

Department of Geology  
University of Puerto Rico, Mayagüez and  
NOAA's National Weather Service

CARIBE WAVE 2019:

Supplement Report

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UPRM Puerto Rico Seismic Network

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## Supplement A. Survey Results

### Caribe Wave 2019 Survey Report from TWFP/TNC

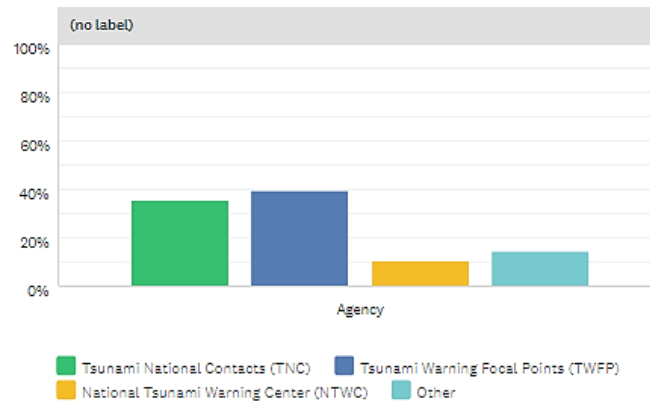
The following Member States and Territories participated in the post-exercise evaluation:

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

\* One survey submitted by the Member States for all constituents

## Contact Information – Agency

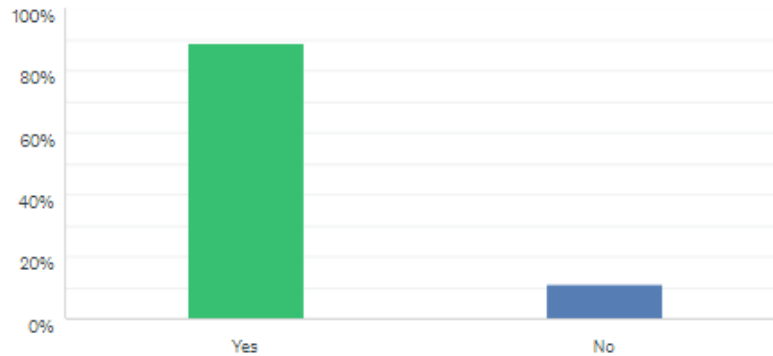
Answered: 28 Skipped: 0



(no label)					
	TSUNAMI NATIONAL CONTACTS (TNC)	TSUNAMI WARNING FOCAL POINTS (TWFP)	NATIONAL TSUNAMI WARNING CENTER (NTWC)	OTHER	TOTAL
Agency	35.71% 10	39.29% 11	10.71% 3	14.29% 4	28

**Q4: Did your country's Tsunami Warning Focal Points/National Tsunami Warning Center receive the PTWC Caribe Wave 19 initial Dummy (Start of Exercise) Message?**

Answered: 27 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	88.89%	24
No	11.11%	3
TOTAL		27

**Comments:**

**Antigua and Barbuda:** Received on time

**Belize:** Our tsunami warning national contacts received the message and forwarded to the focal points (our forecastors).

**Dominica:** Dominica registered but did not get the dummy message via email or other means.

**France:** We received only message from "meteo france"

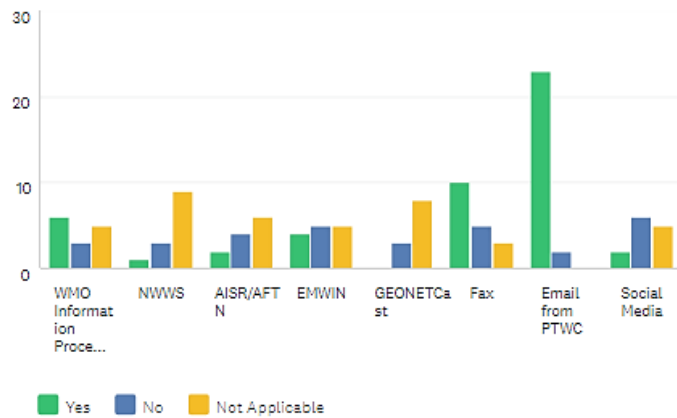
**Mexico:** It was received through the Centro de Alerta de Tsunamis as a Tsunami Warning Focal Point

**Puerto Rico:** PRSN is a TWFP Alternate for Puerto Rico

**Trinidad and Tobago:** Received and verified by both the TWFP and the NTWC

**Q5:** The PTWC issued the CARIBE WAVE 19 initial Dummy Message by several methods. Please check all methods through which the message was received by the TWFP/NTWC.

Answered: 27 Skipped: 1



	YES	NO	NOT APPLICABLE	TOTAL RESPONDENTS
WMO Information Process (e.g., GTS, WIS)	42.86% 6	21.43% 3	35.71% 5	14
NWWS	7.69% 1	23.08% 3	69.23% 9	13
AISR/AFTN	16.67% 2	33.33% 4	50.00% 6	12
EMWIN	28.57% 4	35.71% 5	35.71% 5	14
GEONETCast	0.00% 0	27.27% 3	72.73% 8	11
Fax	55.56% 10	27.78% 5	16.67% 3	18
Email from PTWC	92.00% 23	8.00% 2	0.00% 0	25
Social Media	15.38% 2	46.15% 6	38.46% 5	13

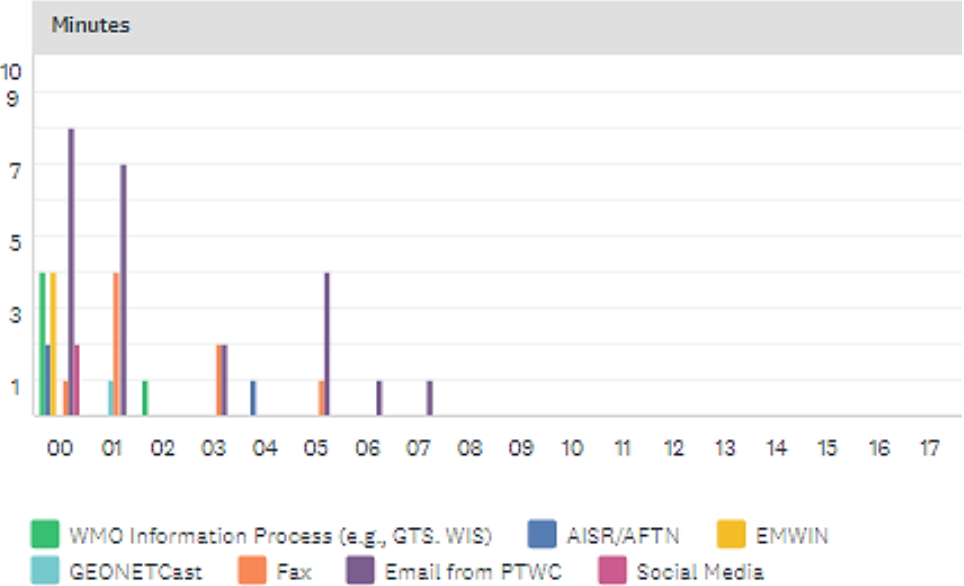
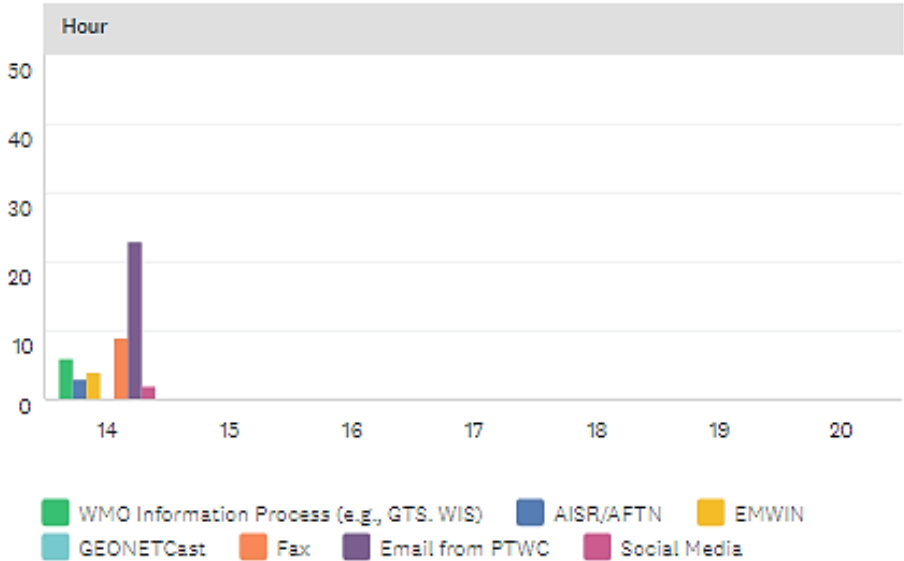
Comments (1)

**Other:**

**Saint Vincent and the Grenadines:** Had challenges receiving messages via fax (full messages not received only date and time)

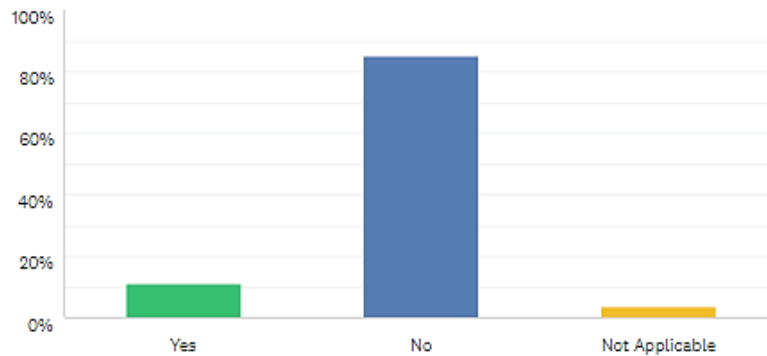
**Q6:** The PTWC issued the Caribe Wave 19 initial Dummy Message by several methods. Please indicate the time at which the message was received by the TWFP/NTWC in the different systems.

Answered: 25 Skipped: 3



**Q7: Were there any problems with the receipt of PTWC Caribe Wave 19 initial Dummy (Start of Exercise) Message?**

Answered: 27 Skipped: 1



ANSWER CHOICES	RESPONSES
Yes	11.11% 3
No	85.19% 23
Not Applicable	3.70% 1
<b>TOTAL</b>	<b>27</b>

**Comments:**

**Barbados:** The dummy message was not received by the fax. The fax is currently having issues receiving international messages and is being addressed by the service provider.

**Dominica:** Message was not received.

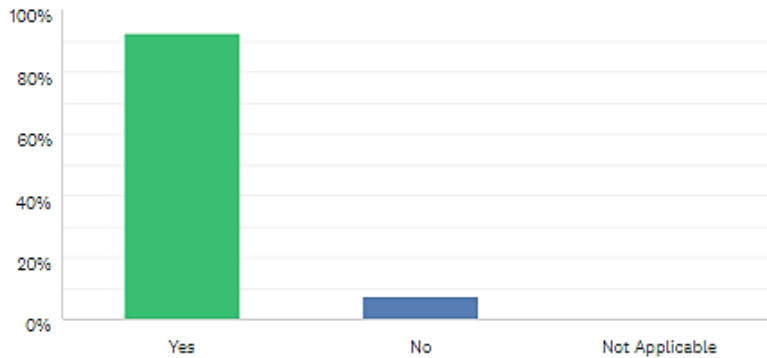
**France:** Message relieved by “meteo france”.

**Sint Maarten:** I didn't take in account that 14:00 UTC us 10:00 on Sint Maarten.

**UK-Turks and Caicos Islands:** Did not receive any message

**Q8: Did your TWFP/NTWC receive by email from PTWC the simulated exercise messages (Kick 'em Jenny or Panama scenario) at the times specified in the Exercise Manual?**

Answered: 27 Skipped: 1



ANSWER CHOICES	RESPONSES	
▼ Yes	92.59%	25
▼ No	7.41%	2
▼ Not Applicable	0.00%	0
<b>TOTAL</b>		<b>27</b>

**Comments:**

**Antigua and Barbuda:** Kick em Jenny

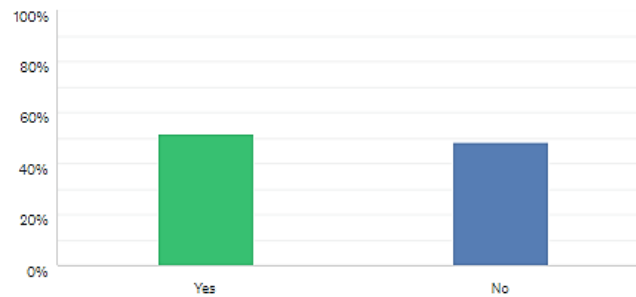
**Colombia:** La gran mayoría de los mensajes fueron recibidos en los tiempos establecidos de acuerdo al manual con un retraso menos a 5 minutos, sin embargo algunos mensajes se recibieron con un poco de retraso en el correo. Mensaje No.3, hora estimada 1440, hora de recepción 1445. Mensajes No. 8, hora estimada 1900, hora de recepción 1905. Mensaje No.10 hora estimada 2100, hora de recepción 2112. Mensaje No. 11 hora estimada 2200, hora de recepción 2210.

**Puerto Rico:** PTWC Messages for Domestic and International Products – Kick 'em Jenny



### Q9: Were any areas evacuated as part of the CARIBE WAVE 19 Exercise?

Answered: 27 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	51.85%	14
No	48.15%	13
TOTAL		27

Comments (14)

#### Comments:

**Antigua and Barbuda:** This year exercise was used to reorient the major stakeholders. According to Keithley Meade from the Antigua nd Barbuda Met Services (TWFP), desktop exercise executed by NTWC.

**Barbados:** The Barbados Port Inc executed a manual evacuation of some of its departments.

**Colombia:** Una poblacion de la Armada Nacional realize un ejercicio de evacuacion en San Andres para probar rutas de evacuacion en la isla.

**Costa Rica:** Cahuita National Park

**Dominica:** A school was evacuated

**Mexico:** The evacuation of some areas, with the participation of 500 people

**Nicaragua:** Three communities of the South Caribbean of Nicaragua were evacuated: Bluefields, Corn Island and El Bluff.

**NL-Bonaire, Saba, Sint Eustatius:** As TWFP we are not responsible for this part of the exercise (we only communicate the warning information). The local authorities will answer this question.

**Puerto Rico:** Different communities at different towns. The PRSN evacuated El Mani Community at Mayaguez.

**Saint Lucia:** 10 schools in the Castries Basin and 3 schools in Canaries were evacuated

**Saint Vincent and the Grenadines:** Calliaqua Anglican School

**Trinidad and Tobago:** The ODPM only conducted an in house tabletop exercise.

**UK- Anguilla:** Primary schools and some tourism properties and businesses in the inundation areas performed partial or full evacuations.

**UK-Turks and Caicos Islands:** Did not receive any message

**Q10:** Overall, how timely before Estimated Time of Arrival (ETA) was the evacuation completed from 1 (after ETA) to 5 (well before ETA)?

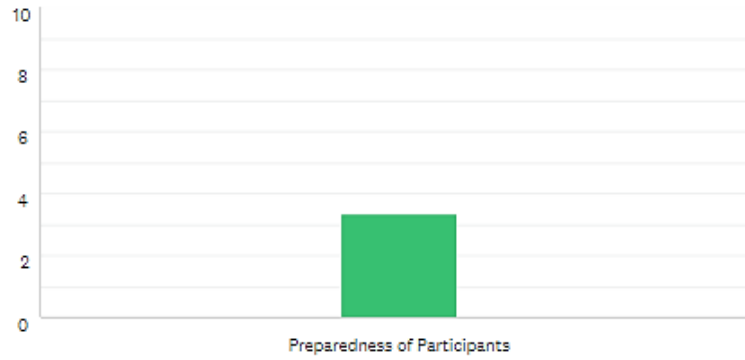
Answered: 14 Skipped: 14



	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
ETA	14.29% 2	14.29% 2	21.43% 3	14.29% 2	35.71% 5	14	3.43

**Q11:** Rate the overall preparedness of participants (e.g. had emergency backpack/supplies, knowledge of evacuation route, orderly) from 1 (poor) to 5 (excellent).

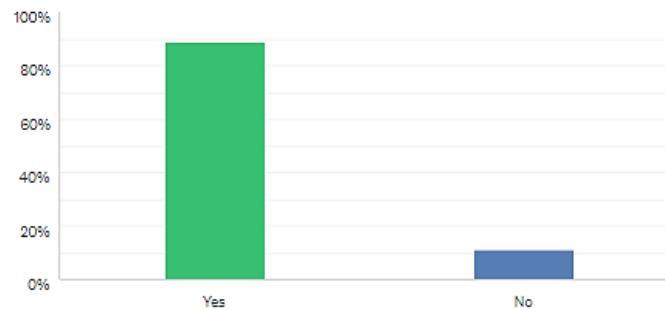
Answered: 14 Skipped: 14



	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
Preparedness of Participants	14.29% 2	7.14% 1	28.57% 4	28.57% 4	21.43% 3	14	3.36

**Q12: Does the TWFP/NTWC/NDMO have standard operating procedures in place for the receipt and dissemination of tsunami products?**

Answered: 27 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	88.89%	24
No	11.11%	3
TOTAL		27

**Comments:**

**Antigua and Barbuda:** Due for updating. According to Keithley Meade from the Antigua and Barbuda Met Services (TWFP), badly needs updating.

**Colombia:** Se tienen establecido el Protocolo Nacional de Deteccion y Alerta de Tsunami para las entidades que conforman el Sistema Nacional de Deteccion y Alerta de Tsunami SNDAT.

**Dominica:** Its not written

**Dominican Republic:** Protocol of Standard Procedures in Case of Tsunami between ISU-ONAMET-COE

**Nicaragua:** In Nicaragua we have standerized reponse plans which applied jointly by the municipal institutions, the National System of Attention and Disaster Prevention (SINAPRED), the Nicaraguan Institute of Territorial Studies (INETER) and UNESCO

**Puerto Rico:** The Bureau is in process of creating them by using the municipalities plans for starting point and also working with a state plan and response. PRSN as TWFP Alternate.

**Saint Lucia:** Mobile app, Radio broadcast interrupt capability and Multi Hazard sirens

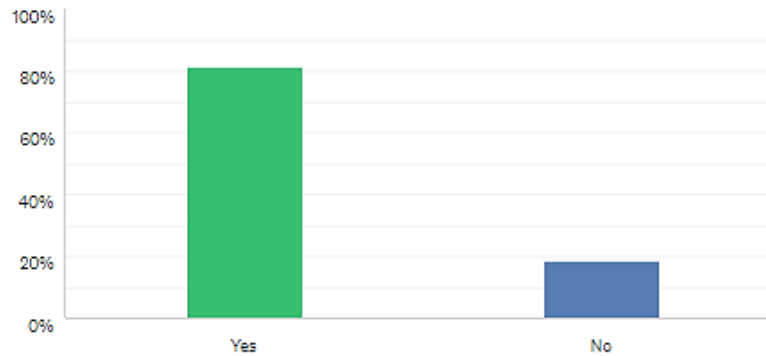
**Saint Vincent and the Grenadines:** St. Vincent and the Grenadines Tsunami Warning Protocol

**Trinidad and Tobago:** There is a National Tsunami Protocol which is in place and followed. However, it is still in draft. The TWFP and the NDMO liaise closely with respect to information flow and all aspects of the response to the threat.

**UK-Anguilla:** There is a National Tsunami Plan where by the TWFP received the messages and alerted the NDMO which then activated the Anguilla Warning System to disseminate warning messages.

**Q13:** Has TWFP/NTWC/NDMO undertaken activity to increase its capacity and capability to receive and disseminate tsunami products (e.g. training, exercise, etc.)? Note activities in comments section.

Answered: 27 Skipped: 1



ANSWER CHOICES	RESPONSES	
Yes	81.48%	22
No	18.52%	5
<b>TOTAL</b>		<b>27</b>

**Comments:**

**Antigua and Barbuda:** As a result we now know that they need to be reviewed and updated. According to Keithley Meade from the Antigua and Barbuda Met Services (TWFP), NTWC has commissioned a branch of the CDEMA early warning information system.

**Belize:** Activities are carried out mainly in the southern region of the country, headed by that respective regional coordinator who falls under the NEMO. Other awareness exercises include the dissemination of an updated Earthquake & Tsunami brochure at large public/community events across most of the country.

**Colombia:** Ejercicios semanales con los operadores, inducción y reinducción. Talleres de capacitación. Capacitaciones al equipo y delegados del Sistema Nacional de Gestión del Riesgo de Desastres sobre el protocolo Nacional y simulacros anteriores.

**Costa Rica:** Meetings and table works

**Dominican Republic:** There are annual trainings on the transmission of tsunami bulletins, generally from December until March of the other year for the Caribbean Wave.

**Guatemala:** We're working on a script that reads PTWC messages, takes relevant information for our region and distributes it to the corresponding agencies.

**Haiti:** A tabletop exercise

**Mexico:** Workshops, conferences, courses and training on tsunamis and exercises.

**Nicaragua:** In the Caribbean region of Nicaragua, this is the first time that the population has been involved in a tsunami exercise, SOP workshops, Tsunami Action Team workshops, training of teaching staff, community and religious leaders, people with disability associations'

representatives. All this enhanced the national, regional, municipal and local capabilities regarding Tsunami Early Warning. Additionally, the content of the training sessions were validated through simulation and drill exercises in Corn Island and Bluefields and planning participation in the exercise was excellent. In addition, the municipalities of Desembocadura del Río Grande and Laguna de Perla were integrated into the tsunami early warning training phase. It is important to note that CD SINAPRED has been working on strengthening response capacities to mutiamenaza including tsunami along the Caribbean coast of Nicaragua.

**NL-Sint Maarten:** The messages were disseminated via both email and whatsapp, which is commonly used.

**Saint Lucia:** Training in Tsunami Awareness

**UK-Anguilla:** Participation in the annual CaribeWave exercise, Visits to schools to promote earthquake and tsunami awareness

**UK-Bermuda:** Staff training - Tsunami Met Ed COMET module, SOP updates etc.

**UK-British Virgin Islands:** Presentations, Communication Demonstrations

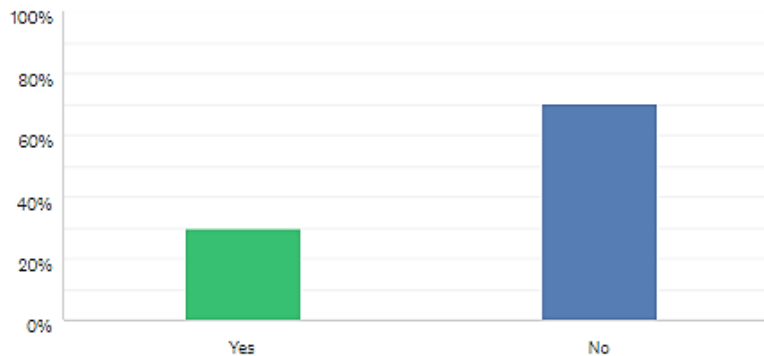
**UK-Cayman Islands:** Exercise

**UK-Turks and Caicos Island:** Evacuation exercise to more inland and higher areas

**USA-Puerto Rico:** The Bureau did information at conferences and training to the municipalities and government agencies. The PRSN undertook Table Top and Operational Exercise.

**Q14:** Did your Tsunami Warning Focal Point/NTWC run any tsunami numerical models during the exercise (e.g., deep-ocean propagation and/or coastal inundation models)?

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	29.63%	8
No	70.37%	19
<b>TOTAL</b>		<b>27</b>

**Comments:**

**Antigua and Barbuda:** Not for this exercise. According to Keithley Meade from the Antigua and Barbuda Met Services (TWFP), due mainly to lack of personnel and tools.

**Colombia:** ComMIT - TTT - TsuCAT - Tilde Tool

**Guatemala:** We used TsuCat to simulate the event. The results were acceptable for our region but not for others.

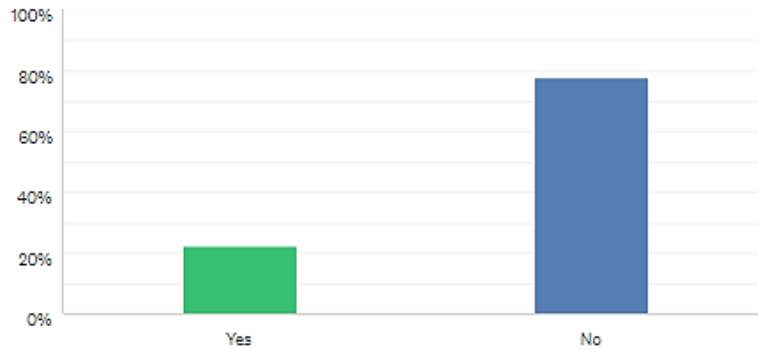
**Mexico:** We were employed TTT for ITIC/NOAA

**Nicaragua:** Within the framework of the CATAC (Central American Tsunami Warning Center) project, which is being developed in Nicaragua, we ran a scenario simulation and provided it to the member states of the Central American countries as a first experimental submission. Information was disseminated from two bulletins; the first with seismic data from the earthquake, and the second with wave arrival time parameters, maps and recommendations. Translated with [www.DeepL.com/Translator](http://www.DeepL.com/Translator)

**Venezuela:** Flood models by wave train arrives to the coastal areas of the country (FUNVISIS)

**Q15:** Did the Tsunami Warning Focal Point / National Tsunami Warning Center receive any message from an organization other than the PTWC (e.g., SRC, Volcano Observatory)? If yes, please use the comment box to indicate the agencies you received messages from.

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	22.22%	6
No	77.78%	21
TOTAL		27

**Comments:**

**Antigua & Barbuda:** Antigua and Barbuda Met office

**Colombia:** Se recibieron los boletines iniciales sobre los parámetros sísmicos del evento por parte del Servicio Geológico Colombiano. Por otro lado, se recibieron los Reportes Situaciones y Boletines Informativos por parte de la Unidad Nacional para la Gestión del Riesgo del Desastres. Por parte del Instituto de Hidrología, Meteorología y Estudios Ambientales, se recibieron los boletines del pronóstico de mareas para las próximas 24 horas.

**Costa Rica:** SINAMOT (National System Tsunami Warning)

**Dominican Republic:** the Seismic Network of Puerto Rico, but they managed another scenario (kick em Jenny).

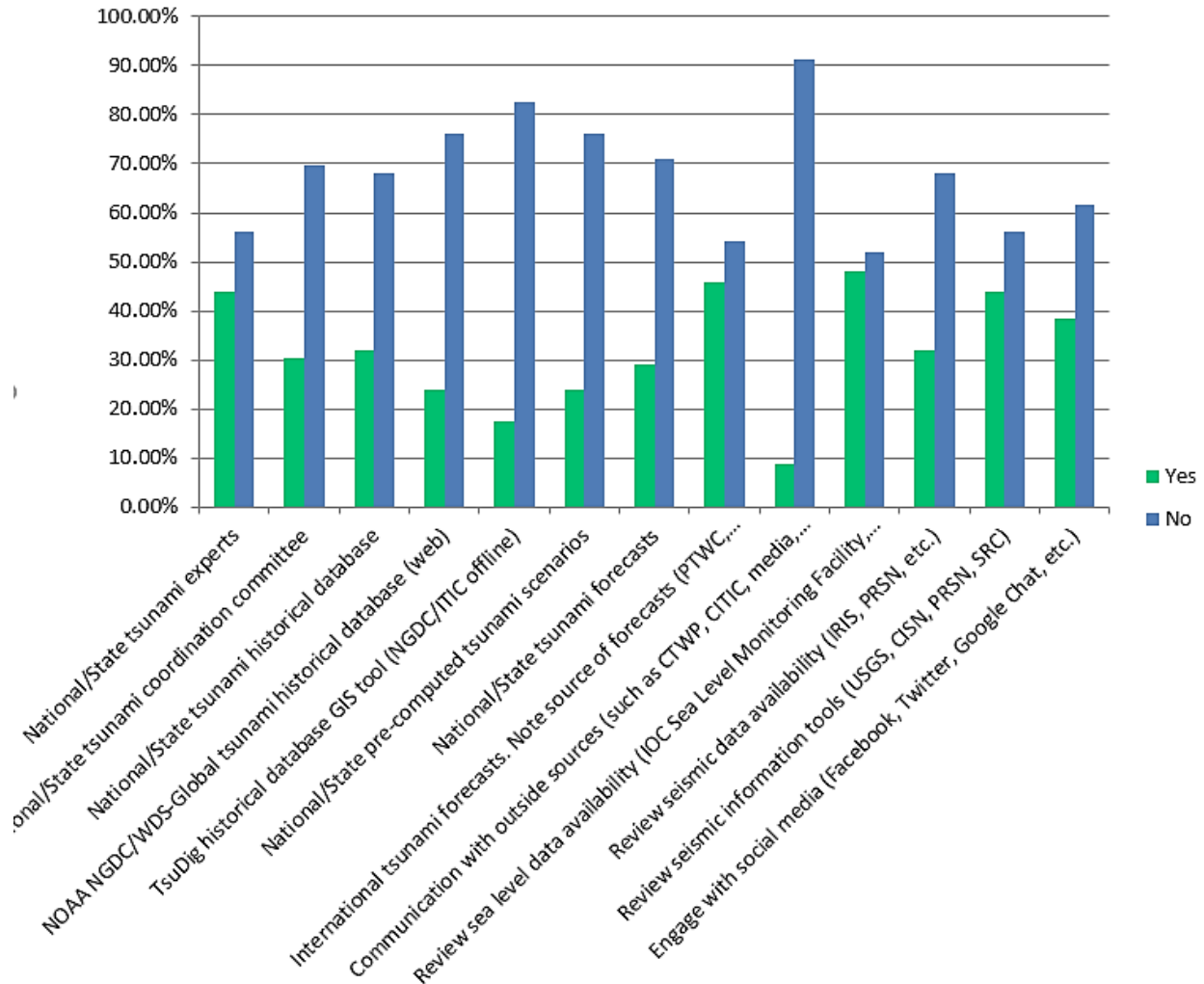
**Saint Lucia:** No message from SRC

**UK- British Virgin Islands:** Puerto Rico Seismic Network

**USA- Puerto Rico:** The PRSN commented: National Weather Service San Juan Office



**Q16:** Did your Country/Territory consult any of the following resources in order to better assess the tsunami threat during the exercise? Select from the following list.



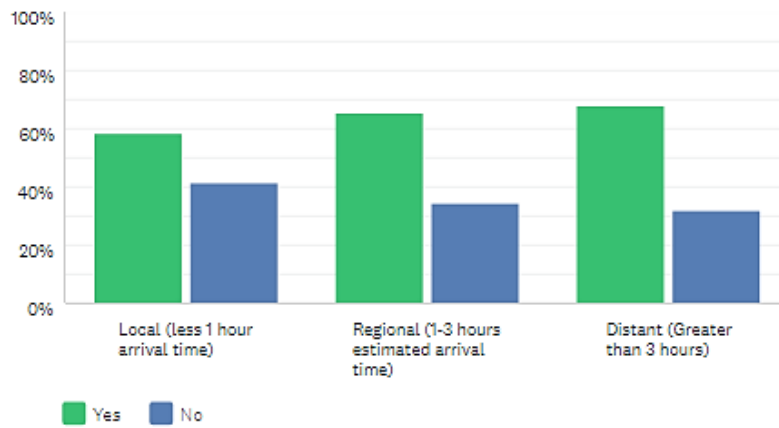
**Comments:**

**Antigua and Barbuda:** The exercise was focus on the national DRR system. According to Keithley Meade from the Antigua and Barbuda Met Services (TWFP), due mainly to lack of personnel and tools

**Trinidad and Tobago:** Note that, other than the injects from the PTWC the ODPM did not receive any other data/information.

**Q17: Does the country have a tsunami emergency response plan for tele/regional/local tsunami events?**

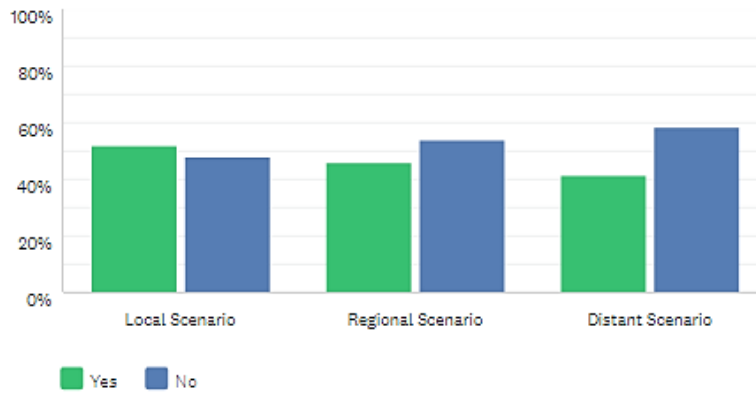
Answered: 26 Skipped: 3



	YES	NO	TOTAL
Local (less 1 hour arrival time)	58.33% 14	41.67% 10	24
Regional (1-3 hours estimated arrival time)	65.38% 17	34.62% 9	26
Distant (Greater than 3 hours)	68.00% 17	32.00% 8	25

**Q18: Are tsunami inundation maps available for your Country/Territory? Select from the following list.**

Answered: 27 Skipped: 2



	YES	NO	TOTAL
Local Scenario	52.00% 13	48.00% 12	25
Regional Scenario	45.83% 11	54.17% 13	24
Distant Scenario	41.67% 10	58.33% 14	24

**Comments:**

**Antigua and Barbuda:** Need validation

**Colombia:** Solo se tienen mapas de inundación disponibles para el Pacífico.

**Dominican Republic:** We have a general one created by global matrix a while ago.

**Guatemala:** We have one for a specific community in the Pacific coast.

**Saint Vincent and the Grenadines:** Mapping has commenced (In progress)

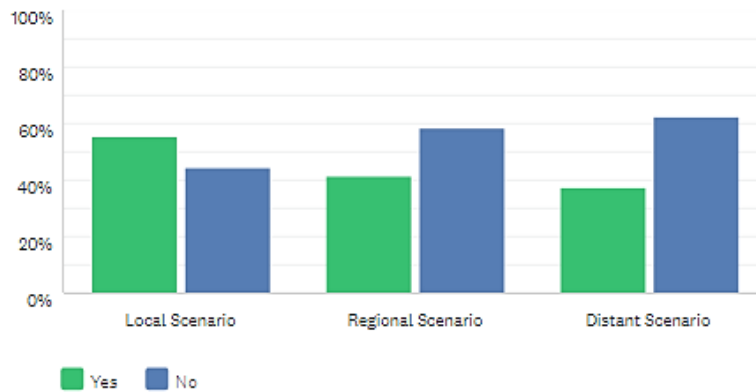
**Trinidad and Tobago:** Please note that these are only available for Tobago. There are none for Trinidad.

**UK- Anguilla:** One map is available. The map was developed without the use of bathymetric data and a new map should be developed to better reflect the actual impact of tsunamis.

**UK- Bermuda:** A rudimentary map is available (a sort of worse case scenario).

**Q19: Are tsunami evacuation maps available for your Country/Territory? Select from the following list.**

Answered: 27 Skipped: 2



	YES	NO	TOTAL	WEIGHTED AVERAGE
Local Scenario	55.56% 15	44.44% 12	27	1.44
Regional Scenario	41.67% 10	58.33% 14	24	1.88
Distant Scenario	37.50% 9	62.50% 15	24	1.63

**Comments:**

**Antigua & Barbuda:** To be validated.

**Colombia:** Solo se tienen mapas de evacuación disponibles para el Pacífico.

**Guatemala:** We have one for a specific community in the Pacific coast

**Grenada:** One Parish; St. Patrick (Certified Tsunami Ready 2018)

**NL- Sint Maarten:** Are made not approved yet

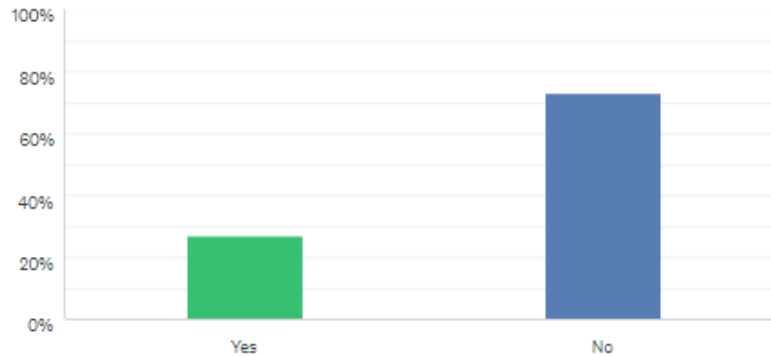
**Trinidad and Tobago:** Please note that these are only available for Tobago. There are none for Trinidad.

**UK- Anguilla:** Developed with the inundation map

**UK- Bermuda:** Not as such, only inundation map is available currently.

**Q20:** Does the country have a tsunami mass coastal evacuation plan?

Answered: 26 Skipped: 3



ANSWER CHOICES	RESPONSES
Yes	26.92% 7
No	73.08% 19
<b>TOTAL</b>	<b>26</b>

**Comments:**

**Antigua & Barbuda:** Is a work in progress.

**Dominican Republic:** Emergency Operations Center has it

**Mexico:** Does not have a massive coastal evacuation plan, due to the lack of coordination between institutions of the federal public administration and university to establish it.

**Nicaragua:** In addition to the Caribbean Wave and Pacific Wave exercises, government authorities through SINAPRED developing four multi hazard exercises in which the entire Nicaraguan population is involved.

**NL- Sint Maarten:** In the making not approved yet

**Saint Lucia:** The evacuation plan for the Castries Basin is completed. The evacuation plan for Canaries is in progress.

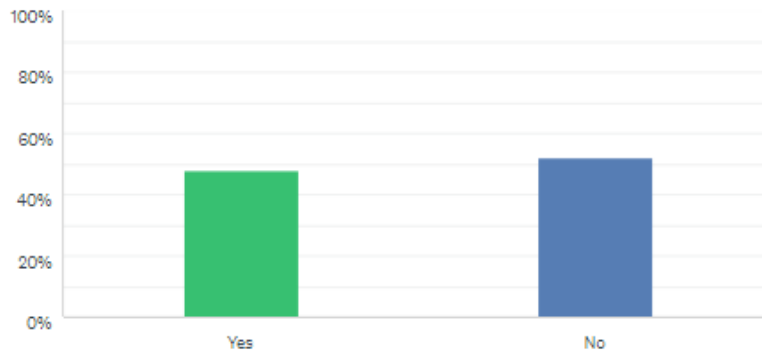
**Saint Vincent and the Grenadines:** Ongoing community sensitization and evacuation planning.

**UK- Anguilla:** The National Tsunami Plan does not explicitly address mass coastal evacuation beyond the need for warning and the need for evacuation

**USA- Puerto Rico:** The Bureau is in process and review. According to PRSN, we have one per coastal municipality (TsunamiReady Program).

**Q21: Does the response plan includes processes to issue Safe-to-Return (All-Clear)**

Answered: 25 Skipped: 4



ANSWER CHOICES	RESPONSES
Yes	48.00% 12
No	52.00% 13
TOTAL	25

**Comments:**

**Dominican Republic:** Emergency Operations Center has it

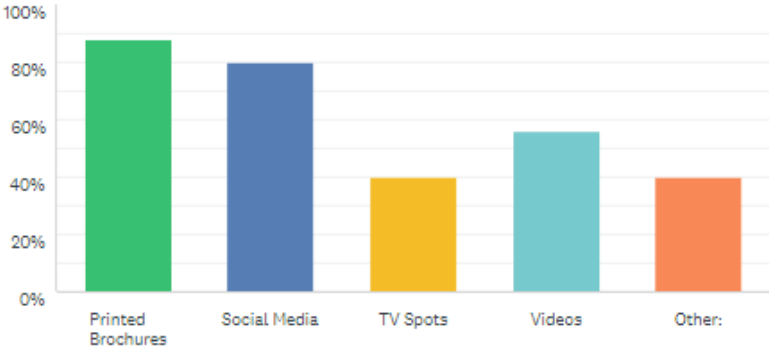
**Nicaragua:** Ineter, technical scientific institution of the Republic of Nicaragua is responsible for monitoring geological phenomena in the national territory and gives suggestions for activation and suspension of tsunami warning to the Presidency of the Republic which declares and/or suspends the tsunami warning, through SINAPRED.

**Venezuela:** The plan is in the process of being built with the participation of different institutions, however, it will have protocols to issue safe return notices.

**USA- Puerto Rico:** The actual response plan that was validated is used and it is being corrected this month. The information will come from authorities via different methods, radio, TV, social media, etc.

**Q22:** Have public education materials been developed and/or disseminated?

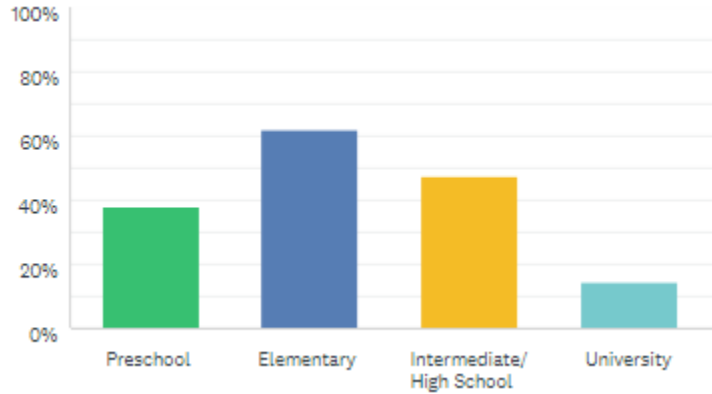
Answered: 25 Skipped: 4



ANSWER CHOICES	RESPONSES
Printed Brochures	88.00% 22
Social Media	80.00% 20
TV Spots	40.00% 10
Videos	56.00% 14
Other:	Responses 40.00% 10

**Q23: Are tsunami-related curriculum programmes in place for different levels of education?**

Answered: 21 Skipped: 8



ANSWER CHOICES	RESPONSES
Preschool	38.10% 8
Elementary	61.90% 13
Intermediate/High School	47.62% 10
University	14.29% 3
Comments:	Responses 52.38% 11
Total Respondents: 21	

**Comments:**

**Belize:** mainly in the southern region

**Colombia:** No se tienen en el país.

**Dominican Republic:** But they are not being implemented yet

**Grenada:** It is not apart of the curriculum

**Haiti:** In progress

**Mexico:** In the different educational levels it does not exist plans.

**NL- Curacao:** no

**Saint Vincent and the Grenadines:** No formalize curriculum

**Trinidad and Tobago:** Not at this time. The ODPM does however, participate and or conduct Tsunami talks in schools from time to time.

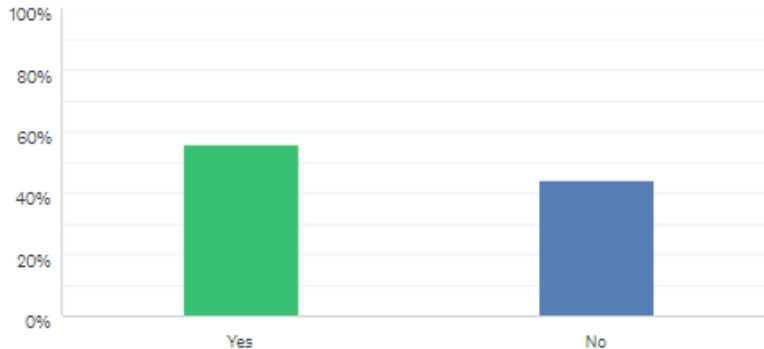
**UK- Bermuda:** No, not yet.

**UK- Cayman Islands:** Sort of - Hazard Management Cayman presents in all the schools and allschools are required to have plans in place for tsunamis and other threats.



**Q24:** Are there other preparedness/education tools and products utilized in your country/territory? Please list in comments section.

Answered: 25 Skipped: 4



ANSWER CHOICES	RESPONSES
Yes	56.00% 14
No	44.00% 11
TOTAL	25

**Comments:**

**Belize:** meetings held with community leaders, drills carried out once a year (in the south) at schools and selected communities, public awareness nearly every week (again in the south)

**Nicaragua:** A television program focused on disaster prevention has been developed in Nicaragua, including tsunamis.

**Saint Vincent and the Grenadines:** Tsunami related programs are done in schools and communities mainly during NEMO's Tsunami Awareness Month in March and for the rest of the year on an adhoc basis or on request.

**Trinidad and Tobago:** The Public Information and Education Community Outreach Unit provides information on Tsunamis in various public forums.

**UK- Anguilla:** Radio spots, community meetings

**UK- British Virgin Islands:** Exercise Walk to educate persons on the evacuation routes and zones

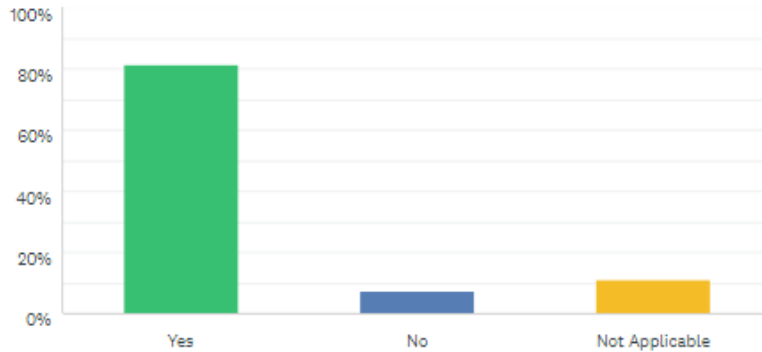
**UK- Cayman Islands:** presentations at events, Continuity of Operations plans for Government agencies - updated and submitted annually, business continuity training offered for private sector for free, we are starting to map areas of vulnerability and potential evacuation areas

**USA- Puerto Rico:** Personal presentation, PRSN Web resources, Education and Outreach Program in Earthquakes and Tsunamis.

**Venezuela:** table games

**Q25:** Was the response activation process followed when the simulated products from PTWC for Caribe Wave 19 Exercise were received?

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	81.48% 22
No	7.41% 2
Not Applicable	11.11% 3
<b>TOTAL</b>	<b>27</b>

**Comments:**

**Dominica:** The simulated products from PTWC for Caribe Wave 19 Exercise was received by st kitts partner.

**Dominican Republic:** We follow what is established in Protocol of Standard Procedures in case of tsunami.

**Nicaragua:** Once the simulated products from Caribe Wave were received, the sequence protocol mechanism was activated (activation through cancellation).

**Saint Lucia:** The products were received late therefore response activation was delayed and done

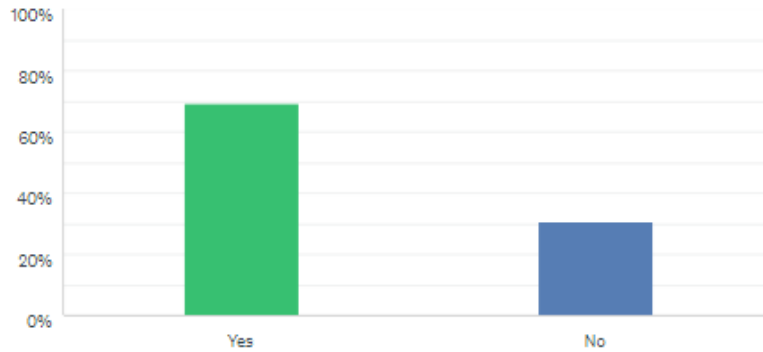
**Trinidad and Tobago:** All Emergency Support Functions and related agencies informed via telephone of the exercise. The Minister and senior officials of the Ministry of National Security were also informed.

**UK- Cayman Islands:** We used the exercise to bring together first responders to build plan familiarity, look at agency specific responses to the scenario, identify gaps, and generate actions for building capacity

**USA- Puerto Rico:** Activation of the PRSN Tsunami Protocol for Puerto Rico and Virgin Islands Region.

**Q26: Did the TWFP/NTWC prepare and issue messages to relevant in-country agencies for CARIBE WAVE 19?**

Answered: 26 Skipped: 3



ANSWER CHOICES	RESPONSES
Yes	69.23% 18
No	30.77% 8
TOTAL	26

**Comments:**

**Colombia:** Se emitieron los boletines de Alerta con las recomendaciones, pronósticos, tiempos estimados de arribo y observaciones de amplitud de la onda de Tsunami para las entidades que conforman el SNDAT y la UNGRD con base en los anteriores emitió los boletines oficiales a los Consejos Departamentales y Municipales de Gestión del Riesgo de Desastres, Cuerpos de Socorro y Fuerzas Militares.

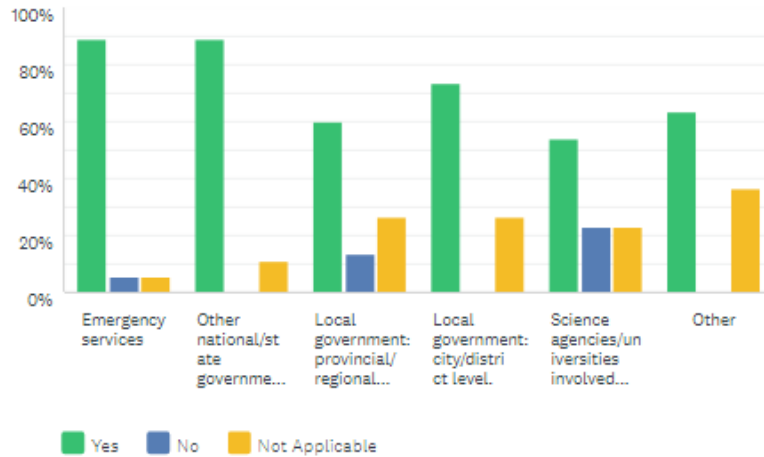
**Dominican Republic:** After the PTWC bulletins were received, Bulletins were issued to the authorities of the Emergency Operations Center.

**Saint Lucia:** Messages were sent to the Department of Education for evacuation of schools.

**UK- Anguilla:** Not done for this exercise.

**Q27: CARIBE WAVE 19 messages were issued to the following in-country agencies:**

Answered: 19 Skipped: 10



	YES	NO	NOT APPLICABLE	TOTAL
Emergency services	88.89% 16	5.56% 1	5.56% 1	18
Other national/state government agencies	88.89% 16	0.00% 0	11.11% 2	18
Local government: provincial/regional level	60.00% 9	13.33% 2	26.67% 4	15
Local government: city/district level	73.33% 11	0.00% 0	26.67% 4	15
Science agencies/universities involved in assessment	53.85% 7	23.08% 3	23.08% 3	13
Other	63.64% 7	0.00% 0	36.36% 4	11

**Comments:**

**Antigua & Barbuda:** These will be answered by NTWC.

**Dominican Republic:** We only issue Alert or Tsunami Warning to the Emergency Operations Center.

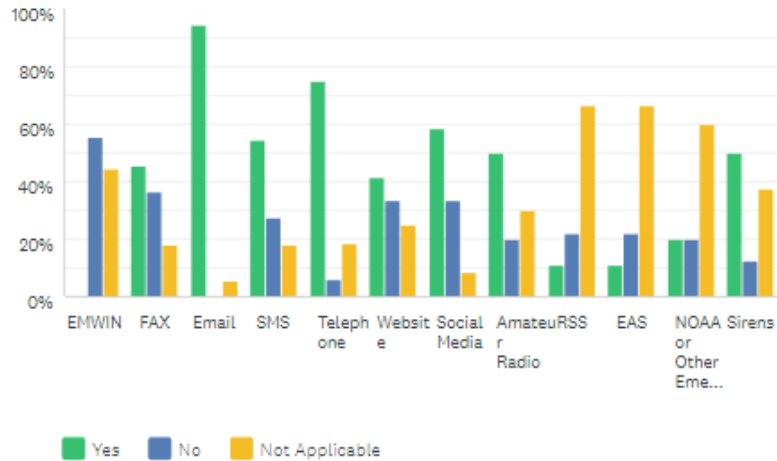
**Nicaragua:** The different churches also participated.

**Saint Lucia:** Police, National Disaster Office, Fire and Ministry of Education.

**UK- Cayman Islands:** The Joint Communications Service Emergency Support Team of the National Emergency Operations Centre.

**Q28: What methods were used by the TWFP/NTWC/NDMO to disseminate the CARIBE WAVE 19 messages to in-country agencies?**

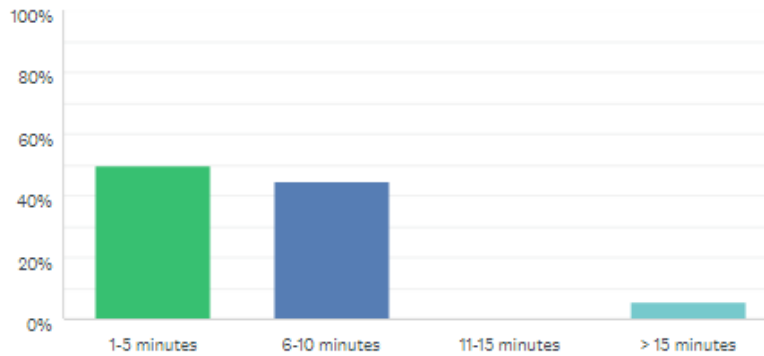
Answered: 19 Skipped: 10



	YES	NO	NOT APPLICABLE	TOTAL
EMWIN	0.00% 0	55.56% 6	44.44% 4	9
FAX	45.45% 6	36.36% 4	18.18% 2	11
Email	94.74% 18	0.00% 0	5.26% 1	19
SMS	54.55% 6	27.27% 3	18.18% 2	11
Telephone	75.00% 12	6.25% 1	18.75% 3	16
Website	41.67% 6	33.33% 4	25.00% 3	12
Social Media	58.33% 7	33.33% 4	8.33% 1	12
Amateur Radio	50.00% 5	20.00% 2	30.00% 3	10
RSS	11.11% 1	22.22% 2	66.67% 6	9
EAS	11.11% 1	22.22% 2	66.67% 6	9
NOAA or Other Emergency Alert Radio	20.00% 2	20.00% 2	60.00% 6	10
Sirens	50.00% 4	12.50% 1	37.50% 3	8

**Q29:** How soon after start of exercise were the CARIBE WAVE 19 messages sent from TWFP/NTWC to the corresponding agency or agencies (listed above)?

Answered: 18 Skipped: 11



ANSWER CHOICES	RESPONSES
1-5 minutes	50.00% 9
6-10 minutes	44.44% 8
11-15 minutes	0.00% 0
> 15 minutes	5.56% 1
<b>TOTAL</b>	<b>18</b>

**Comments:**

**Barbados:** The messages were disseminated by the amateur radios, followed by e-mail then the fax.

**Colombia:** El primer Boletín emitido por DIMAR se envió a las 1408 UTC.

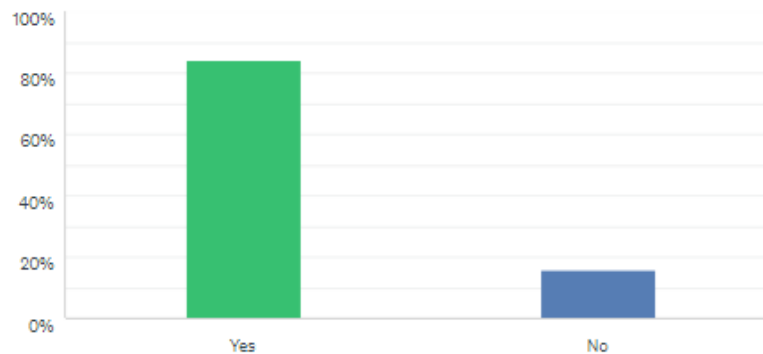
**Mexico:** The massive electronic distribution media used (email) has a limit of limited recipients.

**NL- Bonaire, Saba, Sint Eustatius:** For the e-mails. However, telephone calls took 30 minutes (people not answering or in meetings).

**Saint Lucia:** The first message came at 10:00am, second at 10:05am, third message came at 10:30am

**Q30:** Based on feedback from agencies were the communication methods timely and appropriate?

Answered: 19 Skipped: 10



ANSWER CHOICES	RESPONSES
Yes	84.21% 16
No	15.79% 3
TOTAL	19

**Comments:**

**Colombia:** Se realizaron comunicaciones por vía mail, teléfono, celular, WhatsApp, radio VHF. Sin embargo se recalca la necesidad de utilizar medios alternativos de comunicación como el FAX y el Radio. Se identificaron algunas fallas en la comunicación con las autoridades locales, asociados a la disponibilidad de internet.

**Guatemala:** We decided to send messages every hour, instead of sending them each time a message from PTWC was received. This caused some confusion.

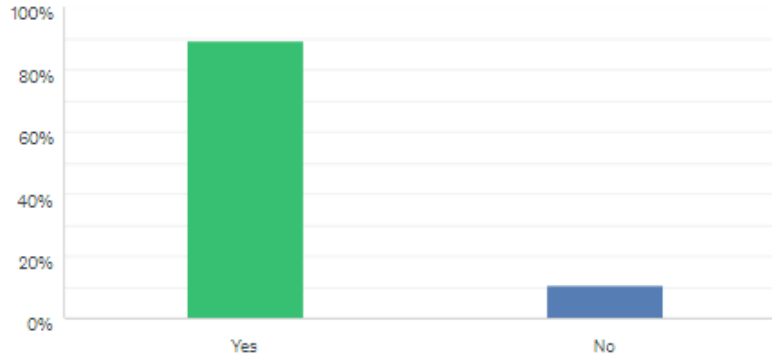
**NL- Sint Maarten:** Fast response for whatsapp, for email was less timely.

**Saint Lucia:** Communication was delayed. The estimated wave time was 1022 but message came at 10:30am.

**UK- Turks and Caicos Islands:** Did not receive any message.

**Q31:** Based on feedback from agencies was the message(s) disseminated from TWFP/NTWC/NDMO accurate and clear?

Answered: 19 Skipped: 10



ANSWER CHOICES	RESPONSES	
Yes	89.47%	17
No	10.53%	2
<b>TOTAL</b>		<b>19</b>

**Comments:**

**Colombia:** Adicionalmente se recibieron recomendaciones por parte de las entidades del SNDAT, para que los boletines fueran más fáciles de interpretar por los técnicos de las entidades.

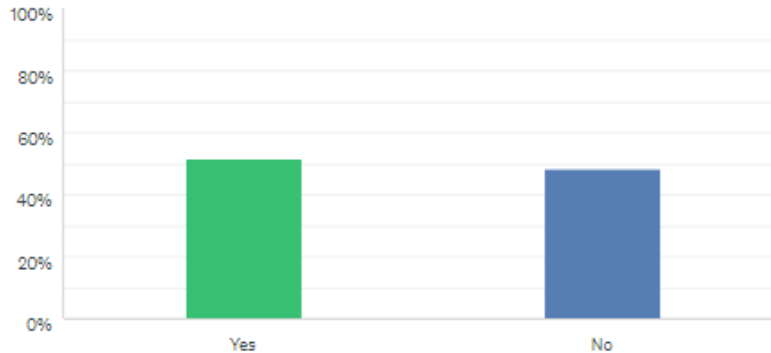
**Guatemala:** Some typos were corrected on the go.

**UK- Turks and Caicos Islands:** Did not receive any message



**Q32: Was your Country's/Territory's Emergency Operations Center activated during the exercise?**

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	51.85% 14
No	48.15% 13
TOTAL	27

**Comments:**

**Colombia:** Se activo la Sala de Crisis a nivel nacional, así mismo, a se activo en los departamentos y algunos municipios del Caribe Colombiano.

**Nicaragua:** The Emergency Operations Center in Bluefields, Corn Island and El Bluff were activated.

**Trinidad and Tobago:** Virtual activation only.

**UK- Cayman Islands:** Partially

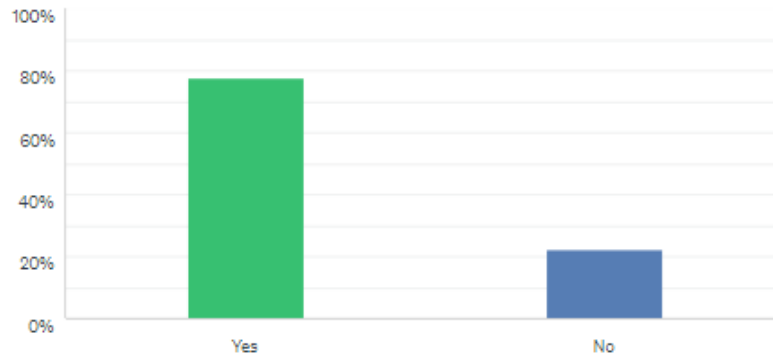
**UK- Turks and Caicos Islands:** Did not receive any message

**USA- Puerto Rico:** It was activated in a partial manner. According to the PRSN, the University of Puerto Rico Mayaguez Campus activated the EOC at 10:05AM.

**Venezuela:** VEN 911

**Q33:** Did the National Disaster Management Organization (or equivalent) maintain communication with the TWFP/NTWC throughout the exercise?

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	77.78%	21
No	22.22%	6
TOTAL		27

**Comments:**

**Colombia:** Se mantuvo comunicación constante con las entidades del SNDAT por correo electrónico, por celular y por un grupo de Whatsapp temporal creado durante el ejercicio.

**Dominican Republic:** we call by phone explaining the content of each newsletter and asking who received it.

**Mexico:** During the exercise, communication was held with the Centro Nacional de Prevencion de Desastres (CENAPRED).

**Nicaragua:** During the whole exercise we had constant communication through radio communication and telephones.

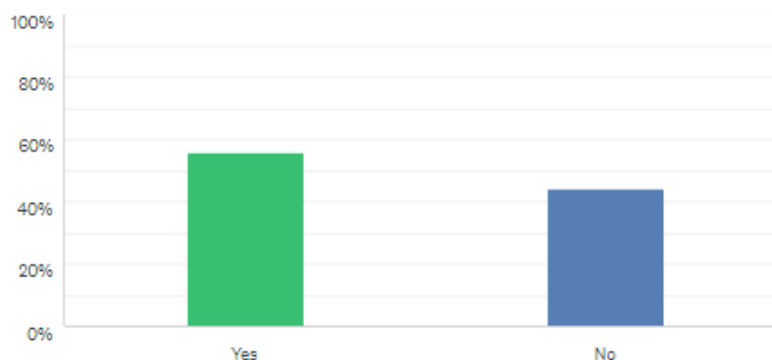
**Trinidad and Tobago:** Yes. The TWFP and the NTWC (The National Emergency Operations Centre) communicated via phone after every new inject.

**UK- Turks and Caicos Islands:** Did not receive any message

**USA- Puerto Rico:** PRSN maintained communications with PREMA (PR), VITEMA (USVI) and DDM (BVI).

**Q34:** Did the National Disaster Management Organization (or equivalent) maintain communication with local/regional disaster management organizations (or equivalent)?

Answered: 25 Skipped: 4



ANSWER CHOICES	RESPONSES	
Yes	56.00%	14
No	44.00%	11
<b>TOTAL</b>		<b>25</b>

**Comments:**

**Colombia:** De forma permanente, por videoconferencia, teléfono y correo electrónico.

**Nicaragua:** During the whole exercise they had constant communication through radio communication and telephones.

**Trinidad and Tobago:** To a limited extent due to the scaled back nature of our exercise. We did exercise the Trinidad and Tobago Coast Guard to some extent.

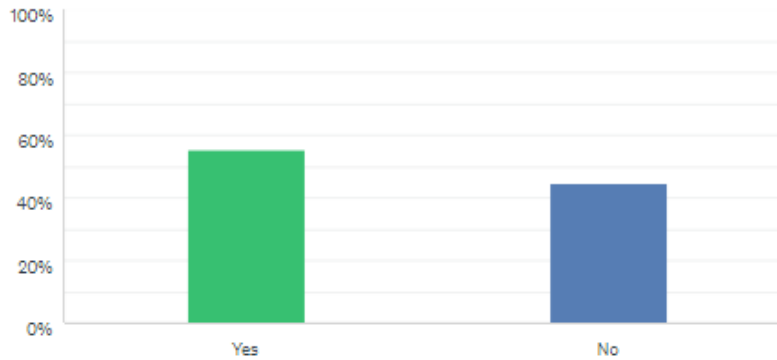
**UK- Bermuda:** National is local/regional for Bermuda!

**UK- Cayman Islands:** Not Applicable

**UK- Turks and Caicos Islands:** Did not receive any message

**Q35: Was a tsunami warning and/or information issued to the public as part of the CARIBE WAVE 19 Exercise?**

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	55.56%	15
No	44.44%	12
<b>TOTAL</b>		<b>27</b>

**Comments:**

**Barbados:** Selected entities that were involved in the exercise were issued a tsunami warning.

**Colombia:** Sin embargo en algunas poblaciones se realizaron evacuaciones con la participación de público general.

**Nicaragua:** In the municipalities of Bluefields, Corn Island and El Bluff.

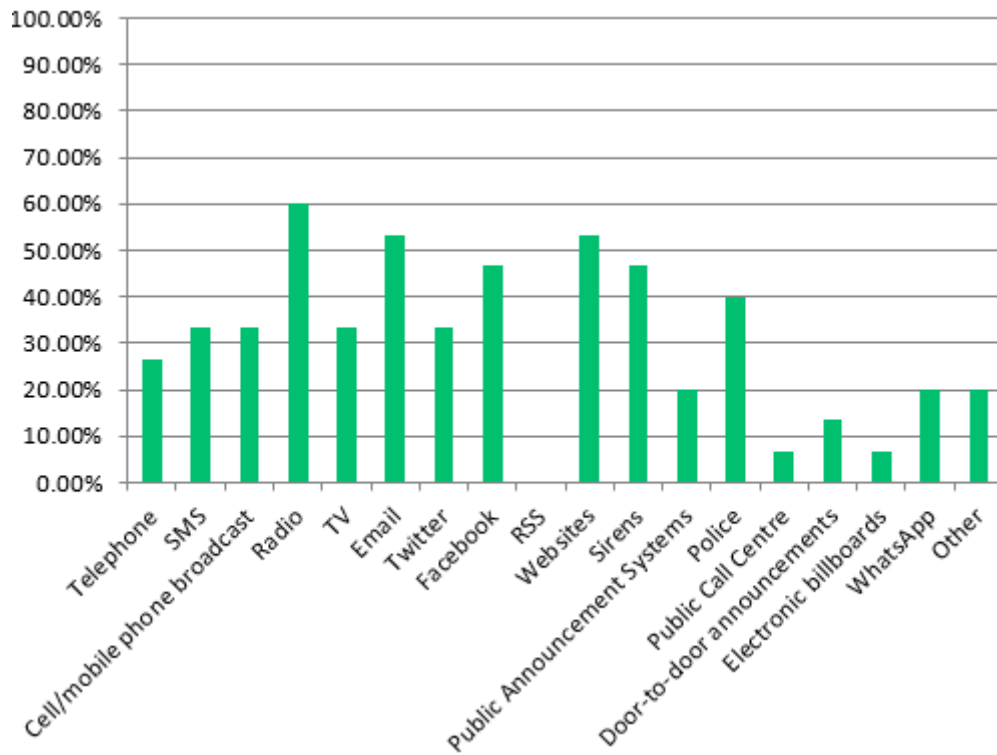
**Saint Lucia:** The Multi Hazard siren was tested, broadcast interrupt was also tested, mobile app was also tested

**UK- Bermuda:** Tsunami Watch was issued

**UK- Turks and Caicos Islands:** Did not receive any message

**USA- Puerto Rico:** 6 Tsunami Bulletins starting at 10:05 AM with Information Statement, 10:30 AM (14:30 UTC) Tsunami Warning, a Tsunami Advisory starting at 11:00 AM (15:00 UTC) and a Cancellation at 12:30 PM (16:30 UTC).

**Q36:** How was the warning/information communicated to the public? Please check all that apply:



**Comments:**

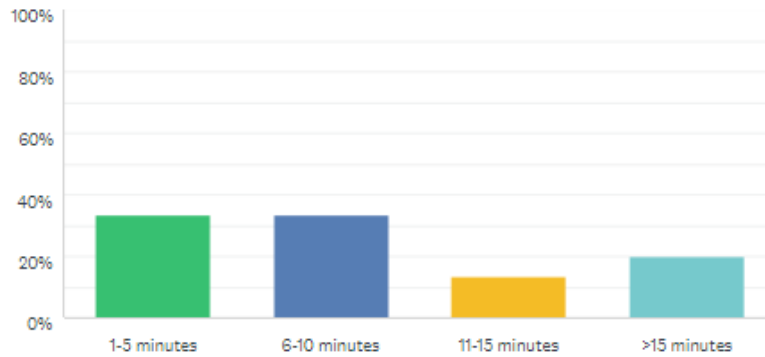
**France:** announcement by helicopter

**Nicaragua:** wo sirens acustic in Corn Island, were activates.

**USA- Puerto Rico:** According to PRSN, EAS - NWS-SJFO, WEA - PREMA, and NOAA Radio - NWS-SJFO

**Q37: How fast was the tsunami warning and/or information issued to the public?**

Answered: 15 Skipped: 14



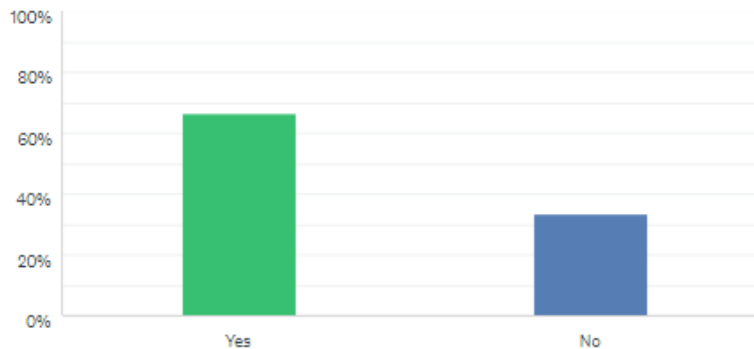
ANSWER CHOICES	RESPONSES
▼ 1-5 minutes	33.33% 5
▼ 6-10 minutes	33.33% 5
▼ 11-15 minutes	13.33% 2
▼ >15 minutes	20.00% 3
TOTAL	15

**Comments:**

**Nicaragua:** In agreement with the activation protocol.

**Q38:** In addition to the NTWC/TWFP/NDMO, did other government and private sector groups participate? If yes, please list these in the comments section.

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	66.67% 18
No	33.33% 9
<b>TOTAL</b>	<b>27</b>

**Comments:**

**Antigua & Barbuda:** NGO's, Chamber of commerce, Police, Military, utility company, etc.

**Barbados:** National Conservation Commission, Atlantis Submarines

**Colombia:** Capitanías de Puerto, Estaciones de Control Trafico Marítimo y Centro de Investigaciones Oceanográficas e Hidrográficas del Caribe. Armada Nacional, Estación Guardacostas.

**Costa Rica:** Local emergency committes, Tourism otrganization, National park staff

**Dominican Republic:** the people who registered the tsunamizone.org

**Grenada:** six other Private and Government entities participated

**Haiti:** PADF, AGERCA, GOAL , some Universities

**Mexico:** Only the institutions that compose the Sistema Nacional de Alerta de Tsunamis participated.

**Nicaragua:** National Police, Civil Protection, EPN, DGA, PETRONIC, DGBN, ENEL, Naval Force, City Hall, MARENA, MINSA, INAFOR, MEFCCA, NRC, EAAI, MINED, Migration and Foreign affairs, FECONORI, URACCAN, BICU, Religious Ministers' Association, Guardabarranco

**NL- Sint Maarten:** E.O.C. and advisors to th E.O.C.

**Saint Vincent and the Grenadines:** Calliaqua Anglican School

**Trinidad and Tobago:** None other than stated before.

**UK- Anguilla:** Some Critical Facilities including the fuel companies and some tourism properties (hotels)

**UK- Bermuda:** Renaissance Re (reinsurance company) and one (x1) individual family.

**UK- British Virgin Islands:** Private School-Cedar School, Private Companies- Ogier Trust, Day Care - Little Lite House

**UK- Cayman Islands:** Fire Service, Police Service, Port Authority, Department of Tourism, Department of Public Safety Communications, Health Services Authority

**UK- Turks and Caicos Islands:** Did not receive any message

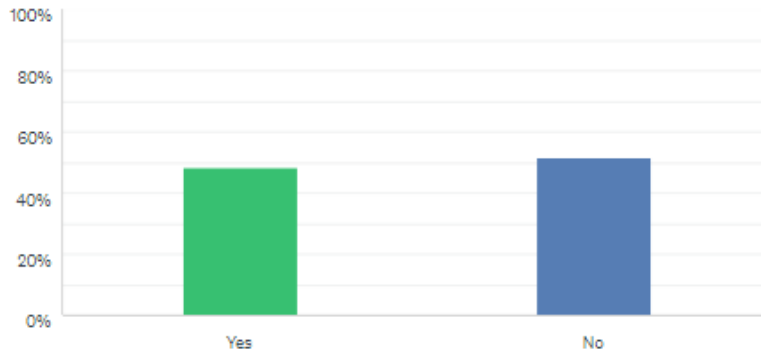
**USA- Puerto Rico:** Fire, EMS, Police, Health Department, Housing and Family Department, Education Department, and communities. PRSN added UPR, PREMA, NWA-SJFO, DDM, VITEMA, PREMA Regional Offices, Emergency Management Municipality Offices, 911 St. Thomas, 911 St. Croix, and BVI Police

**Venezuela:** small and medium private companies



**Q39: Is your country implementing the Community Performance Based Tsunami Recognition Program (TsunamiReady® or Tsunami Ready)?**

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	48.15%	13
No	51.85%	14
TOTAL		27

**Comments:**

**Antigua & Barbuda:** We have indicated an interest

**Costa Rica:** In Ostional, Guanacaste, Pacific Coast

**Dominican Republic:** We have made an effort, but we still do not have

**Guatemala:** That's why we have an inundation map, but we didn't make it ourselves

**Nicaragua:** We are starting in the municipalities of Corn Island and Bluefield this year, expanding into other municipalities in the near future.

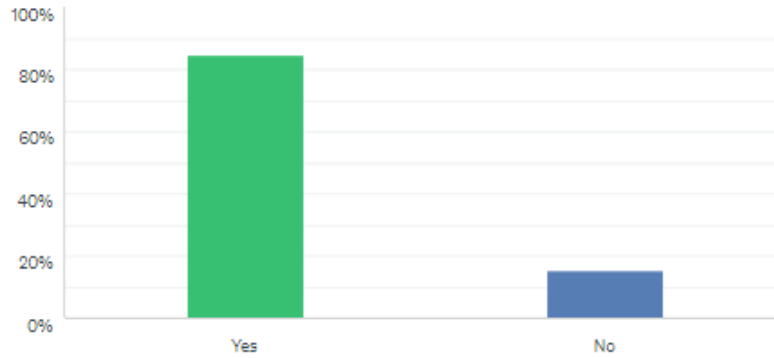
**UK- Anguilla:** Anguilla had been certified TsunamiReady in 2011

**UK- Cayman Islands:** Vaguely - Grand Cayman is a small Islands and the average height above sea level is 7 feet (just over 2 metres). Producing evacuation plans according to the Tsunami Ready Program is not feasible - we are trying to identify strong elevated structures to serve as evacuation locations

**UK- Turks and Caicos Islands:** Not as yet

**Q40:** Is your country interested in implementing the Community Performance Based Tsunami Recognition Program (TsunamiReady® or Tsunami Ready)?

Answered: 13 Skipped: 16



ANSWER CHOICES	RESPONSES
Yes	84.62% 11
No	15.38% 2
<b>TOTAL</b>	<b>13</b>

**Comments:**

**NL- Bonaire, Saba, Sint Eustatius:** Not sure

**UK- Bermuda:** Bermuda Weather Service is, but we have no buy in from the local EMO/Government.

**UK- Cayman Islands:** Maybe

**Q41:** How many communities in your country have already been designated as TsunamiReady® or Tsunami Ready?

**Q42:** What is the target number of Tsunami Ready communities (including communities which have been recognized) in your country/territory are targeted for TsunamiReady® or Tsunami Ready recognition?

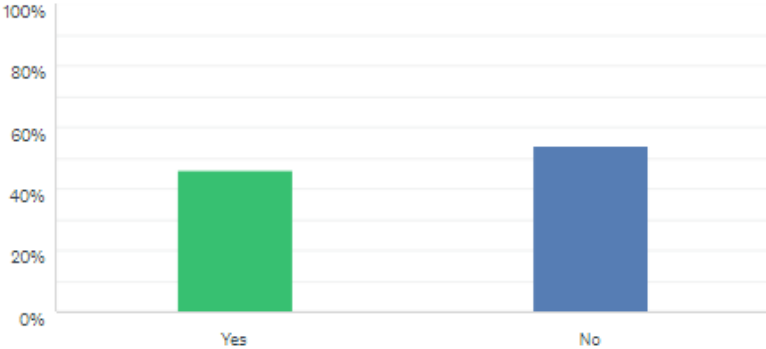
Country	Already Implementing	Interested in Implementing	TsunamiReady® or Tsunami Ready Communities	Target Number
Antigua and Barbuda	No	Yes	-	-
Bahamas	-	-	-	-
Barbados	Yes	-	2	10
Belize	No	Yes	-	-
Brazil	-	-	-	-
Colombia	No	No	-	-
Costa Rica	Yes	-	2	4
Cuba	-	-	-	-
Dominica	Yes	-	0	4
Dominican Republic	No	Yes	-	-
France (Martinique, Guadeloupe, St. Barthelemy, St. Martin)	No	Yes	-	-
Grenada	Yes	-	2	7
Guatemala	Yes	-	0	1

Guyana	No	Yes	-	-
Haiti	Yes	-	2	9
Honduras	-	-	-	-
Jamaica	-	-	-	-
Mexico	No	Yes	-	-
Netherlands (Bonaire, Saba and Sint Eustatius)	No	-	0	-
Netherlands (Curaçao)	No	Yes	-	-
Netherlands (Sint Maarten)	Yes	-	0	1
Nicaragua	Yes	-	0	10
Panama	-	-	-	-
Saint Kitts and Nevis	-	-	-	-
Saint Lucia	No	Yes	-	-
Saint Vincent and the Grenadines	Yes	-	0	5
Suriname	-	-	-	-

Trinidad and Tobago	Yes	-	0	15
United Kingdom of Great Britain & Northern Island (Anguilla)	Yes	-	4	4
United Kingdom of Great Britain & Northern Island (Bermuda)	No	Yes	-	-
United Kingdom of Great Britain & Northern Island (British Virgin Islands)	Yes	-	0	2
United Kingdom of Great Britain & Northern Island (Cayman Islands)	No	No	-	-
United Kingdom of Great Britain & Northern Island (Turks and Caicos)	No	Yes	-	-

**Q43:** Did you use KemJ scenario for CARIBE WAVE 19 Exercise?

Answered: 26 Skipped: 3



ANSWER CHOICES	RESPONSES
Yes	46.15% 12
No	53.85% 14
TOTAL	26

**Q44:** Rate the text message issued by PTWC on its usefulness in decision making from 1 (poor) to 5 (excellent).

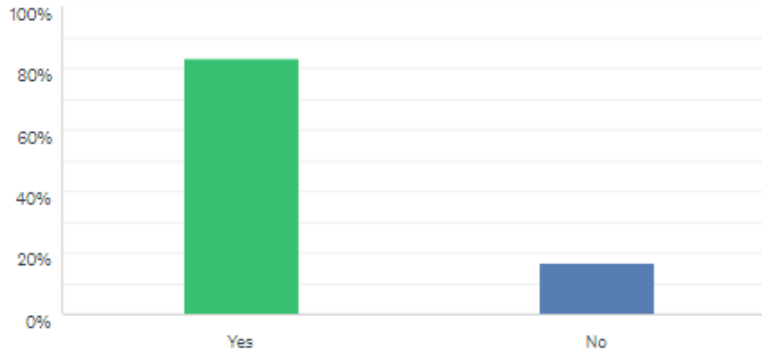
Answered: 12 Skipped: 17



	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
Text Message	0.00% 0	16.67% 2	33.33% 4	25.00% 3	25.00% 3	12	3.58

**Q45:** Did the test Kick 'em Jenny products contain all the information required for national/local decision making? Please provide comments and suggestions on how to improve.

Answered: 12 Skipped: 17



ANSWER CHOICES	RESPONSES
Yes	83.33% 10
No	16.67% 2
TOTAL	12

**Comments:**

**Antigua and Barbuda:** Because of what we did it was more than enough.

**France:** we received only one message

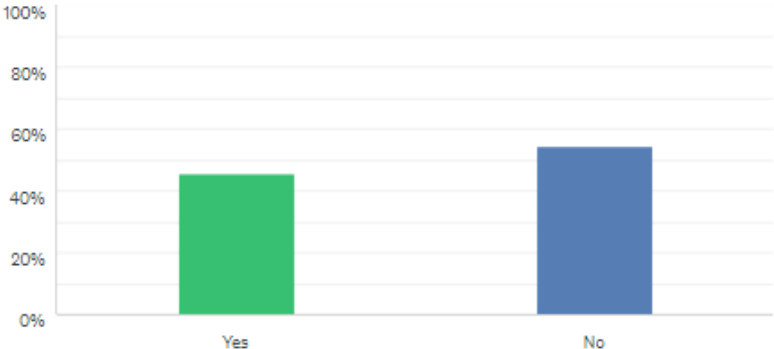
**USA- Puerto Rico:** Think will need a little more information at the final products. The PRSN received the PTWC Products but did not notice the volcanic information since they went directly to the Sections: Audience, Update, Earthquake Parameters and Tsunami Activity.

**Venezuela:** It was not as complete as that of the Panama stage



**Q46:** Were regional in-country event information/data (seismic data, GPS, sea level, volcanic, etc.) utilized to complement the PTWC exercise messages?

Answered: 11 Skipped: 18



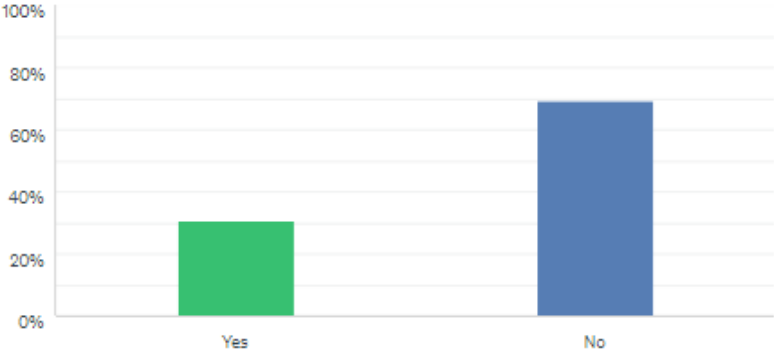
ANSWER CHOICES	RESPONSES
Yes	45.45% 5
No	54.55% 6
TOTAL	11

**Comments:**

**Saint Vincent and the Grenadines:** Local knowledge as 'Kick 'em Jenny' is closer to one of our Grenadine Island

**Q47:** Was additional in-country expert consultation utilized for analyzing the PTWC exercise messages?

Answered: 13 Skipped: 16



ANSWER CHOICES	RESPONSES
Yes	30.77% 4
No	69.23% 9
TOTAL	13

**Comments:**

**France:** meteo france

**USA- Puerto Rico:** At PRSN, Lizzette Rodriguez Iglesias, Volcanologist and Director Department of Gology UPRM

**Q48:** What was the reaction of authorities/media and public to the KemJ exercise? If other, please specify in the comments.

Answered: 13 Skipped: 16



ANSWER CHOICES	RESPONSES
Interest	92.31% 12
Fear	7.69% 1
No reaction	0.00% 0
Other	0.00% 0
<b>TOTAL</b>	<b>13</b>

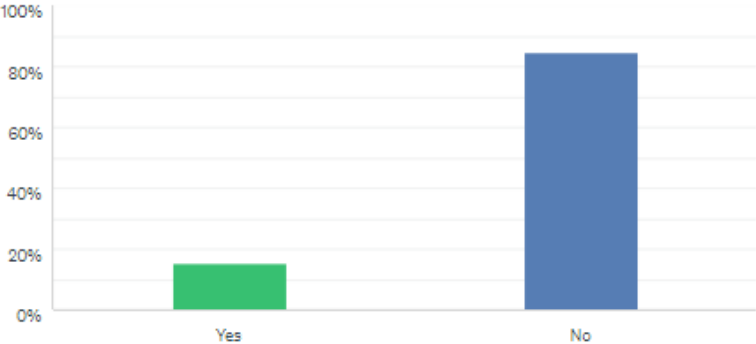
**Comments:**

**Saint Vincent and the Grenadines:** Some students during the exercise were very fearful and thought it was real.

**USA- Puerto Rico:** Interest, Fear, and other: most of the participant were confused due to doubting whether the scenario were to be a possible threat to Puerto Rico. According to the PRSN, there was a concern between participants related to the correct way of the Tsunami Warning System activation because normally with a < 6.0 magnitude event there is no Tsunami protocol activation or follow-up. We recommend that for the upcoming exercise other volcanic scenarios, like Montserrat, were considered.

**Q49:** Did the Tsunami Warning Focal Point / National Tsunami Warning Center receive any message from an organization other than the PTWC (e.g., SRC, Volcano Observatory)? If yes, please use the comment box to indicate the agencies you received messages from.

Answered: 13 Skipped: 16



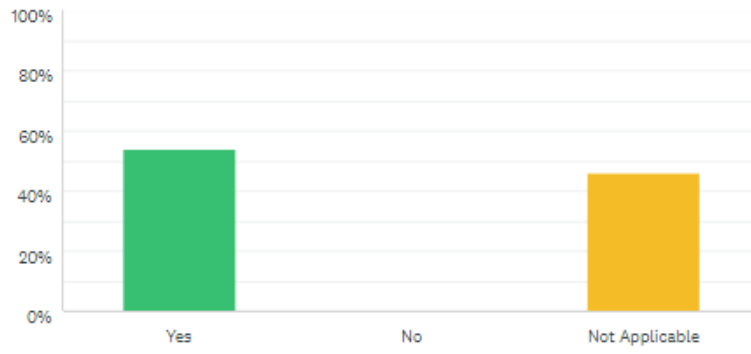
ANSWER CHOICES	RESPONSES
Yes	15.38% 2
No	84.62% 11
TOTAL	13

**Comments:**

**USA- Puerto Rico:** PRSN checked the SRC WebPage and found nothing on the Caribe Wave Exercise

### Q50: Were these products useful?

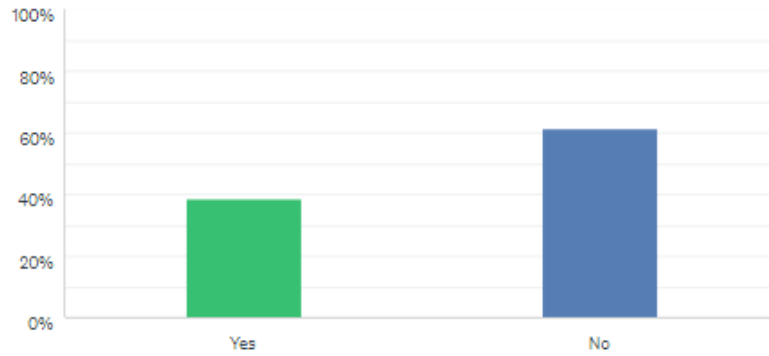
Answered: 13 Skipped: 16



ANSWER CHOICES	RESPONSES	
▼ Yes	53.85%	7
▼ No	0.00%	0
▼ Not Applicable	46.15%	6
<b>TOTAL</b>		<b>13</b>

**Q51: Does your country have a tsunami response plan for volcanic events?**

Answered: 13 Skipped: 16



ANSWER CHOICES	RESPONSES
Yes	38.46% 5
No	61.54% 8
TOTAL	13

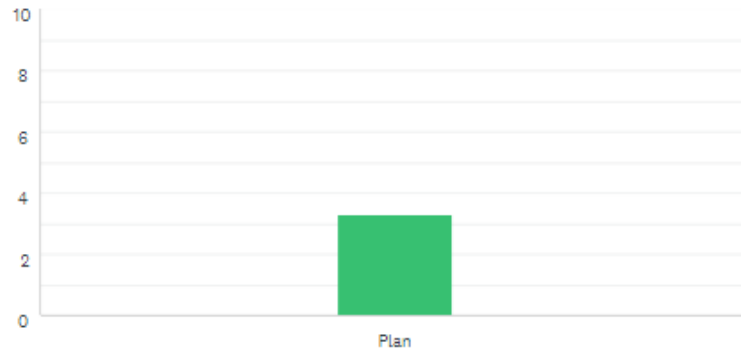
**Comments:**

**Saint Vincent and the Grenadines:** Only from earthquake source but not related to volcano

**USA- Puerto Rico:** In procces as the Tsuanmi plan from earthquakes

**Q52: How effective is the plan from 1 (poor) to 5 (excellent)?**

Answered: 11 Skipped: 18



	1	2	3	4	5	N/A	TOTAL	WEIGHTED AVERAGE
Plan	0.00% 0	0.00% 0	45.45% 5	18.18% 2	0.00% 0	36.36% 4	11	3.29

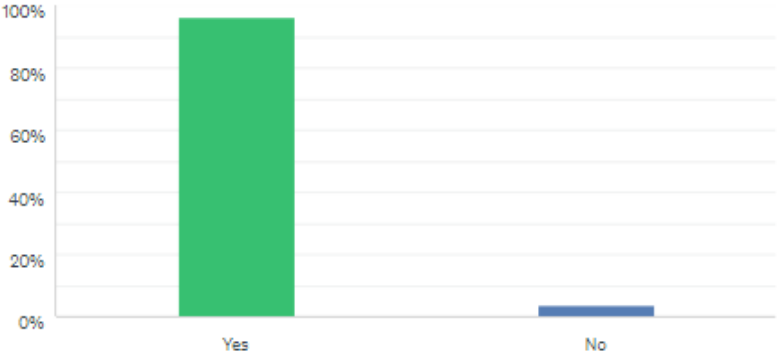
**Comments:**

**Dominica:** no plan

**USA- Puerto Rico:** Using the municipalities plan

**Q53:** Through participating in the CARIBE WAVE 19 Exercise, is there a better understanding of the agencies in the Country/Territory (TNC/TWFP/NDMO) of their responsibilities and roles in tsunami emergencies?

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	96.30% 26
No	3.70% 1
<b>TOTAL</b>	<b>27</b>

**Comments:**

**Colombia:** Fue una oportunidad para socializar el fenómeno con las autoridades locales. Sirvió para probar el protocolo de Comunicaciones e identificación de falencias.

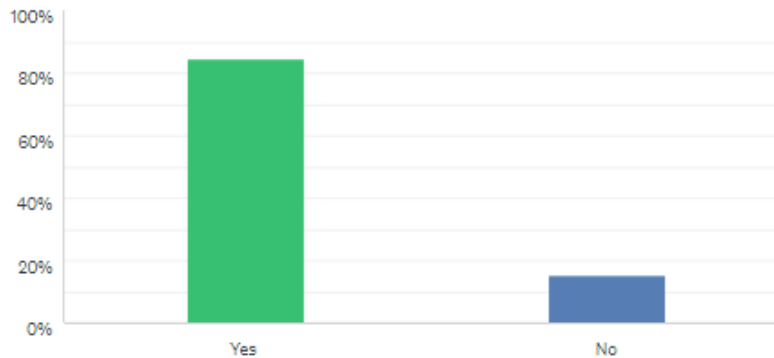
**Guatemala:** This is the first time we work with a specific group dedicated to tsunami emergencies, so everything is to be understood

**Nicaragua:** The Caribe Wave 19 exercise has been useful to better prepare for Tsunami emergencies, as well as for the population in conditions of vulnerability in areas that are prone to floods during Tsunami events. It was a great experience for the community, more specifically for the education sector given the mass participation of all the schools, the interinstitutional articulation, as well as the active participation of community leaders. The message was sent, and they requested to delve into and carry out these exercises, beyond acquiring the recognition. We need further training in order to become multipliers as a municipality. To integrate all the neighborhoods of Bluefields, beyond the 10 coastal neighborhoods.



**Q54:** Have gaps in capability and capacity been identified? If yes, please specify in the comments.

Answered: 26 Skipped: 3



ANSWER CHOICES	RESPONSES	
Yes	84.62%	22
No	15.38%	4
<b>TOTAL</b>		<b>26</b>

**Comments:**

**Antigua & Barbuda:** Staff changes is real so more and better sustained engagement is required.

**Barbados:** Some agencies received the exercise information via indirect means. There were also issues with the use of the CAP.

**Belize:** Gaps are mainly in capability, in communications between the TNC/TWFP and NEMO / regional coordinators to plan ahead to carry out the simulation exercise together. In terms of capacity, there is no one focusing on tsunami modelling.

**Colombia:** Se requiere mayor sensibilización a la comunidad, preparación de la respuesta ante eventos de Tsunami y la elaboración de mapas de inundación y evacuación, así como la instalación de la señalización. Fortalecer los preparativos para la respuesta en las autoridades locales y comunidades. Elaboración del plan nacional de respuesta ante el evento de Tsunami

**Costa Rica:** Improve local capacity building

**France:** there are not enough sirens to inform the public

**Grenada:** The need for more stakeholders to know their role and better communicate message when received

**Guatemala:** SOPs must be revised, communication is too slow, products must be standardized

**Haiti:** Lack of coordination

**Mexico:** Absence of signaling of areas at risk due to tsunami and evacuation routes

**Nicaragua:** Lack of equipment, labeling and signage related to evacuation, sirens, more time for dissemination and for capability strengthening training sessions.

**Saint Lucia: Redundancy in communications need to strengthened**

**Saint Vincent and the Grenadines:** Mapping, evacuation planning and public education

**Trinidad and Tobago:** Yes. The TWFP has to be more involved in warning/dissemination of products. A meeting is to be scheduled in the late part of April to address issues and chart the way forward.

**UK- Anguilla:** there is still some public education opportunities that need to be taken advantage of

**UK- Bermuda:** The TWFP alternate, Marine Operations Centre (MAROPS), requires extra training - to be implemented.

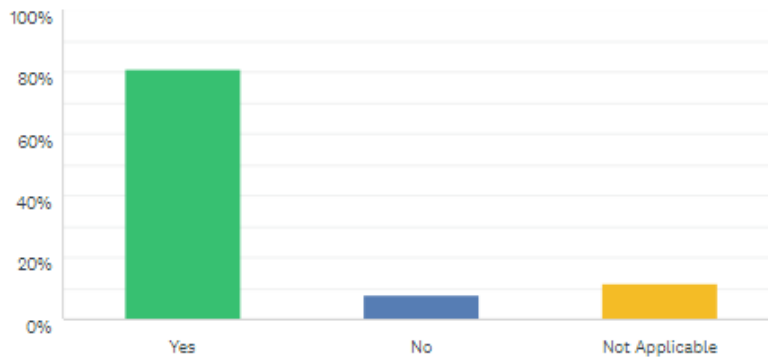
**UK- British Virgin Islands:** Persons that are hearing impaired, elderly population and those that are wheel chair bound

**UK- Cayman Islands:** Several areas were identified that need strengthening such as inter agency notification. The need for additional stakeholder training for the tourism sector, issues with on call and duty officer processes for 24 hour response for certain agencies, need for improved capacity to communicate with marine assets, need for training for police in evacuation procedures

**USA- Puerto Rico:** Need to improve the government response on Tsunamis. Training, seasonal exercises and examination required to the employees involved in the response.

**Q55: Have the Country/Territory relationships with and among the Tsunami Warning System stakeholders as a result of the exercise been enhanced?**

Answered: 26 Skipped: 3



ANSWER CHOICES	RESPONSES	
Yes	80.77%	21
No	7.69%	2
Not Applicable	11.54%	3
<b>TOTAL</b>		<b>26</b>

**Comments:**

**Antigua & Barbuda:** The once per year exercise has improved awareness.

**Colombia:** Permitted to visualize and get to know the SNDAT at national, regional and local

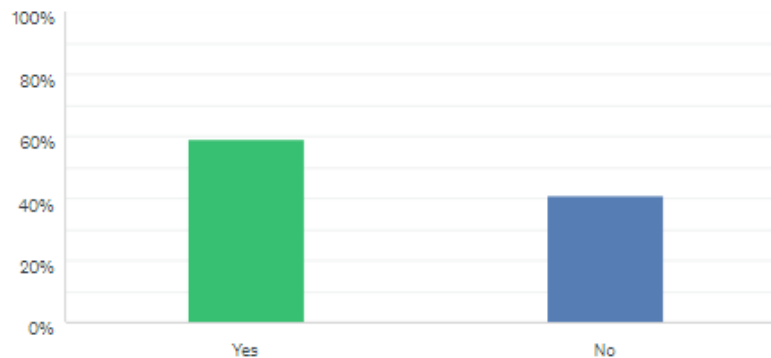
**Trinidad and Tobago:** No exercising of consequence took place this year.

**UK- Bermuda:** Marginally.

**USA- Puerto Rico:** But it has been noticed that these can be strengthened even more.

**Q56:** Did news media participate and cover the exercise? (Please provide electronic links if applicable.)

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES	
Yes	59.26%	16
No	40.74%	11
<b>TOTAL</b>		<b>27</b>

**Comments:**

**Colombia:.**

1. Twitter de Dimar:  
<https://twitter.com/Dimarcolombia/status/1106196558108938242>  
<https://twitter.com/Dimarcolombia/status/1106196618485919744>  
<https://twitter.com/DapardAntioquia/status/1106212347679571968>  
<https://twitter.com/Dimarcolombia/status/1106218004654768129>  
<https://twitter.com/Dimarcolombia/status/1106235176093392896>  
<https://twitter.com/Dimarcolombia/status/1106277252826890240>  
<https://twitter.com/Dimarcolombia/status/1106288429380390913>  
<https://twitter.com/Dimarcolombia/status/1106298855908347904>  
<https://twitter.com/Dimarcolombia/status/1106646936621338625>
2. Simulacro internacional de tsunami se tomó Turbo - Teleantioquia Noticias  
<https://www.youtube.com/watch?v=2ZOMzyhNyBY&feature=youtu.be>
3. Realizaron simulacro contra tsunami en San Andrés [http://www.xn--elisleo-9za.com/index.php?option=com\\_content&view=article&id=17171:realizan-simulacro-contra-tsunami-en-san-andres&catid=60:actualidad&Itemid=96](http://www.xn--elisleo-9za.com/index.php?option=com_content&view=article&id=17171:realizan-simulacro-contra-tsunami-en-san-andres&catid=60:actualidad&Itemid=96)
4. <https://www.teleislas.com.co/programas/contenidos/teleislasnews>

**Saint Lucia:** exercise coordinator was on several media outlets on the days leading to the exercise informing the public about what was happening. The local news outlets covered the event

**México:** <http://www.cambiodigital.com.mx/mosno.php?nota=405796>

**Nicaragua:** <https://bit.ly/2um6izE> <https://bit.ly/2U8CiG9> <https://bit.ly/2Whm62n>  
<https://bit.ly/2CqUVef> <https://bit.ly/2Jsr0rW> <https://bit.ly/2UV2dhx> <https://bit.ly/2usLmXH>  
<https://bit.ly/2Tzg4se> <https://bit.ly/2HPc8kS> <https://bit.ly/2YqreDB> <https://bit.ly/2Tyro82>  
<https://bit.ly/2ut1KYk> <https://bit.ly/2WisXbS> <https://bit.ly/2UQGKGq> <https://bit.ly/2WpHCSW>  
<https://bit.ly/2JC3VmN> <https://bit.ly/2Wq0eCm> <https://bit.ly/2FrZcyJ> <https://bit.ly/2CCyrXP>  
<https://bit.ly/2CFEDy4> <https://bit.ly/2Oo6WpB> <https://bit.ly/2WmlrM4> <https://bit.ly/2FyPmLE>  
<https://bit.ly/2WokSCQ> <https://bit.ly/2YpGwZg> <https://bit.ly/2urZqAC> <https://bit.ly/2TWy9p7>  
<https://bit.ly/2Ua0GXz> <https://bit.ly/2HGzxWm> <https://bit.ly/2Wprbpz>

**UK- Bermuda:** Just the government press release - <http://bernews.com/2019/03/tsunami-exercise-scheduled-thursday-2/>

**UK- British Virgin Islands:** <http://bvibeacon.com/virgin-islands-takes-part-in-caribe-wave-2019-tsunami-drill/>

**UK- Cayman Islands:** <https://www.youtube.com/watch?v=typ-tSXhUi0> and also here <https://caymannewsservice.com/2019/03/hmci-tsunami-busy-day/>

**USA- Puerto Rico:** TV, Radio, social media and paper press

**Venezuela:** <http://www.correodelorinoco.gob.ve/nueva-esparta-participo-en-simulacro-de-alerta-de-tsunami-caribe-wave-2019;>  
<http://www.ultimasnoticias.com.ve/noticias/comunidad/venezuela-se-sumo-al-caribe-wave-2019/>  
<https://primicia.com.ve/guayana/ciudad/ejercito-realizo-caribe-wave-2019/>  
<http://www.radiomundial.com.ve/article/venezuela-particip%C3%B3-en-la-octava-edici%C3%B3n-del-ejercicio-internacional-caribe-wave-2019>  
<http://www.ultimasnoticias.com.ve/noticias/comunidad/simulacion-del-caribe-wave-2019-se-hizo-en-anzoategui/> <http://www.elsoldemargarita.com.ve/posts/post/id:217545/Simulacro-Caribe-Wave-permiti%C3%B3-en-Nueva-Esparta-evaluar-comunicaciones-entre-centros-de-alerta>

**Q57:** Indicate the satisfaction of Members State/Territory with the exercise on the following levels from 1 (poorly satisfied) to 5 (very satisfied).

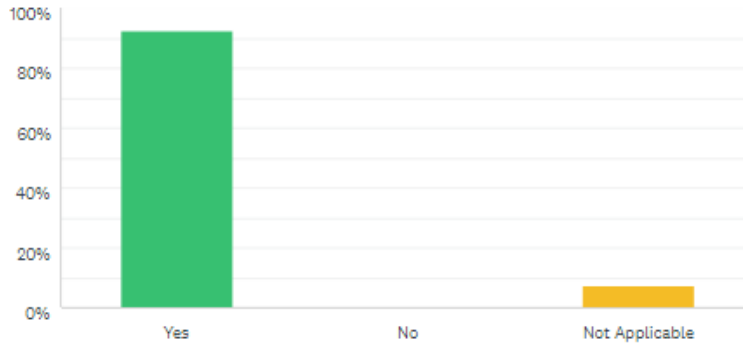
Answered: 24 Skipped: 5



	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
▼ Satisfaction of MS/T	4.17% 1	8.33% 2	20.83% 5	37.50% 9	29.17% 7	24	3.79

**Q58:** Did the exercise planning at the international level meet your expectations?

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	92.59% 25
No	0.00% 0
Not Applicable	7.41% 2
TOTAL	27

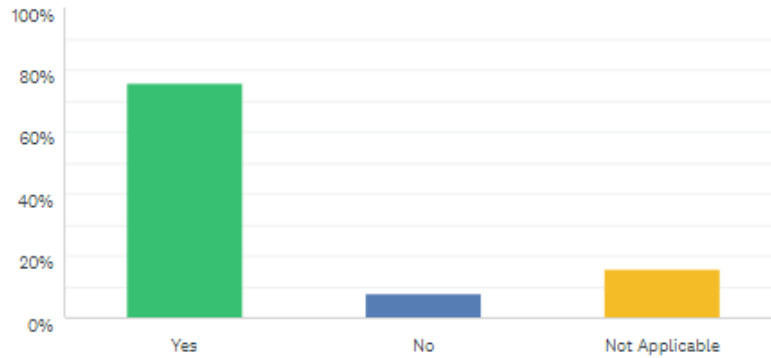
**Comments:**

**Saint Lucia:** Need more timely information; need more planning meetings or webinars

**Saint Vincent and the Grenadines:** Need to see more involvement of the Seismic Research Centre as the regional body responsible for seismic hazards in the region.

### Q59: Did the exercise planning at the national level go well?

Answered: 25 Skipped: 4



ANSWER CHOICES	RESPONSES	
Yes	76.00%	19
No	8.00%	2
Not Applicable	16.00%	4
<b>TOTAL</b>		<b>25</b>

#### Comments:

**Colombia:** Se presentó una buena coordinación interinstitucional y articulación entre las entidades del SNDAT

**Guatemala:** There is much to improve, but everything is going well

**Nicaragua:** Excelent

**NL- Curacao:** It was a surprise for the agencies

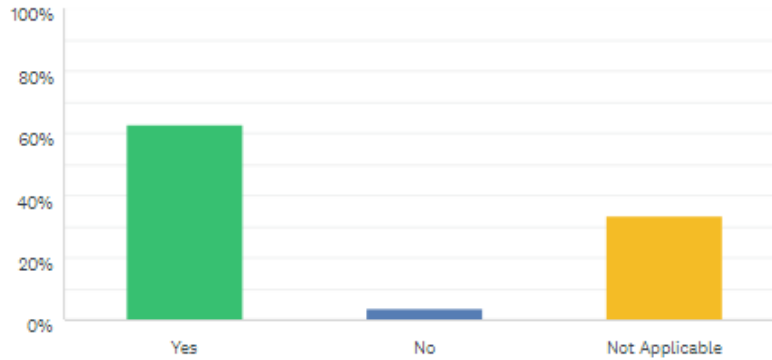
**UK- Bermuda:** For the most part. However, there was some miscommunication with the EMO on warning messaging.

**USA- Puerto Rico:** Yet, we suggest that the domestic products and scenario selection would be discussed between agencies with a month of anticipation (at most).



**Q60:** Did the exercise planning at the state/local level go well?

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	62.96% 17
No	3.70% 1
Not Applicable	33.33% 9
<b>TOTAL</b>	<b>27</b>

**Comments:**

**Colombia:** Hubo interés por parte del nivel local de participar en el ejercicio.

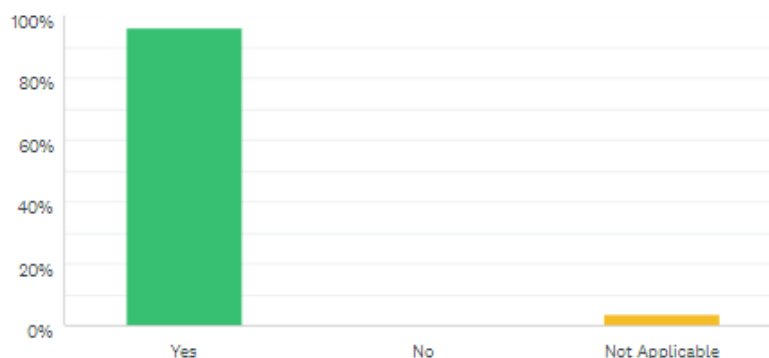
**Nicaragua:** Excelent

**UK- Bermuda:** Already covered by 46.

**USA- Puerto Rico:** More than expected.

**Q61:** Were the Caribe Wave 19 Tsunami Exercise website pages (eg. caribewave.info, tsunamizone.org/Caribbean) useful?

Answered: 27 Skipped: 2



ANSWER CHOICES	RESPONSES
Yes	96.30% 26
No	0.00% 0
Not Applicable	3.70% 1
<b>TOTAL</b>	<b>27</b>

**Comments:**

**Colombia:** A DIMAR como TWFP fue útil para la consulta del manual del ejercicio, los webinar, la descarga del formulario de evaluación previo al ejercicio. Y a través de TsunamiZone.org, se realizó un registro activo del ejercicio, lo cual nos permitió tener un conteo más efectivo de las participantes.

**NL- Bonaire, Saba, Sint Eustatius:** They are a little bit crowdy. It is also difficult to find them Googleling (too many different sites).

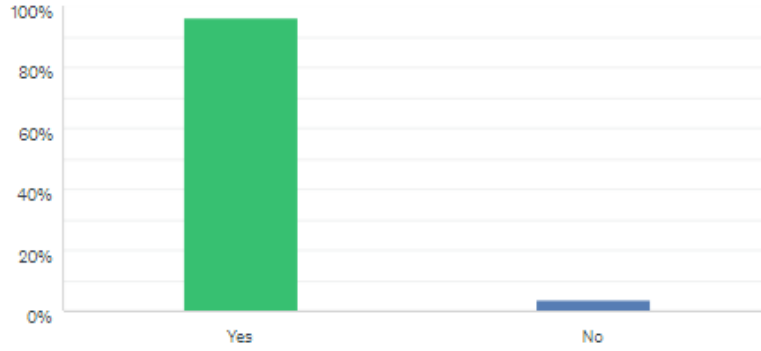
**Q62: How many people do you estimate participated in the exercise within your country/territory (use own statistics or tsunami.zone registration system)?**

<b>Country</b>	<b>Number of Participants according to Member States</b>
<b>Anguilla</b>	1,200
<b>Antigua and Barbuda</b>	34
<b>Aruba</b>	
<b>Bahamas</b>	
<b>Barbados</b>	1,000
<b>Belize</b>	8
<b>Bermuda</b>	368
<b>Brazil</b>	
<b>British Virgin Islands</b>	800
<b>Cayman Islands</b>	90
<b>Colombia</b>	521
<b>Costa Rica</b>	200
<b>Cuba</b>	
<b>Curaçao</b>	200
<b>Dominica</b>	55
<b>Dominican Republic</b>	>8,399
<b>France</b>	3,000
<b>Grenada</b>	1,000 estimated, 80,000 text messaging, 10,000 plus registration, plus private sector
<b>Guadeloupe</b>	
<b>Guatemala</b>	60
<b>Guyana</b>	10
<b>Haiti</b>	817

<b>Honduras</b>	
<b>Jamaica</b>	
<b>Martinique</b>	
<b>Mexico</b>	1,500
<b>Montserrat</b>	
<b>Netherlands</b>	<b>Bonaire, Saba, Sint Eustatius:</b> 40 Including TWFPs, NDWOs, and local authorities
<b>Nicaragua</b>	21,014
<b>Panama</b>	
<b>Puerto Rico</b>	159,536
<b>Saba</b>	
<b>Saint Barthélemy</b>	
<b>Saint Kitts and Nevis</b>	
<b>Saint Lucia</b>	3,500
<b>Saint Martin</b>	
<b>Saint Vincent and the Grenadines</b>	350
<b>St Eustatius</b>	
<b>Sint Maarten</b>	25
<b>Suriname</b>	
<b>Trinidad and Tobago</b>	30
<b>Turks and Caicos</b>	Did not receive any message
<b>U.S. Virgin Islands</b>	
<b>Venezuela</b>	420,099

**Q63:** Did the Caribe Wave 19 Participant Handbook provide an appropriate level of detail?

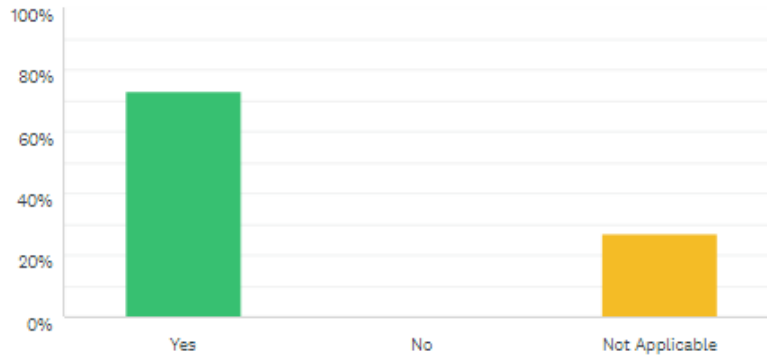
Answered: 26 Skipped: 3



ANSWER CHOICES	RESPONSES	
▼ Yes	96.15%	25
▼ No	3.85%	1
<b>TOTAL</b>		<b>26</b>

**Q64:** Were the Caribe Wave 19 Webinars helpful in preparing for the exercise?

Answered: 26 Skipped: 3



ANSWER CHOICES	RESPONSES
▼ Yes	73.08% 19
▼ No	0.00% 0
▼ Not Applicable	26.92% 7
<b>TOTAL</b>	<b>26</b>

**Comments:**

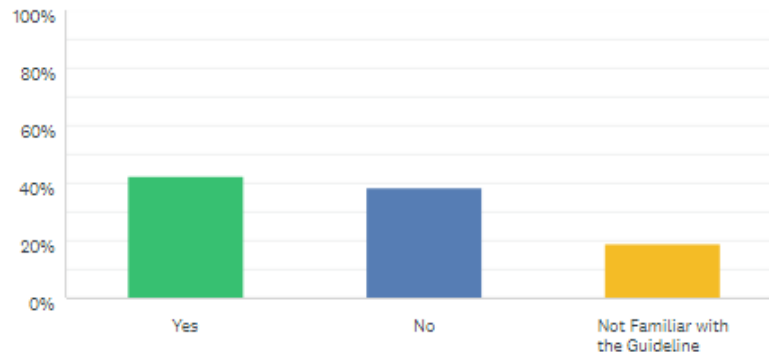
**Belize:** Was unable to attend Webinars

**Colombia:** Son de gran utilidad para la coordinación del ejercicio, despejar dudas y que todos los países tengan la misma información sobre el ejercicio.

**Guyana:** I had difficulties hearing in the Webinar.

**Q65:** 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: 26 Skipped: 3



ANSWER CHOICES	RESPONSES
Yes	42.31% 11
No	38.46% 10
Not Familiar with the Guideline	19.23% 5
<b>TOTAL</b>	<b>26</b>

**Comments:**

**Antigua & Barbuda:** These will be answered by NTWC

**Colombia:** La utilizamos para definir el nivel de participación desde lo nacional hasta lo local en el ejercicio

**Q66:** If used, indicate the usefulness of this document for the conduct exercises on the following levels from 1 (poor) to 5 (excellent).

Answered: 13 Skipped: 16

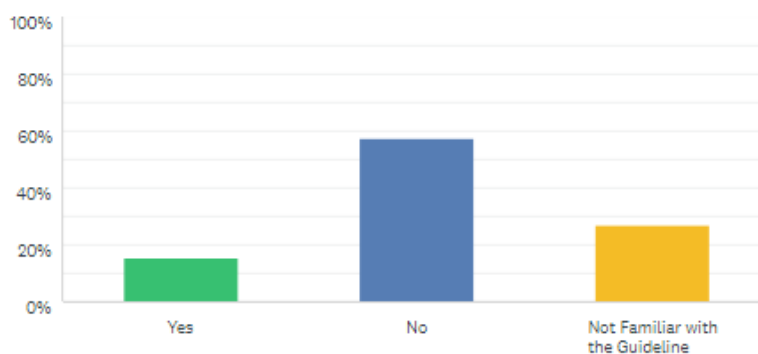


	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
IOC How to Plan, Conduct, and Evaluate Tsunami Exercises	0.00% 0	0.00% 0	15.38% 2	46.15% 6	38.46% 5	13	4.23



**Q67:** Did your country use the methodological guidelines How to Prepare, Conduct and Evaluate a Community-based Tsunami Response Exercise ([http://www.ioc-tsunami.org/index.php?option=com\\_oe&task=viewDocumentRecord&docID=19139](http://www.ioc-tsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=19139)) before or during CARIBE WAVE Exercise 19?

Answered: 26 Skipped: 3



ANSWER CHOICES	RESPONSES
Yes	15.38% 4
No	57.69% 15
Not Familiar with the Guideline	26.92% 7
<b>TOTAL</b>	<b>26</b>

**Comments:**

**Antigua & Barbuda:** Not this time around

**Colombia:** Dimar CNAT socializará esta guía con la Unidad Nacional para la Gestión del Riesgo de Desastres de manera tal que sea aplicada por la parte local.

**NL- Bonaire, Saba, Sint Eustatius:** Unclear what was expected of each party after registration for the exercise.

**Q68:** If used, indicate the usefulness of this document for the conduct exercises on the following levels from 1 (poor) to 5 (excellent).

Answered: 5 Skipped: 24



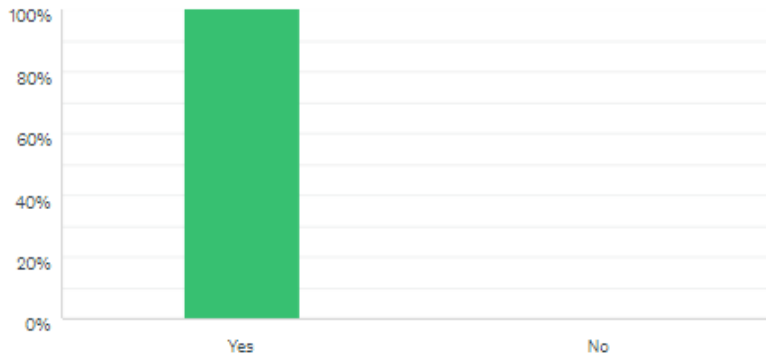
	1	2	3	4	5	TOTAL	WEIGHTED AVERAGE
Methodoloical Guidelines	0.00% 0	0.00% 0	0.00% 0	60.00% 3	40.00% 2	5	4.40

**Comments:**

**Antigua and Barbuda:** We have used them before but not for this exercise.

**Q69: Is this evaluation appropriate?**

Answered: 20 Skipped: 9



ANSWER CHOICES	RESPONSES
Yes	100.00% 20
No	0.00% 0
TOTAL	20

**Colombia:** Sería de gran utilidad que se incluyan preguntas de la actuación y respuesta en el nivel local

**Puerto Rico:** Always help to improve. In addition, this survey was completed with additional comments from Gisela Baez, PRSN.

**Saint Vincent and the Grenadines:** too long

**Q70:** Please provide a general statement on your CARIBE WAVE 19 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 20 exercise, format, scenario, etc.

**Comments:**

**Antigua & Barbuda:** The 2019 exercise provided a chance for the Government civil society and Private sector to review and re-orientate those whom will have responsibility for coordination of response and continuity of Government. 1. review and update warning at the national and community levels 2. complete the installation signs and safe areas 3. complete the disaster plan.

According to Keithley Meade from the Antigua and Barbuda Met Services (TWFP), at the national level, there was not enough effort put into involving more stakeholders, or making this into a truly national event. Activities at the national level were disjoint at best. Greater collaboration is needed between the TWFP and the NTWC, and other stakeholders, so as to make the best use of these exercises and expand them into national events. There is also the question of the SOPs which were developed a long time ago. Though they are still used by the TWFP, there are many glaring gaps; they were never completed to begin with. They are also not well circulated and not well known by the persons who will be called upon to execute them. There is still a lot of work to do.

**Barbados:** The exercise went well at the Barbados Meteorological Services in reference to the timely dissemination of the messages to the relevant authorities. The downside was that there were issues in sending out the messages via the Common Alert Protocol (CAP) due to circumstances beyond control of the BMS. The BMS felt that the CAP would have been the more effective method of sending tsunami alerts as there are options in the programme including radio interrupts, smartphones and so on.

**Belize:** As our fax machine is not working, we needed to have the TNC forward the simulation exercise messages - received via email - to the TWFP which include on-duty forecasters. This might have seemed overwhelming to some, as there was no planning made in sufficient time ahead of the exercise date. The TWFP is also a different entity from the NEMO and there are gaps in relationships among the parties which we have noted that we need to improve upon. So for this year, all the information had to remain mainly within the TWFP and shared with national coordinator of the NEMO as sharing with any others might have caused panic and disruption without the planning ahead.

**Colombia:** A nivel Internacional El ejercicio permito probar los medios de comunicación establecidos con el PTWC, la interpretación de sus boletines y los productos mejorados. A nivel Nacional: El ejercicio permitió evaluar la capacidad de recepción y difusión de información, para tal caso fue oportuna en aras de las acciones que como país se deben generar para garantizar la oportuna evacuación de zonas de riesgo por Tsunami. Permitted to evaluate the Protocol of Communication of the National System of Detection and Alert for Tsunami, being useful to improve the channels of communication, the bulletins and the times of emission of bulletins. Se evidencia interés de realizar más ejercicios que permitan evaluar las

comunicaciones y la preparación ante los Tsunamis desde lo local, regional y nacional. Se requiere realizar mayor difusión del material de educación pública, plegables, videos, redes sociales. Sirvió para evidenciar las falencias nacionales en relación a mapas de inundación, evacuación y señalización presentes en los municipios de Caribe colombiano, así como la ausencia de planes de respuesta para el Caribe colombiano. Se evidenció la importancia de la participación de los medios de comunicación y de los colegios en el ejercicio. En cuanto al formato de evaluación se recomienda incluir más preguntas que permitan evaluar el desarrollo del ejercicio en las comunidades.

**Dominica:** The exercise was small but very successful

**Dominican Republic:** We understand that the Caribe Wave exercise was well organized, by the planners. These Caribbean Wave programs have been useful for forecasters and assistants to have greater knowledge about the handling of tsunami warnings and warnings. We have a suggestion to include below the data of the seismic event the type of movement of the sliding plate or of subduction, this to extend the knowledge.

**Grenada:** Caribe Wave 2019 was a very successful exercise for Grenada, as the scenario gave us an opportunity to test the SOP created from last year's Tsunami Ready pilot project in St. Patrick's. It also allowed us to test our national response plan. The exercise simultaneously happened in St. Patrick and on the Sister Isle of Carriacou. One of the main challenges observed from the exercise was that of communication from the focal point/ warning center to the national emergency coordinating center/ personnel. Because of that evacuation was delayed and the first alerting system in the SOP (Police siren) was not enabled on time. But we did get to use the newest alerting system; church bells in this exercise. On a positive note, we were able to reach over 80% of the population through media interventions, SMS and house to house interventions. In addition, we were able to use employers both in Private and Public sectors to sensitize and engage people. In parishes outside of the exercise area, we tested communication and identifying evacuation routes and muster points. We also had an opportunity to test evacuation time and plans for three vulnerable groups within the hazard zone; elderly, children and pregnant women. Grenada is in need of an electronic siren service for Tsunami's and to complete the inundation mapping for country, including signing and erection of maps. We are extremely grateful for the exercise, as it has awakened a virtual dead hazard for us and the importance of being prepared for its unpredictable occurrence.

**Haiti:** For the moment everything is quite good. In Haiti we should have a better exercise. We didn't have a better planification because of the bad political situation. For CARIBE WAVE 2020 we would like to have a better exercise. There is a Tsunami Ready project in Jeremie. We would like a scenario impacting Jeremie

**Mexico:** The communication between PTWC and CAT was made without mishap, details of distribution of the bulletins issued by the CAT were presented. The time of reception of the bulletins was 51% of the participants received the bulletin between 08:05 and 08:10 hours, and after 08:40 hours 49%. This due to the internet service. Therefore, the response times, ignorance of the actions to be carried out, working hours and lack of satellite communication systems, make response procedures more difficult.

**Nicaragua:** Excellent this exercise. We had more participation of the population and coordination with different institutions and local communities.

**NL- Bonaire, Saba, Sint Eustatius:** Overall the exercise was useful. Communication procedures worked as expected. Main issue is receiving parties not answering the number 1 phone on the list. This delays communications to other concerned parties. Another issue was receiving parties being engaged in other important businesses. Real emergencies never come alone...Based on this exercise we may want to consider SMS messages on top of phone calls to reach all concerned at the same time.

**Saint Lucia:** In saint Lucia CARIBEWAVE 19 was tested in three phases The first phase was the testing of our mobile app, radio broadcast interrupt and activation of multihazard sirens the second phase saw the evacuation of eight schools in Castries to various assembly points the third phase was the evacuation of three schools and parts of the community of Canaries. What didn't go well was 1. Communication from PTWC was slow and did not arise until 10:30 am, when the estimated time of arrival of the wave for Castries was 10:22am. 2.No message was received from Seismic Unit on the earthquake and volcanic eruption 3. One of our sirens did not work, need to reevaluate the maintenance schedule

**Saint Vincent and the Grenadines:** The school evacuation exercise went well. We could have liked to see more involvement of the Seismic Research Centre (SRC) to provide more scientific guidance on the regional activation.

**UK- Anguilla:** Anguilla has participated in the exercise yearly and finds it to be a timely reminder that although tsunamis do not occur often that the threat is real. The exercise has very real meaning to the school children who have also participated in the exercise since its inception. In Anguilla's case this means that we have an entire generation who were brought up with tsunami education, which is vital to our future preparedness. The CaribeWave exercise continues to get better and is looked forward to by Disaster Management Anguilla.

**UK- Bermuda:** 1. Aside from some miscommunication with the local EMO of the number of warning emails sent to stakeholders, the exercise went according to plan. 2. However, Bermuda is well behind when it comes to public education, evacuation zones/mapping and alerting (sirens etc.). As a Tsunami is deemed a high impact but 'low probability' event for Bermuda, the government/EMO buy in to develop any of these items is poor (a very low priority when compared to tropical cyclone resilience/planning etc. which is high impact, high probability). 3. As already mentioned, this exercise scenario was somewhat 'weak' (expected wave less than 0.3m, and therefore Bermuda wasn't even mentioned in the tsunami threat section of the PTWC messaging) for Bermuda in terms of impact. However, it was still useful to go through this type of scenario for practice (rather than a larger, more significant impact). 4. Bermuda Weather Service's ideal wish list includes: i. More Government engagement/buy in for this important hazard mitigation process ii. Tsunami inundation mapping/modelling iii. Designated tsunami evacuation zones and relevant evacuation signage iv. An island wide public alerting system not in place currently - e.g. sirens v. Education in schools and beyond including pamphlets etc.

**UK- British Virgin Islands:** Despite the passing of the hurricanes people are very aware of the impacts tsunamis can have on the territory. Especially the most recent with the patrons on the beach. We have many functions like this locally and they see where this can possibly happen.

**UK- Cayman Islands:** It was a useful exercise for us. We brought together stakeholders to look at a specific area of vulnerability. The tourism sector. On the day of the exercise we had 5 cruise ships and 15 thousand cruise ship passengers in town and thousands of visitors sunning

themselves on Seven Mile Beach. First responders were asked to consider what they would do faced with the Caribe Wave Scenario. An informal discussion based format was used and a number of gaps were identified. It was also useful for the various first response agencies to come together to build familiarity with the plan, the tsunami threat and to identify areas for improvement.

**USA- Puerto Rico:** As a general statement on CARIBE WAVE 19 we can say the experience went well, more than expected. The planning for our local level was very good in both ways, exercise planning and exercise conduct. We think that we have to improve the communities participation and also the internal response from the government, give more education in this area so the response will be more efficient and faster than it is now. For the CARIBE WAVE 20 exercise we recommend to keep it simple and keep the same format. It is easy to understand, fast to implement, and not complication. Thanks for the opportunity.

**Venezuela:** The year 2019 for the Bolivarian Republic of Venezuela was a great challenge for the authorities and the population in general, we had previous events that led to change the mode of execution of the exercise, from simulation to simulation; However, that did not prevent during the activity, multiple events associated or not to the tsunami, which helped to increase the resolution of problems and remedy with state resources, emergencies and adverse effects caused by the said threat; communications were put to the test, which leads us to strengthen this area; Likewise, governance was strengthened and timely strategies were fine-tuned through protocols that lead to the least loss of human life possible during a real event.

## Supplement B. Sea Level Status

As part of the CARIBE WAVE 19 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, 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 period, 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	STATION	ETA
	LAT LON	(UTC)		
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	ETA
GAUGE LOCATION	GAUGE		TIME OF	STATION	
	COORDINATES		MEASURE		
	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 BE	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 BE	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	LOH			
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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