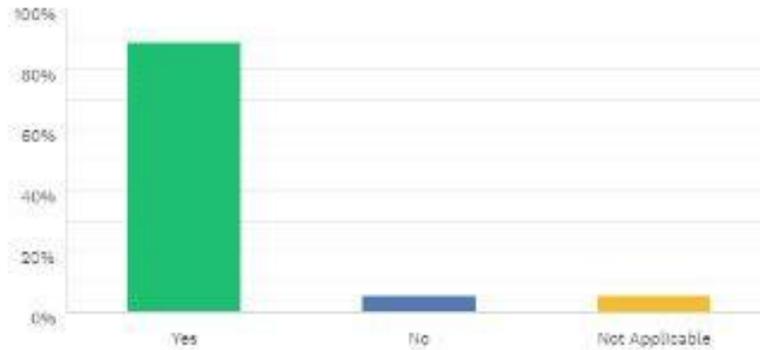
Comments:

Barbados: Guidelines would have been used by the Department of Emergency Management.

UK- Bermuda: To some extent.

Q65 4.15: This evaluation form is appropriate.

Answered: 36 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	88.89% 30
No	5.56% 2
Not Applicable	5.56% 2
TOTAL	36

Comments:

France: One form in filled by the TCN, with information hand-written on scan forms by the 1) TWFP, 2) Martinique NTWC, 3) Guadeloupe NTWC, 4) St Martin-St Barth NTWC. It would be easiest if the form could filled by each one, temporary saved and shared among us, before the final save..

NL- Bonaire, Saba, Sint Eustatius: Maybe a bit more compact will be fine.

USA- Puerto Rico: This evaluation form is not aimed for PRVI participants; Another evaluation form for domestic participants to complete and that is used by NTC/NTWC to complete the International IOC Evaluation for CW2018.

Q66 4.16: Please provide a general statement on your CARIBE WAVE 18 Tsunami Exercise experience, about what went well, what did not go well and what could be improved, in terms of both exercise planning and exercise conduct. You may comment about international, national, provincial and/or local level aspects. Also please share recommendations for the CARIBE WAVE 19 exercise, format, scenario, etc.

Aruba: As Crisis Management Office we was pleased with the outcome of participation true the 2 month's promotion to get the community and first responders involve and participating in Carib Wave.

Bahamas: The Tsunami Exercise was a great experience for The Bahamas, as we were able to test our communication sytems throughout the country. The Bahamas is an Island nation where we have a few communities with 2-5 persons living, Islands with less than 30 persons and the main land with over 100,000 persons. The entire country was made aware of the exercise from the Prime Minister and his Cabinet, all Government agencies, Family Island Administrators assigned to the 20 inhabited Islands and the Emergency Support Function groups(ESF), all media houses. The National Emergency Operation Center(NEOC) was activated. A meeting will be held to ascertain what could be improved.

Barbados: The exercise at the local level was used to test the ability of the Barbados Meteorological Services to operate at an alternative location in case our current one was compromised. This exercise showed some gaps in communication which need to be addressed urgently. It also showed the need for all personnel to be exposed to this type of exercise.

Belize: The webinar and handbook was very usefull, the main problem during the exerise was only TWFP and Alternate recieved the messages and they were both out of the country, People that are register for webinar and recived the handbook, the messages should received the message also.

Brazil: From now on we congratulate the initiation and the organization of the simulation. For Brazil, it was the first simulation for this type of disaster that we participated in after the responsible bodies (Focal Point and Monitoring and Alert). The proposal was to test the flow of information from the alert and trigger the response agencies at the federal and state levels. From the simulation, the activation and mobilization procedures were stipulated.

Colombia: La participación por Colombia en el ejercicio se limitó al Punto Focal (TWFP) en las actividades relacionadas con el objetivo 1 del manual (recepción de productos de tsunami en los TWFP).

Costa Rica: SINAMOT needs to review its internal protocols. At a national level they have to define a faster procedure for regional and local tsunamis Protocols for warning dissemination to the public must be set up.

Cuba: We have been working on improving our capabilities to measure and transmit sea level data in real time, We have been working on improving our capabilities to measure and transmit sea level data in real time. It was possible to count on young personnel entangled in the new forecast products in the recent Cartagena training that worked in the Institute of Marine Sciences and supported the Civil Defense. We must expand the methods and channels of communication at the national level.

Dominican Republic: Everything related to this Caribbean wave 2018 exercise was well planned by the international organizations from the desire to involve public and private entities through a web page. The exercise manual that was made for this exercise was explicit and easy to understand. The Tsunami Warning Focal Point carried out the publicity that was within our reach, we visited audiovisual and radio media, published on the social networks information about the exercise, also on our website, which generated more than four thousand nine hundred people enroll in the exercise through the website tsunamiszone.org. Regarding the planning of the exercise among the established state agencies comprising the National Center for Seismology (CNS), formerly ISU, The Emergency Operations Center (COE) and the National Office of Meteorology (ONAMET), we understand that COE as agency in charge of country coordination in the face of the real tsunami, did not assume its role properly because it was limited during the exercise to receive the information from ONAMET and not disseminated to other operational entities of the country's emergency system. We suggest that prior to the next exercise, regional and local entities should coordinate an inter-institutional awareness meeting regarding tsunami emergency management, since our vision as a country in the future is to be able to mobilize communities in coastal areas.

France: Caribewave exercise does not use the usual means for PTXC bulletin dissemination. So it is not possible to test in "real" condition the whole process of alert.

Grenada: Caribewave 18 exercise was successful for Grenada, we were able to test an aspect of evacuation never tested before. Focus was placed on testing the evacuation of vulnerable people in the affected communities; children living with disabilities, babies, toddlers and ordinary children. (We were able to evacuate almost 2000 students during the exercise). The testing of that area brought into sharp focus the need ensure the final SOP for Tsunami Response is very inclusive and speaks specifically to our vulnerable groups, ensuring we have appropriate transportation and volunteers to evacuate these groups. We also saw the need to have a more effective communication tool to ensure everyone receive the alerts and can act promptly. The importance of having our emergency responders not just apart of the exercise but apart of the planning of the exercise. One of the most important outcomes from the exercise for us, is the increased level of awareness among the populace about this emerging hazard in the Caribbean. And the annual exercise together with the Tsunami Ready project currently undertaken in the Northern parish, is certainly helping in this regard. It is now important that ensure we use this window of heightened awareness to drive the message home, thereby creating a new culture of safety about Tsunamis in the country.

Guatemala: For Guatemala, INSIVUMEH, these exercises are very important as well as all the information sent by PTWC which is the bases of all their alerting activities.

Guyana: This year, the participation in the exercise was from a wider cross section of agencies. IT was recognized that even though the chance of a tsunami affecting Guyana is small, the chance of over-topping of the sea defense is high. Just 2 weeks before the tsunami exercise, the country experienced over-topping of the sea defense in some areas. The different agencies recognized the importance of preparing for such over-topping whether caused by a tsunami, the tides or wind generated waves.

Haiti: For caribewave 2018 some of my comments or suggestions are not taken in account.

Honduras: Nos parece que los ejercicios tienen un alto contenido de profesionalismo desde Honduras felicitamos estas iniciativas y sugerimos sigan adelante, nos gustaría tomar en

cuenta montar un ejercicio y su organización en Centro América podría ser Honduras y desde nuestro país generar todos los productos que requieren los países para tomar decisiones.

Jamaica: Area for improvement Jamaica needs to move forward with its tsunami programme.

1. Dissemination protocols sensitization sessions needed
2. Tsunami response protocols need to be developed
3. Tsunami maps need to be prepared
4. Strengthening of seismic activity
5. Develop pre stated tsunami warning messages
6. Regular update of national emergency contact list
7. Tsunami sensitization workshops

Nicaragua: The organization of the exercise was very good. We propose a scenario northern Honduras.

NL- Bonaire, Saba, Sint Eustatius: At this moment we are still evaluating the exercise with our partners in the Caribbean.

Panama: The experience for Caribe Wave 18 was satisfactory according to plan. The participation of the population filled the expectations. Recommendations: that the next Caribbean wave 2019 contemplates several communities in the country that may be affected.

Saint Lucia: The responsibility of the Saint Lucia Meteorological Services, which is the NTWFP in Saint Lucia, is limited to the receipt and interpretation of messages from the PTWC and if necessary, in accordance to the existing SOPs, issue the appropriate statements. Saint Lucia registered to participate in the regional scenario of CARIB WAVE 18, and therefore upon receipt of the messages from the PTWC, issued the appropriate statements to the relevant agencies such as the NEMO, the Prime Minister's Office and the Saint Lucia Fire Service. There was little or no communication between the Saint Lucia Meteorological Services and the other agencies during or after the exercise.

Sint Maarten: Originally we had planned to conduct a large evacuation exercise with the inclusion of schools and businesses. Due to the passing of hurricane Irma we had to avoid national panic, so we decided to limit Caribe Wave 18 to a tabletop exercise for the NDMO and partners.

Trinidad and Tobago: In recent years the ODPM exercised its external stakeholders but chose to exercise internally this year and a number weaknesses have been identified which have been addressed.

UK- Anguilla: Planning started in advance (Jan/Feb) and was going well, until a number of challenges came up. The inability of the school's to fully participate and the closure of the hotels and other businesses since the passage of Hurricane Irma hindered participation. It is planned that later in the year we will have a functional exercise.

UK- Bermuda: The messaging went well for the most part. There were some delays to some of my Bermuda Weather Service (BWS) staff receiving the message emails, but that is probably a limitation of long email distribution lists. Prior to the exercise day, BWS had some questions for CTWP/PTWC that have yet to be answered. The webinars were useful, but some of the content

was rather basic and repeated. One webinar suggestion is to walk through the first couple of messages for each scenario to get a feel of how the wave propagates etc. Without Bermuda being listed in the initial message #1, no action was taken by BWS, as per our SOPs. It was only when Bermuda was listed in the threat message in message #2 that BWS took action and issued a Tsunami Warning - we would appreciate hearing feedback on this... The Bermuda Government (EMO) still has no formal plan on how to react to BWS issuing a Tsunami Watch or Warning. Indeed BWS still await a formal letter of delegation from the Bermuda Government in order to issue Tsunami Watches and Warnings - upon completion of this there may be the opportunity for BWS to issue agreed messaging statements to the Bermuda community in terms of evacuation of low lying areas etc. Upon completion of the exercise and review of BWS SOPs, as well as contacting Paul Huang at NTWC, there was some confusion over messaging from PTWC and NTWC and whether BWS/Bermuda should participate in both CaribeWave and LANTEX. However, upon consultation with Christa G. von Hillebrandt-Andrade/CTWP, it appears that Bermuda only need concern themselves with PTWC messaging, including their Information Statements and Threat Messages. External funding to attend overseas training/workshops/committees would be most welcome. Unfortunately, tsunamis are viewed as a low risk event in Bermuda, especially when compared to our near annual tropical cyclone threats. Therefore, Government engagement in this type of natural disaster is low priority. James Dodgson, BWS Director.

UK- British Virgin Islands: It was good to see persons of different sectors showing a willingness to take part in the exercise. It can be deduced from my observations that people were more willing to take part given the lackadaisical approach taken in the past, prior to the 2017 hurricanes. There was a limitation in the number of warning systems available that would minimize citizen impact. damage to multiple infrastructures across the territory has grossly hampered the participation of some government offices and businesses. Not enough bullhorns and vehicles owned by emergency services to effectively ensure warn the public in the shortest time possible due to post hurricane challenges.

UK- Cayman Islands: Really good exercise - thanks!

UK- Montserrat: Montserrat has begun its Tsunami readiness program. with the erection of our first tsunami awareness sign on one of our major beaches. evacuation routes have been identified and rendezvous point identified also. work is in progress to have our model tsunami safe community completed and ready for testing by conducting a simulation exercise.

USA- Puerto Rico: During the CARIBE WAVE 2018 Exercise the Puerto Rico Seismic Network (PRSN) tested multiple communication methods with emergency management agencies in our area of responsibility (the Puerto Rico and Virgin Islands Region). The agencies within the (seismic) area of responsibility of the Puerto Rico Seismic Network are: Puerto Rico Emergency Management Agency (PREMA, Puerto Rico), National Weather Service San Juan Forecast Office (NWS-SJ, Puerto Rico), Department of Disaster Management (DDM, British Virgin Islands), Virgin Islands Territorial Emergency Management Agency (VITEMA, US Virgin Islands), Oficina Nacional de Meteorología (ONAMET, Dominican Republic) y el Instituto Sismológico Universitario (ISU, Dominican Republic). Among the PRSN communication methods tested are: the Broadcast System (System to Disseminate Information on Earthquakes and Tsunamis), dedicated telephones (ring downs and private telephone line), the PREMA radio frequency, RSS News (PRSN), text message (TWFP, Tsunami Warning Focal Points), e-mail lists (emergency, press, and public), fax, web page and social media (Facebook and Twitter). Communication tests were conducted by ham radio with radio amateur volunteers

between the PRSN in Mayagüez and the NWS in San Juan. In addition, the mass messaging system was tested, through the Regroup Company, as a redundant method of communications for the TWFP service lists (emails, text messages and calls). PRSN updated the official web page for the CARIBE WAVE 2018 Exercise (<http://caribewave.uprm.edu/>) for Puerto Rico and Virgin Islands. This web page contains all the materials and guidelines developed by the PRSN for this year's exercise, the EAS activation announcement for Puerto Rico and the promotion to complete the Official Registry of the Exercise (at tsunamizone.org), among other materials. Starting at February 28, 2018, pre-exercise communication tests were conducted to promote Caribe Wave Exercise in the Puerto Rico and Virgin Islands Region. These tests were issued on February 28, March 10 and 14, by all communication lines available in PRSN (dedicated telephones, radio, emails, fax, text message, RSS News, official exercise web page and social media). On March 15, 2018 we issued a total of 18 messages during Caribe Wave 2018 Exercise. The first one was a reminder of the exercise at 9:06 am to public PRSN service list. The first PRSN bulletin was issued at 10:00 a.m. through the RSS, email service lists, SMS, web page and social media, announcing the beginning of the exercise. In addition, 16 Official PRSN Bulletins were issued with Tsunami Warning, Advisory and Cancellation information (in Spanish and English), as issued by the PTWC in domestic products for Puerto Rico and the Virgin Islands. All bulletins (from #01 to #16) were disseminated by NMEAD Radio Frequency, dedicated telephones lines, emails, fax, RSS News, text messages and calls (these last two only to local TWFP). In general, the dissemination of the automatic products to emergency agencies in our region took place at approximate times of 0 to 2 minutes. Agency-to-Agency (a total of 8 emergency agencies) calls through the dedicated telephone line were completed, on average, within 8 minutes.

USA- US Virgin Islands: - The need to address Hurricanes Irma & Maria Recovery impacted participation and focus of territorial efforts. - Most participants did not register their activities on tsunamizone.org, even though, they were asked and reminded several times to do so.

Venezuela: For our country, the exercise was satisfactory, we continue working on the improvement of the action plans in the coastal states so that the response has the due affect when responding to the emergency, one of the most outstanding achievements was the incorporation of non-coastal states, as part of the expansion of responding agencies in their support phase, for those territories that could be affected by the adverse effects of the event. Our country thanks as always the invitation to participate in the next Caribe Wave.

Supplement B. Sea Level Status

As part of the CARIBE WAVE 18 Regional Tsunami Exercise, the CTWP analyzed the status of sea level stations. The PTWC provided forecasted maximum wave heights (not first arrival times, calculated by an algorithm for exercise purposes) for a number of stations in the simulated bulletins: 48 for the Barbados, 49 for the Colombia, and 42 for the Puerto Rico scenario. A comparison between tide gauges used for PTWC in the tsunami products and the stations listed on the Tide Tool during the exercise time frame, are shown in the tables as follow. Due to several stations reported in the simulated products have not been in operation for many years or were recently impacted by the hurricanes, it is recommended to evaluate which stations are reliable for the PTWC tsunami products. In addition, PTWC remarks the importance to have in mind that all tsunami ETAs are only estimated times. Member States and Territories, using Tide Tool as an operational support software during a tsunami event, must not expect waves to arrive exactly at the ETA and especially must not to cancel a warning without waiting a “decent” amount of time (>1 hour approx.) after the ETA if no waves or only very small waves are observed.

After the analysis, some stations are recommended to be removed from PTWC Products due to Non-Operational Status (> 12 months):

BRIDGEPORT BB (????)
PARHAM AT (Oct2014)
CHARLOTTEVILLE TT (Aug2015)
AGUADILLA PR (Jan2016)
UTILA ISLAND HN (Jun2016)
JACMEL HT (Aug2016)
ISLA MUJERES (Sep2016)
PUERTO ESTRELLA CO (Oct2016)
BARAHONA DO (Jan2017)

The stations recommended to be included in PTWC Products based on Tide Tool list:

BARBUDA AG
BOCAS DEL TORO PA
CULEBRA PR
ORANGESTAD AW
PORT OF BELIZE
PORT ST CHARLES BB
SETTLEMENT BS

BARBADOS SCENARIO

CARIBE WAVE 18 PTWC Text Products – msg #9			PTWC Tide Tool	
GAUGE LOCATION	GAUGE COORDINATES	TIME OF MEASURE (UTC)	STATION	ETA
WRIGHT BEACH NC*	34.2N 77.8W	1959		
TRIDENT PIER FL*	28.4N 80.6W	1951		
LIMON CR*	10.0N 83.0W	1846		
SAPZURRO CO*	8.7N 77.4W	1823	WRIGHT BEACH NC*	2002
SAN ANDRES CO*	12.6N 81.7W	1817	TRIDENT PIER FL*	1935
EL PORVENIR PA	9.6N 78.9W	1817	PORT OF BELIZE	1935
COVENAS CO	9.4N 76.2W	1819	BOCAS DEL TORO PA	1905
PORT ROYAL JM*	17.9N 76.8W	1813	PUERTO CORTES HN	1900
SANTA MARTA CO*	11.2N 74.2W	1726	CARRIE BOW CAY BH	1858
BERMUDA UK*	32.4N 64.7W	1718	PUERTO MORELOS MX	1848
ILE ROYAL GUIANA FR	5.3N 52.6W	1710	PUERTO MORELOS MX	1848
PUERTO ESTRELLA CO	12.4N 71.3W	1706	ROATAN ISLAND HN	1841
PORT SAN ANDRES DO	18.4N 69.6W	1702	LIMON CR*	1829
JACMEL HT	18.2N 72.5W	1658	SAN ANDRES CO*	1804
BARAHONA DO	18.2N 71.1W	1647	SAPZURRO CO*	1801
CAP HAITIEN HT*	19.8N 72.2W	1643	SETTLEMENT BS	1754
BULLEN BAY CURACAO*	12.2N 69.0W	1629	GEORGE TOWN CY	1753
PUERTO PLATA DO*	19.8N 70.7W	1625	ISLA NAVAL CO	1738
PUNTA CANA DO*	18.5N 68.4W	1627	PORT AU PRINCE HT	1737
MAGUEYES ISLAND PR*	18.0N 67.0W	1628	PORT ROYAL JM*	1732
LAMESHURBAYSTJOHNVI*	18.3N 64.7W	1618	SANTA MARTA CO*	1712
MONA ISLAND PR*	18.1N 67.9W	1624	BERMUDA UK*	1657
CAJA DE MUERTOS PR	17.9N 66.5W	1619	MAGUEYES ISLAND PR*	1631
SAINT MARTIN FR*	18.1N 63.1W	1613	ORANGESTAD AW	1625
AGUADILLA PR	18.5N 67.2W	1609	PUERTO PLATA DO*	1618
MAYAGUEZ PR	18.2N 67.2W	1609	CAP HAITIEN HT*	1618
DART 42407	15.3N 68.2W	1609	PUNTA CANA DO*	1612
ESPERANZA VIEQUES P*	18.1N 65.5W	1608	ESPERANZA VIEQUES P*	1611
ARECIBO PR*	18.5N 66.7W	1607	MONA ISLAND PR*	1608
YABUCOA PR*	18.1N 65.8W	1600	BULLEN BAY CURACAO*	1608
SAN JUAN PR*	18.5N 66.1W	1559	LAMESHURBAYSTJOHNVI*	1602
DART 41421	23.4N 63.9W	1556	CULEBRA PR	1559
LIMETREE VI*	17.7N 64.8W	1554	YABUCOA PR*	1558
ST CROIX VI*	17.7N 64.7W	1558	ARECIBO PR*	1552
BASSETERRE KN	17.3N 62.7W	1543	SAN JUAN PR*	1549
PARHAM AT	17.1N 61.8W	1526	SAINT MARTIN FR*	1548
GANTERS BAY ST LUCI*	14.0N 61.0W	1520	LIMETREE VI*	1547
DESHAIES GUADELOUPE*	16.3N 61.8W	1526	ST CROIX VI*	1545
PRICKLEY BAY GD*	12.0N 61.8W	1517	DESHAIES GUADELOUPE*	1517
POINT A PITRE GP*	16.2N 61.5W	1519	BARBUDA AG	1513
ROSEAU DM	15.3N 61.4W	1512	POINT A PITRE GP*	1502
FORT DE FRANCE MQ*	14.6N 61.1W	1509	DESIRADE GUADELOUPE*	1456
CHARLOTTEVILLE TT	11.3N 60.5W	1510	FORT DE FRANCE MQ*	1454
DESIRADE GUADELOUPE*	16.3N 61.1W	1511	LE PRECHEUR MARTINI*	1454
LE PRECHEUR MARTINI*	14.8N 61.2W	1510	LE ROBERT MARTINIQU*	1451
LE ROBERT MARTINIQU*	14.7N 60.9W	1457	GANTERS BAY ST LUCI*	1451
CALLIAQUA VC	13.1N 61.2W	1454	PRICKLEY BAY GD*	1450
BRIDGEPORT BB	13.1N 59.6W	1433	PORT ST CHARLES BB	1425

Stations with red asterisk are in both lists (see differences in times); Stations in green are not in PTWC Products; Stations in blue are not in PTWC TideTool

COLOMBIA SCENARIO

CARIBE WAVE 18 PTWC Text Products – msg #9			PTWC TideTool	
GAUGE LOCATION	GAUGE COORDINATES	TIME OF MEASURE	STATION	ETA
	LAT LON	(UTC)		
PUERTO MORELOS MX*	21.4N 86.8W	1726		
ISLA MUJERES	21.2N 86.7W	1727		
CEIBA CABOTAGE HN	15.8N 86.8W	1722		
CARRIE BOW CAY BH*	16.8N 88.1W	1710		
PUERTO CORTES HN*	15.8N 88.0W	1706		
PUERTO MORELOS MX*	20.9N 86.9W	1700		
BRIDGEPORT BB	13.1N 59.6W	1656	BERMUDA UK	1743
GANTERS BAY ST LUCI*	14.0N 61.0W	1654	PORT OF BELIZE	1731
UTILA ISLAND HN	16.1N 86.9W	1654	SETTLEMENT BS	1730
LE ROBERT MARTINIQU*	14.7N 60.9W	1649	PUERTO CORTES HN*	1656
SAINT MARTIN FR*	18.1N 63.1W	1646	CARRIE BOW CAY BH*	1654
DESIRADE GUADELOUPE*	16.3N 61.1W	1649	PUERTO MORELOS MX*	1648
PRICKLEY BAY GD*	12.0N 61.8W	1645	PUERTO MORELOS MX*	1648
POINT A PITRE GP*	16.2N 61.5W	1643	BARBUDA AG	1647
ROATAN ISLAND HN*	16.3N 86.5W	1643	PORT ST CHARLES BB	1646
LAMESHURBAYSTJOHNVI*	18.3N 64.7W	1639	DESIRADE GUADELOUPE*	1639
CALLIAQUA VC	13.1N 61.2W	1636	POINT A PITRE GP*	1637
FORT DE FRANCE MQ*	14.6N 61.1W	1636	ROATAN ISLAND HN*	1636
ROSEAU DM	15.3N 61.4W	1630	LE ROBERT MARTINIQU*	1635
LE PRECHEUR MARTINI*	14.8N 61.2W	1627	SAINT MARTIN FR*	1630
DESHAIES GUADELOUPE*	16.3N 61.8W	1631	LE PRECHEUR MARTINI*	1622
BASSETERRE KN	17.3N 62.7W	1629	LAMESHURBAYSTJOHNVI*	1621
SAN JUAN PR*	18.5N 66.1W	1618	FORT DE FRANCE MQ*	1620
CAP HAITIEN HT*	19.8N 72.2W	1611	GANTERS BAY ST LUCI*	1618
ARECIBO PR*	18.5N 66.7W	1609	PRICKLEY BAY GD*	1617
GEORGE TOWN CY*	19.3N 81.4W	1603	DESHAIES GUADELOUPE*	1615
ESPERANZA VIEQUES P*	18.1N 65.5W	1603	BOCAS DEL TORO PA	1612
AGUADILLA PR	18.5N 67.2W	1601	PORT AU PRINCE HT	1611
PORT SAN ANDRES DO	18.4N 69.6W	1607	PUERTO PLATA DO	1609
LIMETREE VI*	17.7N 64.8W	1606	CULEBRA PR	1608
ST CROIX VI*	17.7N 64.7W	1600	SAN JUAN PR*	1605
CAJA DE MUERTOS PR	17.9N 66.5W	1600	ESPERANZA VIEQUES P*	1559
MAGUEYES ISLAND PR*	18.0N 67.0W	1555	ARECIBO PR*	1559
YABUCOA PR*	18.1N 65.8W	1553	GEORGE TOWN CY*	1555
MAYAGUEZ PR	18.2N 67.2W	1558	ST CROIX VI*	1553
PORT ROYAL JM*	17.9N 76.8W	1555	MAGUEYES ISLAND PR*	1552
PUNTA CANA DO*	18.5N 68.4W	1551	YABUCOA PR*	1552
LIMON CR*	10.0N 83.0W	1542	LIMETREE VI*	1551
MONA ISLAND PR*	18.1N 67.9W	1545	CAP HAITIEN HT*	1543
BARAHONA DO	18.2N 71.1W	1536	PUNTA CANA DO*	1539
BULLEN BAY CURACAO*	12.2N 69.0W	1531	LIMON CR*	1537
SAN ANDRES CO*	12.6N 81.7W	1529	MONA ISLAND PR*	1533
DART 42407	15.3N 68.2W	1521	BULLEN BAY CURACAO*	1517
SAPZURRO CO*	8.7N 77.4W	1521	SAN ANDRES CO*	1516
PUERTO ESTRELLA CO	12.4N 71.3W	1523	ORANGESTAD AW	1514
JACMEL HT	18.2N 72.5W	1524	PORT ROYAL JM*	1512
EL PORVENIR PA	9.6N 78.9W	1513	SAPZURRO CO*	1503
COVENAS CO	9.4N 76.2W	1510	ISLA NAVAL CO	1439
SANTA MARTA CO*	11.2N 74.2W	1420	SANTA MARTA CO*	1413

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PUERTO RICO SCENARIO

CARIBE WAVE 18 PTWC Text Products – msg #9				PTWC TideTool	
GAUGE LOCATION	GAUGE COORDINATES		TIME OF MEASURE (UTC)	STATION	ETA
	LAT	LOX			
WRIGHT BEACH NC*	34.2N	77.8W	1842	WRIGHT BEACH NC*	1844
LIMON CR*	10.0N	83.0W	1711	PORT OF BELIZE	1801
SAPZURRO CO*	8.7N	77.4W	1658	BOCAS DEL TORO PA	1736
EL PORVENIR PA	9.6N	78.9W	1646	CARRIE BOW CAY BH	1724
CHARLOTTEVILLE TT	11.3N	60.5W	1642	PUERTO MORELOS MX	1714
COVENAS CO	9.4N	76.2W	1645	ROATAN ISLAND HN	1707
PORT ROYAL JM*	17.9N	76.8W	1626	LIMON CR*	1700
BERMUDA UK*	32.4N	64.7W	1622	SAPZURRO CO*	1633
PRICKLEY BAY GD*	12.0N	61.8W	1603	SAN ANDRES CO	1632
GANTERS BAY ST LUCI*	14.0N	61.0W	1602	SETTLEMENT BS	1625
SANTA MARTA CO*	11.2N	74.2W	1557	GEORGE TOWN CY	1620
LE ROBERT MARTINIQU*	14.7N	60.9W	1552	ISLA NAVAL CO	1611
CALLIAQUA VC	13.1N	61.2W	1549	BERMUDA UK*	1605
POINT A PITRE GP*	16.2N	61.5W	1545	PORT AU PRINCE HT	1604
FORT DE FRANCE MQ*	14.6N	61.1W	1545	PORT ST CHARLES BB	1552
PUERTO ESTRELLA CO	12.4N	71.3W	1537	SANTA MARTA CO*	1545
SAINT MARTIN FR*	18.1N	63.1W	1537	PORT ROYAL JM*	1544
LE PRECHEUR MARTINI*	14.8N	61.2W	1534	LE ROBERT MARTINIQU*	1540
ROSEAU DM	15.3N	61.4W	1530	PRICKLEY BAY GD*	1537
LAMESHURBAYSTJOHNVI*	18.3N	64.7W	1526	LE PRECHEUR MARTINI*	1522
DESHAIES GUADELOUPE*	16.3N	61.8W	1526	POINT A PITRE GP*	1522
DESIRADE GUADELOUPE*	16.3N	61.1W	1531	FORT DE FRANCE MQ*	1522
BULLEN BAY CURACAO*	12.2N	69.0W	1525	GANTERS BAY ST LUCI*	1521
BASSETERRE KN	17.3N	62.7W	1518	DESHAIES GUADELOUPE*	1520
JACMEL HT	18.2N	72.5W	1509	DESIRADE GUADELOUPE*	1518
CAP HAITIEN HT*	19.8N	72.2W	1506	BARBUDA AG	1514
PORT SAN ANDRES DO	18.4N	69.6W	1503	SAINT MARTIN FR*	1513
BARAHONA DO	18.2N	71.1W	1459	ORANGESTAD AW	1511
ESPERANZA VIEQUES P*	18.1N	65.5W	1453	LAMESHURBAYSTJOHNVI*	1507
LIMETREE VI*	17.7N	64.8W	1454	BULLEN BAY CURACAO*	1504
ST CROIX VI*	17.7N	64.7W	1448	ESPERANZA VIEQUES P*	1454
PUERTO PLATA DO*	19.8N	70.7W	1456	CULEBRA PR	1449
CAJA DE MUERTOS PR	17.9N	66.5W	1448	PUERTO PLATA DO*	1445
YABUCOA PR*	18.1N	65.8W	1450	CAP HAITIEN HT*	1444
DART 42407	15.3N	68.2W	1446	ST CROIX VI*	1440
MAGUEYES ISLAND PR*	18.0N	67.0W	1439	LIMETREE VI*	1439
SAN JUAN PR*	18.5N	66.1W	1438	YABUCOA PR*	1437
ARECIBO PR*	18.5N	66.7W	1437	MAGUEYES ISLAND PR*	1431
AGUADILLA PR	18.5N	67.2W	1432	SAN JUAN PR*	1428
PUNTA CANA DO*	18.5N	68.4W	1421	ARECIBO PR*	1421
MAYAGUEZ PR	18.2N	67.2W	1423	PUNTA CANA DO*	1418
MONA ISLAND PR*	18.1N	67.9W	1413	MONA ISLAND PR*	1404

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