

CARIBE WAVE 2011 Evaluation



**ICG VI
SANTO DOMINGO, DOMINICAN REPUBLIC
APRIL 25-29, 2011**

**CHRISTA VON HILLEBRANDT-ANDRADE
ALINA NIEVES**

**NOAA NWS CARIBBEAN TSUNAMI WARNING
PROGRAM**

<http://www.srh.noaa.gov/srh/ctwp>

From the Plan to the Exercise ...

2

Limited Distribution



ICG/CARIBE EWS-II/11
Paris, 20 February 2007
Original: English only



Communication Plan for the Interim Tsunami Advisory Information Service to the Caribbean Sea and Adjacent Regions

23 July 2006 Version

NOAA Richard H. Hagemeyer
Pacific Tsunami Warning Center

1. Introduction
2. Product Issuance Criteria
3. Product Content
4. Product Dissemination
5. Communication Tests
6. Procedures for Acting on Products
7. Focal Points

Appendix I. Broadband seismic stations in the Caribbean and surrounding regions providing real time continuous waveform data to PTWC.

Appendix II. Sea level stations in the Caribbean providing near real time data to PTWC.

Appendix III. Sample Products

Intergovernmental Oceanographic Commission
technical series



93

EXERCISE CARIBE WAVE 11 A Caribbean Tsunami Warning Exercise

Participant Handbook

23 March 2011

Version française

Versión española

UNESCO

Chronology of the Exercise

over one year of planning....

3

- January 2010 – EEUU decided to hold LANTEX 2011 on March 23, 2011
- March 2010- ICG CARIBE EWS decides to hold on the same day CARIBE WAVE 2011 and CTWP is designated as lead
- April – August, 2010- Development of scenarios with the TWC's, regional organizations and national contacts.
- Octubre, 2010 Manual in English is finalized
- December, 2010 UNESCO IOC finalized manual in English, Spanish and French and made available on line.
- January 18 and 20, 2011 Webinars in Spanish and English
- February 1, 2 and 3, 2011 Webinars EAS (PR), CARIBE EWS (Spanish and English)
- March 11, 2011 Earthquake and Tsunami in Japan
- March 23, 2011 Exercise
- March 23 to now, preparation of report

PURPOSE OF THE EXERCISE

4

- The purpose of the exercise is to improve Tsunami Warning System effectiveness along the Caribbean coasts.
- The exercise provides an opportunity for emergency management organizations throughout the Caribbean to:
 - Exercise their operational lines of communications
 - Review their tsunami response procedures
 - Promote tsunami preparedness.

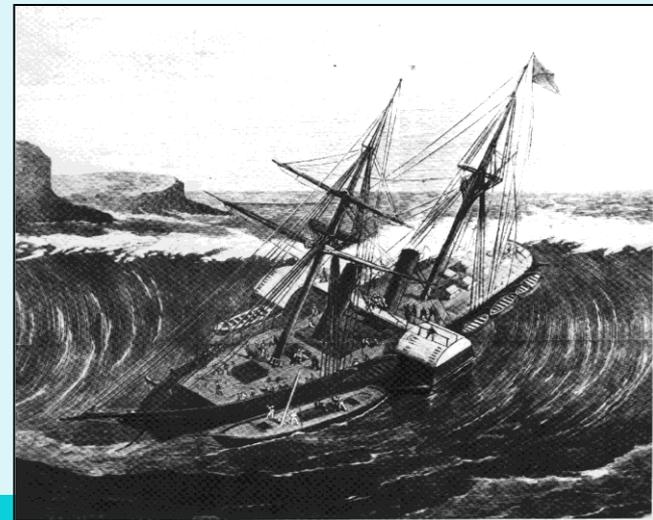
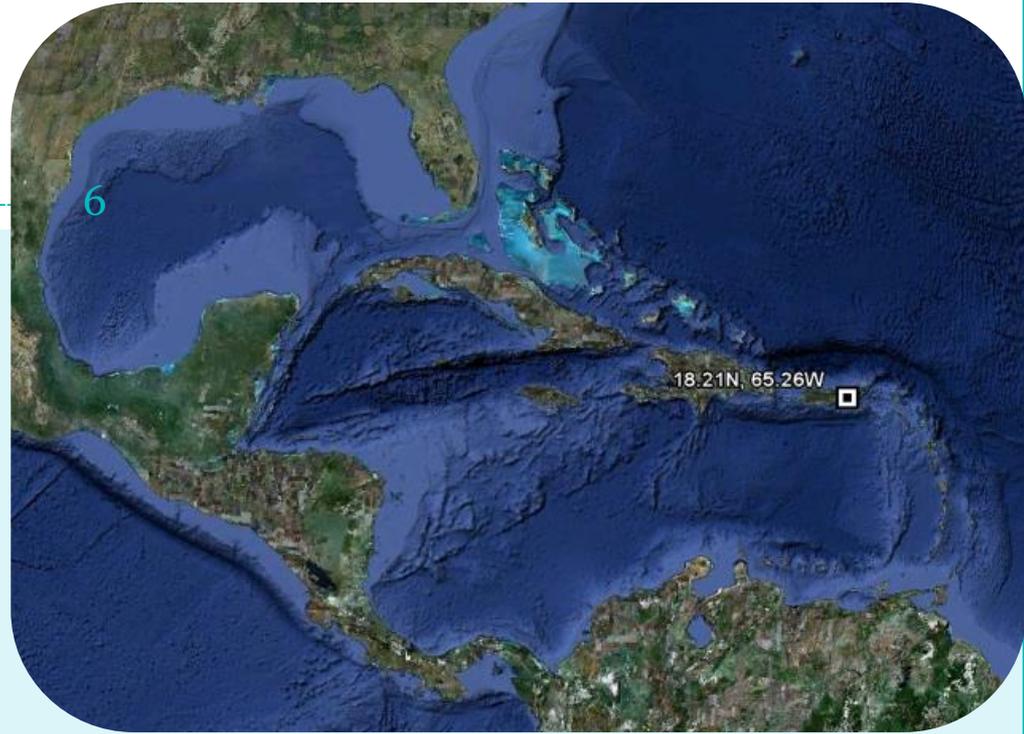
OBJECTIVES EXERCISE

5

- Ensure message transmission from the TWCs to Tsunami Warning Focal Points (TWFP) and from these primary contacts to the EMOs.
- Test tsunami response plans for Caribbean EMOs that have developed plans, and provide a catalyst for countries and EMOs that have not developed plans.
- EMOs, Tsunami Warning Focal Points (TFWP) and Tsunami National Contacts review, discuss, and evaluate the various communication alternatives for receiving and disseminating tsunami messages.
- EMOs, Tsunami Warning Focal Points and Tsunami National Contacts review, discuss, and evaluate potential response actions and challenges.
- Identify processes to issue local all-clear notices.

SCENARIO

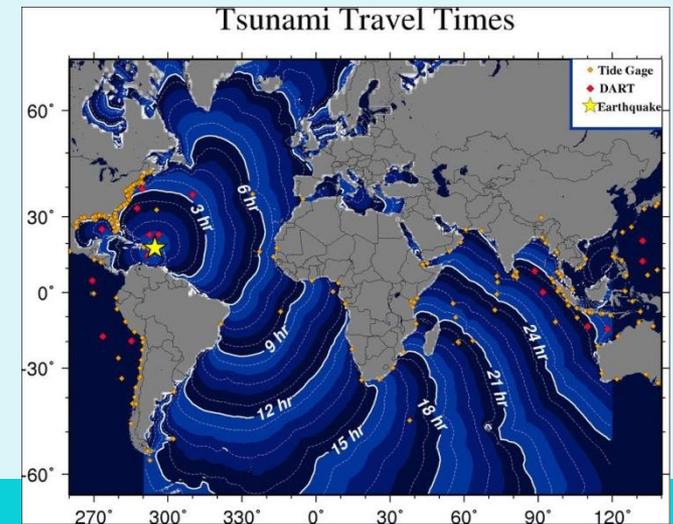
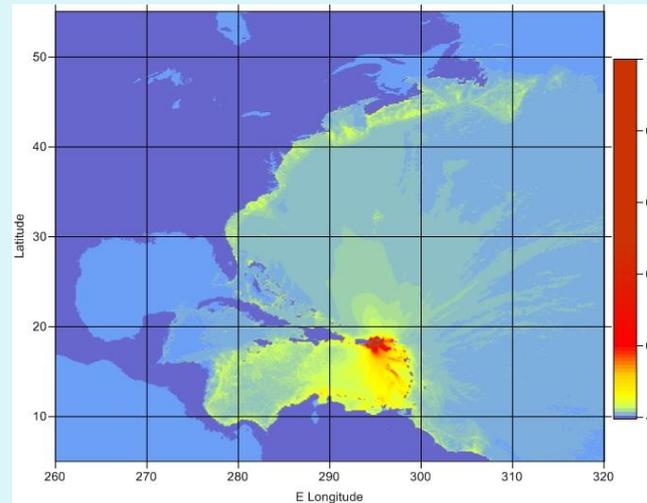
- Based on the earthquake and tsunami of November 18, 1867, for which waves of up to 10 meters were reported in the Caribbean



EXERCISE SCENARIO-TSUNAMI

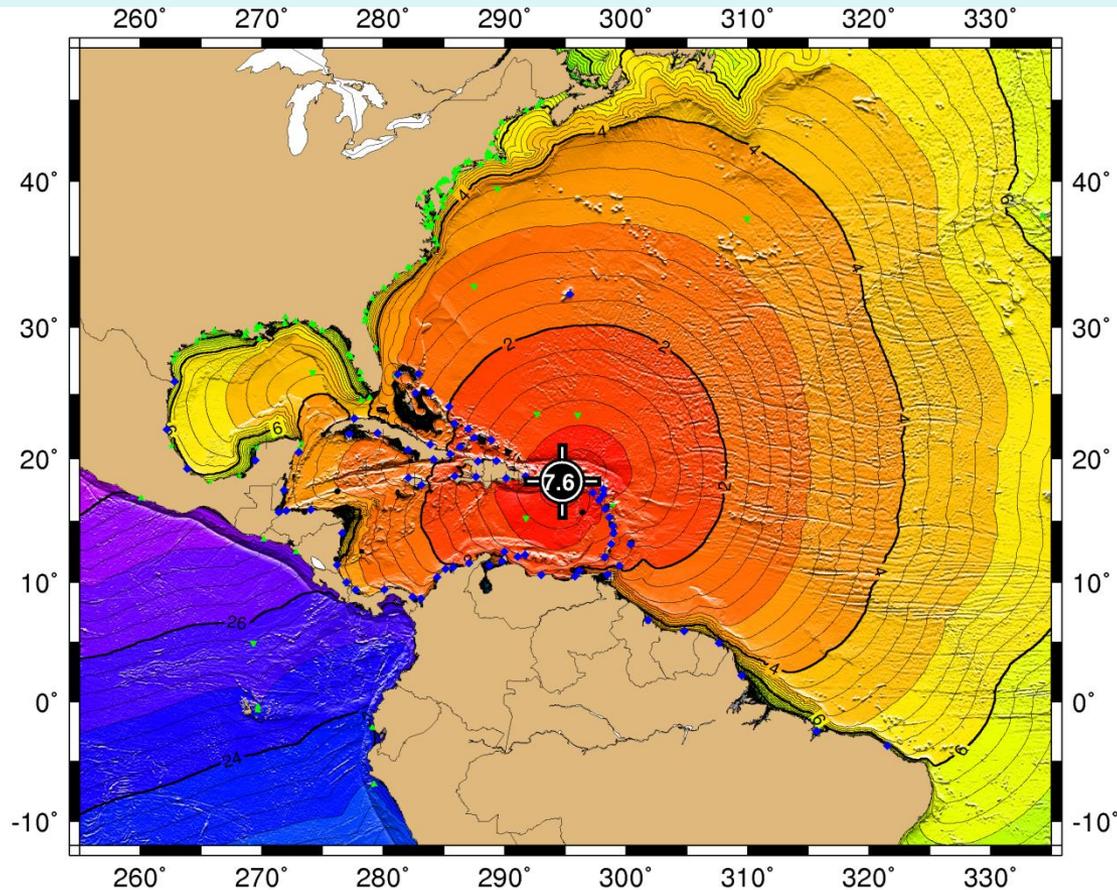
7

- The maximum offshore wave height modeled was 4.7 m.
- The height of the waves along the coast can be estimated by multiplying by 2.



TSUNAMI TRAVEL TIMES

8



GMT 2011 Feb 12 13:30:11 TSUNAMI TRAVEL TIMES USING EPICENTER, ● = Past EQ, ▲ = SL, ▼ = DART, ★ = CNTR, ■ = EXT, ◆ = GAP/NON, + = PLN, ◆ = FP

In addition to the tsunami forecast points arrival times were calculated for an additional 200 points.

TSUNAMIS ALERT LEVELS

English

West Coast & Tsunami Warning Center
<http://www.ptwc.srh.noaa.gov>
Puerto Rico Seismic Network
<http://trubidolite.usgs.edu> Telephone: 787-633-8633

TSUNAMI MESSAGES

- WARNING**
 - Danger!
 - Run for high ground!
 - Follow emergency instructions.
- ADVISORY**
 - Possible strong and dangerous local currents.
 - Get out of the water and off the beach.
 - Stay tuned for local emergency guidance.
- WATCH**
 - Potential danger.
 - Stayed tuned for more information.
- INFORMATION STATEMENT**
 - Relax.
 - No danger.
 - A distant ocean basin may be in danger.

WEST COAST & ALASKA TSUNAMI WARNING CENTER

Pacific Tsunami Warning Center
<http://www.weather.gov/ptwc/index.php>
Caribbean Tsunami Warning Program
<http://www.srh.noaa.gov/srh/ctwp>
TSUNAMI MESSAGES FOR THE CARIBBEAN EXCEPT FOR PUERTO RICO AND THE US VIRGIN ISLANDS

- CARIBBEAN SEA-WIDE TSUNAMI WATCH**
 - Danger for all coasts within the Caribbean Region!
 - Run for High Ground!
 - Follow the instructions of the emergency management officials.
- REGIONAL TSUNAMI WATCH**
 - Danger for coasts within a thousand kilometers from Earthquake!
 - Run for High Ground!
 - Follow the instructions of the emergency management officials.
- LOCAL TSUNAMI WATCH**
 - Danger for coasts within a hundred kilometers from Earthquake!
 - Run for High Ground!
 - Follow the instructions of the emergency management officials.
- INFORMATION STATEMENT**
 - Relax.
 - No Danger.
 - A more distant place may be in danger.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NOAA
 U.S. DEPARTMENT OF COMMERCE

NATIONAL WEATHER SERVICE
 U.S. DEPARTMENT OF COMMERCE

TSUNAMIS ALERT LEVELS

Spanish

Centro de Alerta de Tsunami de la Costa Oeste & Alaska
<http://wcotwc.arh.noaa.gov>

Red Sísmica de Puerto Rico
<http://redsismica.uprm.edu> Teléfono: 787-833-8433

MENSAJES DE ALERTA DE TSUNAMI PARA PUERTO RICO E ISLAS VÍRGENES



¡Peligro!
 • ¡Corra a tierras altas!
 • Siga las instrucciones de emergencia.

Aviso

Advertencia

- Posibles corrientes locales fuertes y peligrosas.
- Salir del agua y playas.
- Estar pendiente a más información de emergencia

Peligro potencial.
 • Permanezca alerta para más información.

Vigilancia

- Está tranquilo.
- No hay peligro.
- Una cuenca oceánica distante puede estar en riesgo.

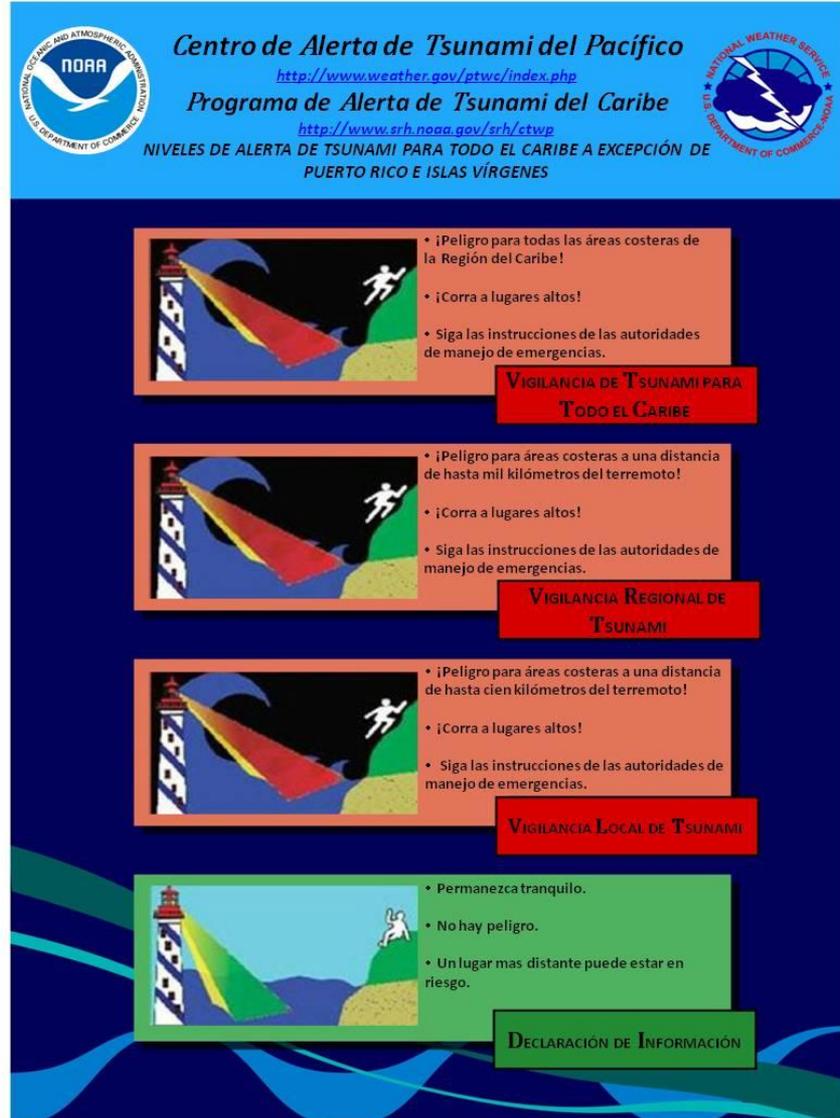
Boletín Informativo

WEST COAST & ALASKA TSUNAMI WARNING CENTER

Centro de Alerta de Tsunami del Pacífico
<http://www.weather.gov/ptwc/index.php>

Programa de Alerta de Tsunami del Caribe
<http://www.srh.noaa.gov/srh/ctwp>

NIVELES DE ALERTA DE TSUNAMI PARA TODO EL CARIBE A EXCEPCIÓN DE PUERTO RICO E ISLAS VÍRGENES



¡Peligro para todas las áreas costeras de la Región del Caribe!
 • ¡Corra a lugares altos!
 • Siga las instrucciones de las autoridades de manejo de emergencias.

VIGILANCIA DE TSUNAMI PARA TODO EL CARIBE

¡Peligro para áreas costeras a una distancia de hasta mil kilómetros del terremoto!
 • ¡Corra a lugares altos!
 • Siga las instrucciones de las autoridades de manejo de emergencias.

VIGILANCIA REGIONAL DE TSUNAMI

¡Peligro para áreas costeras a una distancia de hasta cien kilómetros del terremoto!
 • ¡Corra a lugares altos!
 • Siga las instrucciones de las autoridades de manejo de emergencias.

VIGILANCIA LOCAL DE TSUNAMI

- Permanezca tranquilo.
- No hay peligro.
- Un lugar mas distante puede estar en riesgo.

DECLARACIÓN DE INFORMACIÓN

CHRONOLOGY



WARNING

WATCH

Fecha (UTC)	Hora (UTC)	Mensaje del WCATWC				Mensaje del PTWC				
		#	Tipo	Ficticio	Correo electrónico	#	Tipo	Ficticio	Correo electrónico	
03/23/2011	13.00		----- Se produce el seísmo -----							
03/23/2011	13.02	01	Alerta	Sí	Sí	01	Aviso	Sí	Sí	
03/23/2011	13.32	02	Alerta	No	Sí					
03/23/2011	14.01	03	Alerta	No	Sí	02	Aviso	No	Sí	
03/23/2011	14.31	04	Alerta	No	Sí					
03/23/2011	15.00	05	Alerta	No	Sí	03	Aviso	No	Sí	
03/23/2011	15.30	06	Alerta	No	Sí					
03/23/2011	16.01	07	Adv	No	Sí	04	Aviso	No	Sí	
03/23/2011	16.30	08	Adv	No	Sí					
03/23/2011	17.01	09	Can	No	Sí	05	Aviso	No	Sí	
03/23/2011	18.02					06	Can	No	Sí	

Problema de Traducción: “...hay un potencial de confusión en la traducción de los términos críticos (advisory, watch, warning) al español” (Comentario de Colombia). En Puerto Rico se comento lo mismo

METHODS OF TRANSMISSION OF THE DUMMY MESSAGE

12

 **GTS**

Centro	ID OMM	ID AWIPS	NWWS	SMT	EMWIN	Fax	Correo electrónico
WCATWC	WEXX20 PAAQ	TSUAT1	Sí	Sí	Sí	Sí	Sí
PTWC	WECA41 PHEB	TSUCAX	Sí	Sí	Sí	Sí	Sí

NWWS NOAA Weather Wire Service[red de telecomunicaciones de la NOAA]
GTS Sistema Mundial de Telecomunicación
EMWIN Red de Información Meteorológica para Administradores de Situaciones de Emergencia

Dissemination and Promotion of the Exercise

Talks, webinars, visits, web sites, media

13

CARIBE WAVE/LANTEX 2011 Exercise (CTWP)

The CARIBE WAVE 11/ LANTEX 11 tsunami exercise is being conducted to assist tsunami preparedness efforts throughout the Caribbean region. The purpose of the exercise is to improve Tsunami Warning System effectiveness along the Caribbean coasts. The exercise provides an opportunity for emergency management organizations throughout the Caribbean to exercise their operational lines of communications, review their tsunami response procedures, and promote tsunami preparedness.

CARIBE WAVE/LANTEX 2011 Participant Handbook (pdf)

- [English](#)
- [Español](#)
- [Français](#)

UNESCO Circular Letter (pdf)

- [English](#)
- [Español](#)
- [Français](#)

Webinars (pdf)

- Caribe Wave 11 and LANTEX_2011 [English](#) (January 18) | [Español](#) (20 de enero)
- Caribe Wave 11 and LANTEX 2011 - A Caribbean Tsunami Warning Exercise - [2nd Webinar](#) March 1
- CARIBE WAVE 11 y LANTEX 2011 - Un Ejercicio de Alerta de Tsunami en el Caribe - [Conferencia en Línea SAS](#) Marzo 2
- Caribe Wave 11 y LANTEX 2011 - Un Ejercicio de Alerta de Tsunami en el Caribe - [2da Conferencia en Línea](#) Marzo 3
- Tsunami Travel time [image](#) (4mb)
- Tsunami Travel [timstable](#)

Florida East Coast Participation

- CARIBE WAVE 11/ LANTEX11 Participant Handbook ([Modified for Florida East Coast](#)) March 23, 2011
- [Local Impacts Timing](#) for EIMs
- Tsunami Exercise [Message #1](#) (0802 EDT)
- Tsunami Exercise [Message #2](#) (1001 EDT)
- Tsunami Exercise [Message #3](#) (1031 EDT)
- Tsunami Exercise [Message #4](#) (1131 EDT)



PRESS AND MEDIA

14

- Press releases were sent prior to the exercise at the local and international level
- This helped limit the number of false alarms.
- This helped encourage participation
- Broad coverage of the media during the exercise with at least 60 citations



<http://www.patriagrande.com.ve/temas/venezuela/simulacro-preventivo-de-tsunami-en-anzoategui/>

EXERCISE EVALUATION

15

- On line questionnaire
(<http://nthmp.tsunami.gov/exercise2011.php>)
- 33 completed questionnaires were received from 35 countries
- Of two of the countries, Canada (did not participate) and Peru (member outside the region)
- Two countries participated, but did not fill out the report (Bahamas y St. Eustatius)
- 28 other local and private institutions submitted reports.

Broad Participation

16

- Broad participation with 34 participating countries, excellent considering it was the first time a regional exercise was held.
- Japan's tragedy "helped"



Evacuations in Anguilla (Photo: Elizabeth Klute) and British Virgin Islands

Participating Countries and Territories

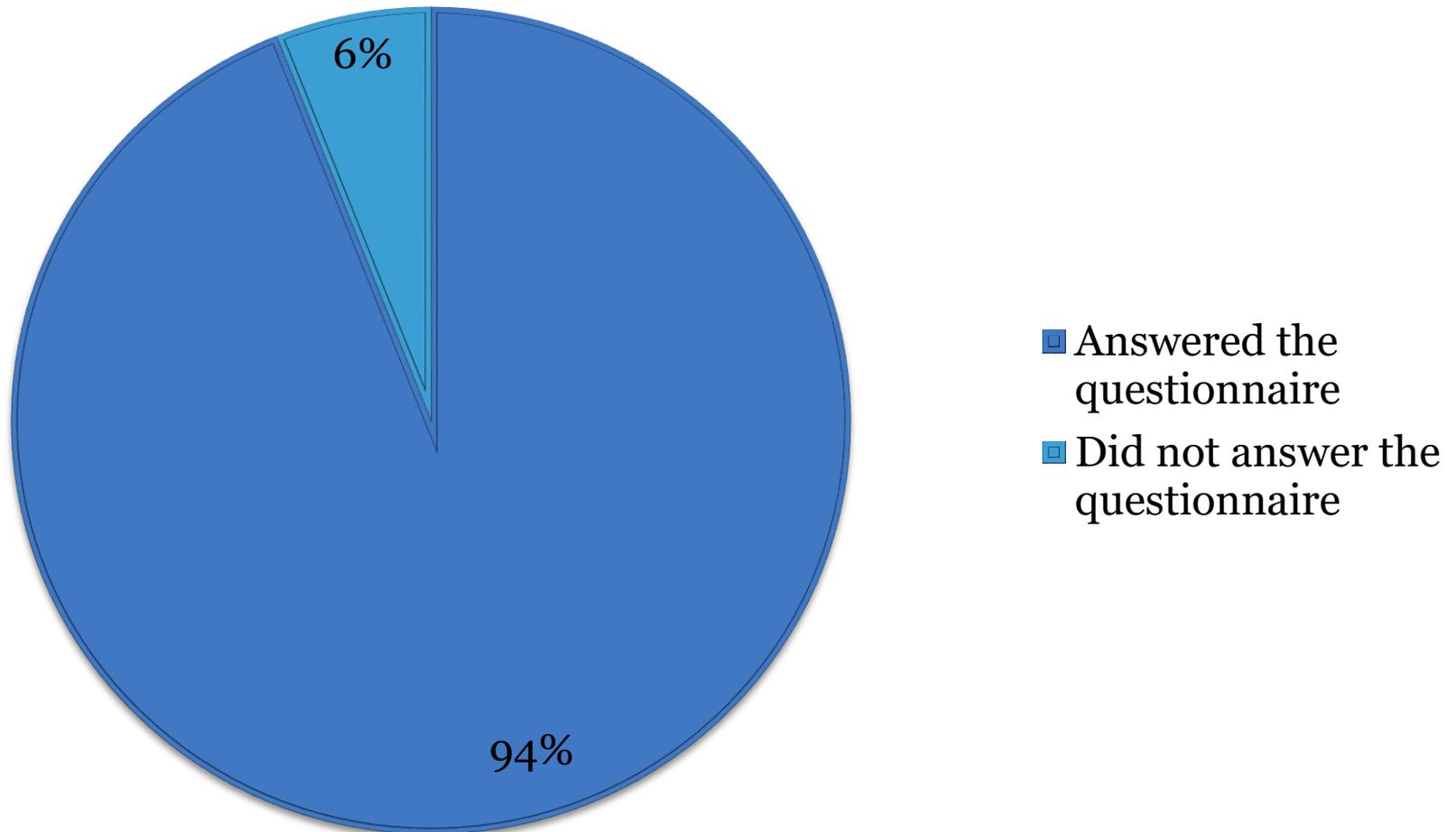
of 44 in Caribbean and AR and 2 outside (Peru, Sri Lanka)

90% Countries that have TWFP and 75% all members



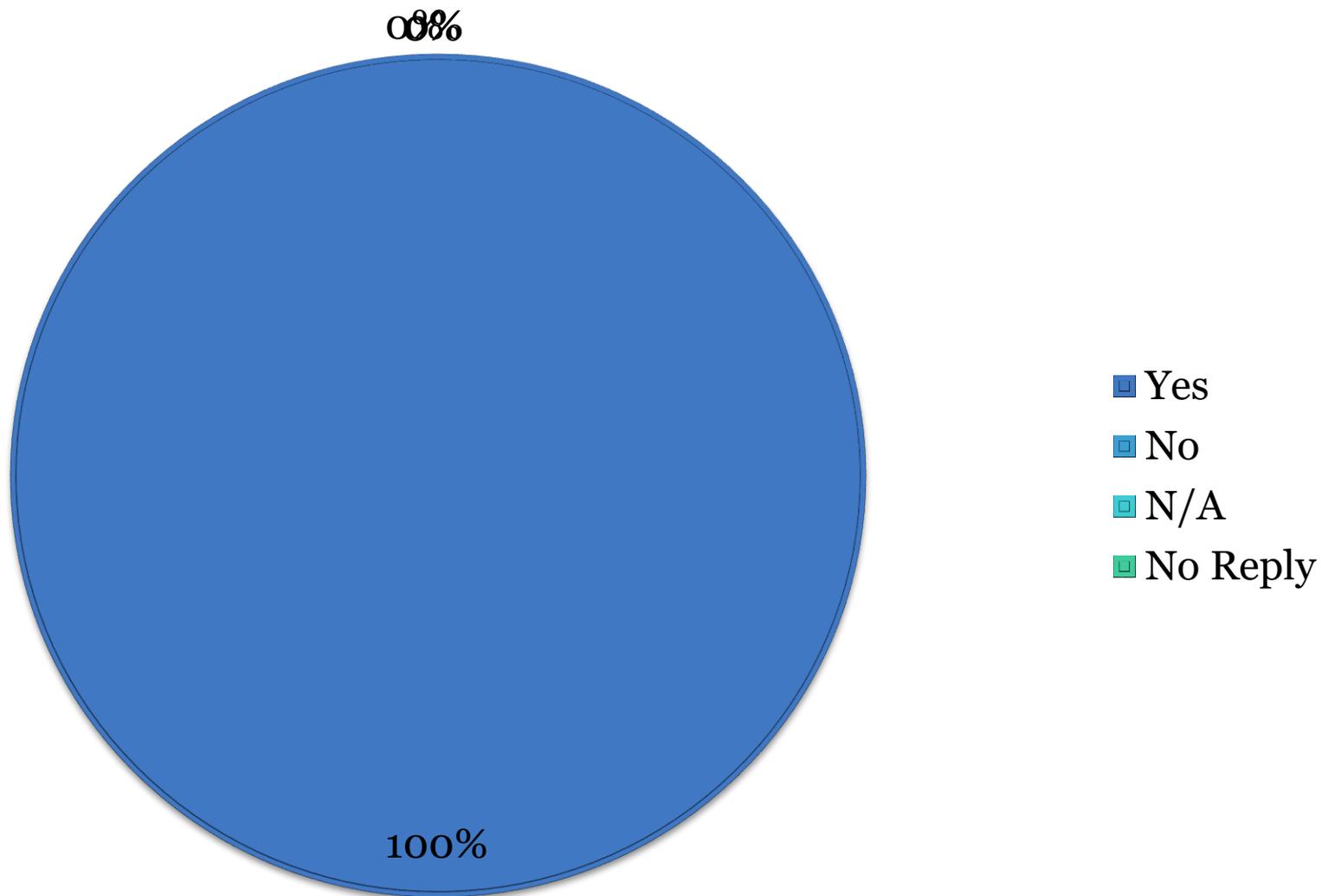
- Participated: Aruba, Antigua and Barbuda, Bahamas, Barbados, Belize, Bolivarian Republic of Venezuela, Colombia, Curacao, Dominica, Dominican Republic, France (Martinique, Guadeloupe, St Martin), Grenada, Guatemala, Haiti, Honduras, Jamaica, Mexico, Netherlands (Sint Eustatius), Nicaragua, Panama, Peru, Saint Lucia, Saint Vincent and the Grenadines, Sint Maarten Trinidad and Tobago, United Kingdom (Anguilla, British Virgin Islands, Bermuda, Cayman Islands, Turks and Caicos), United States (Puerto Rico and the US Virgin Islands).
- Did not participate (no designated TWFP/TNC at time of exercise): Cuba, Guyana, France (Guyane), Brazil, Suriname, Montserrat, Netherlands (Saba, Bonaire)
- Did not participate: Costa Rica, Canada (did confirm later that messages were received)

CARIBE WAVE 2011 Questionnaire Participation (Out of a total of 32 participating countries)*

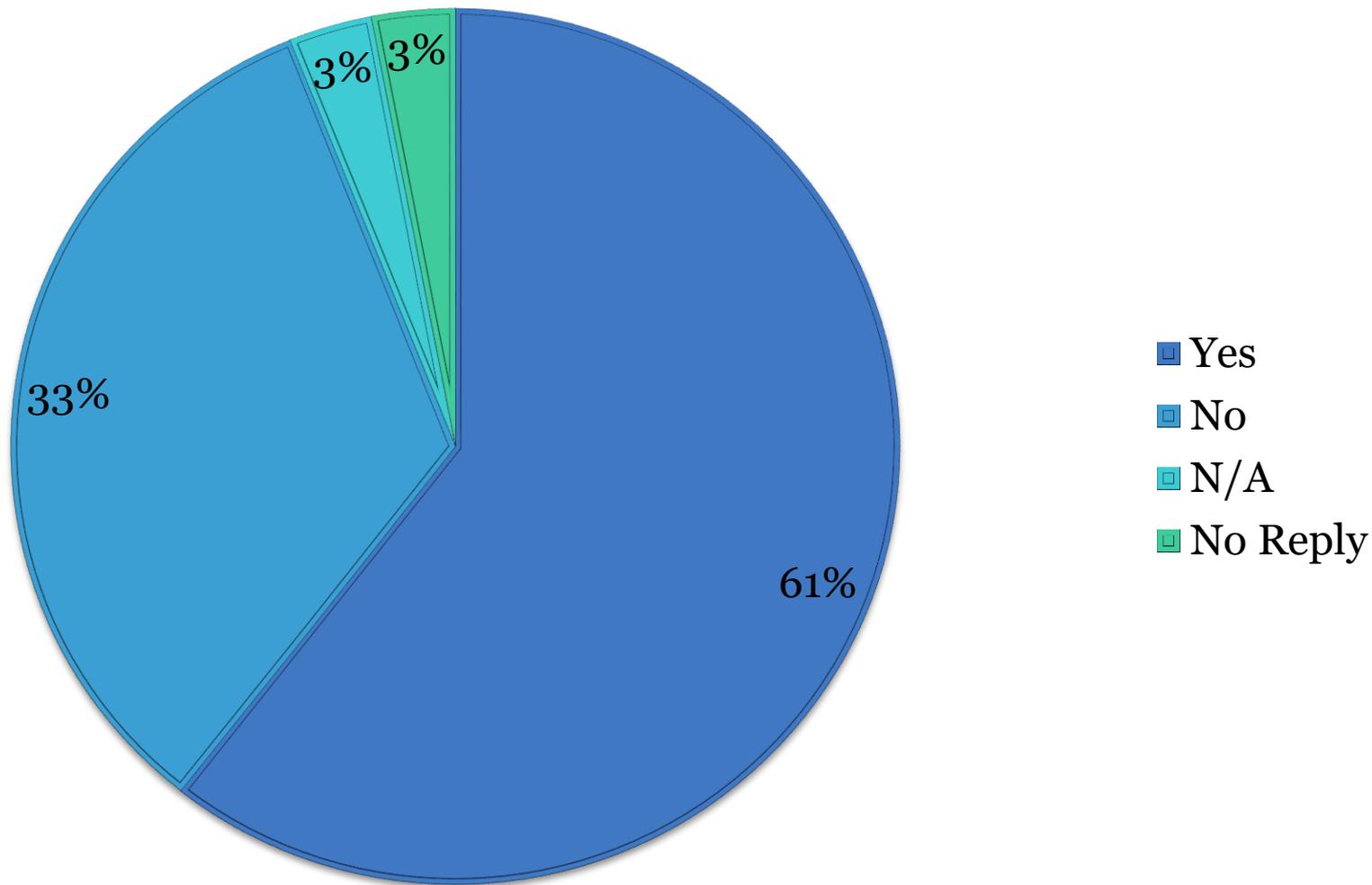


* There were 34 participating countries, but France only answered one questionnaire which included Martinique, Guadeloupe, and St. Martin, so they were taken under consideration as if it were only one, which lowered the number of participating countries to 32.

1.b. Did other national/state/territorial agencies participate in the exercise? Please list.

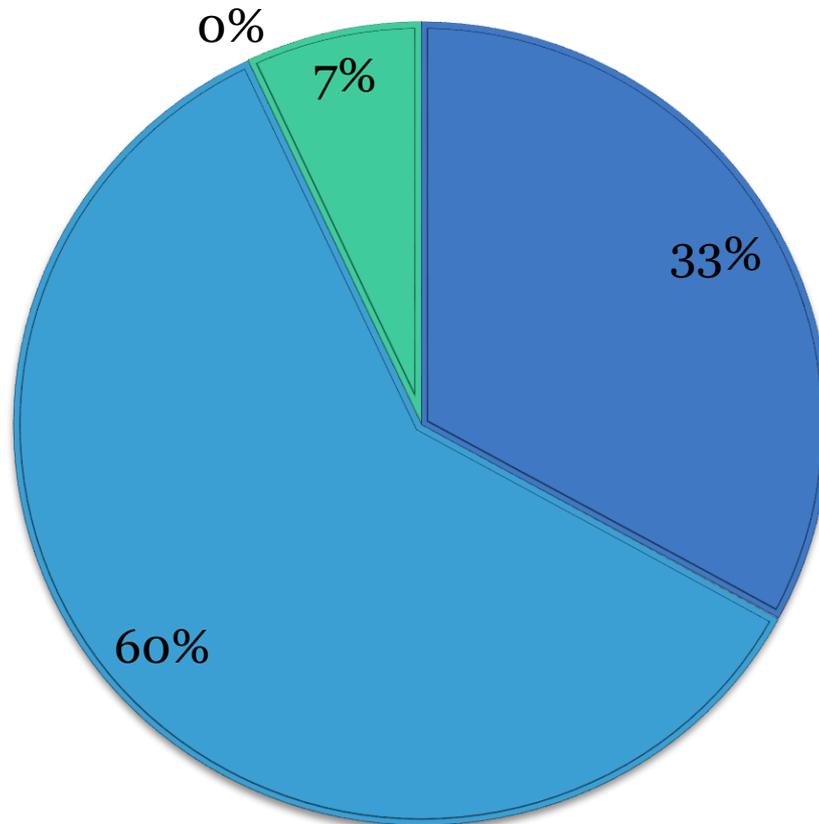


1.c. Did local agencies/communities participate in the exercise?



1.d. How many schools participated in the exercise?

188 schools (3 countries did no indicate number and 2 countries (Antigua and Barbuda and Turks and Caicos) indicated all schools

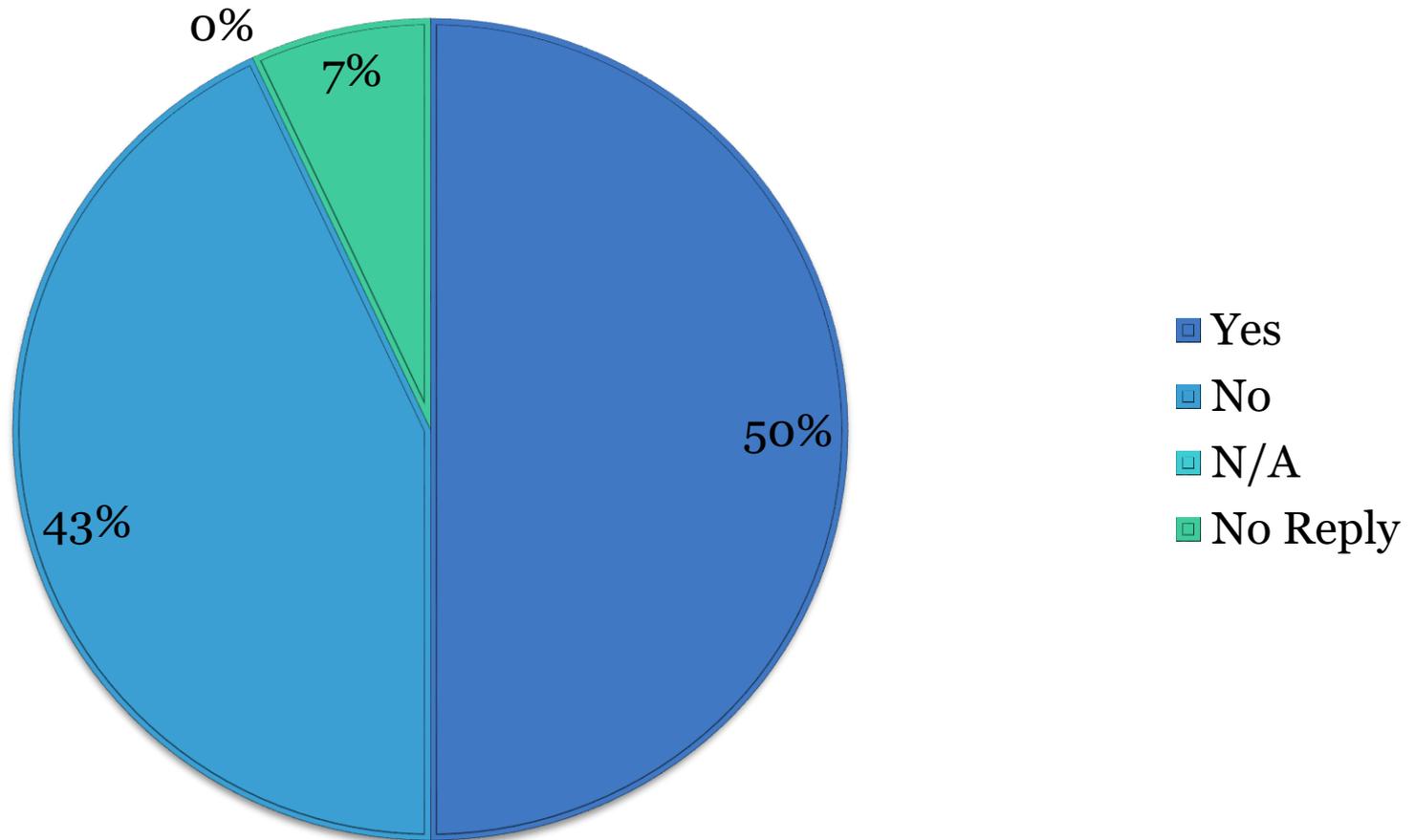


- Yes
- No
- N/A
- No Reply



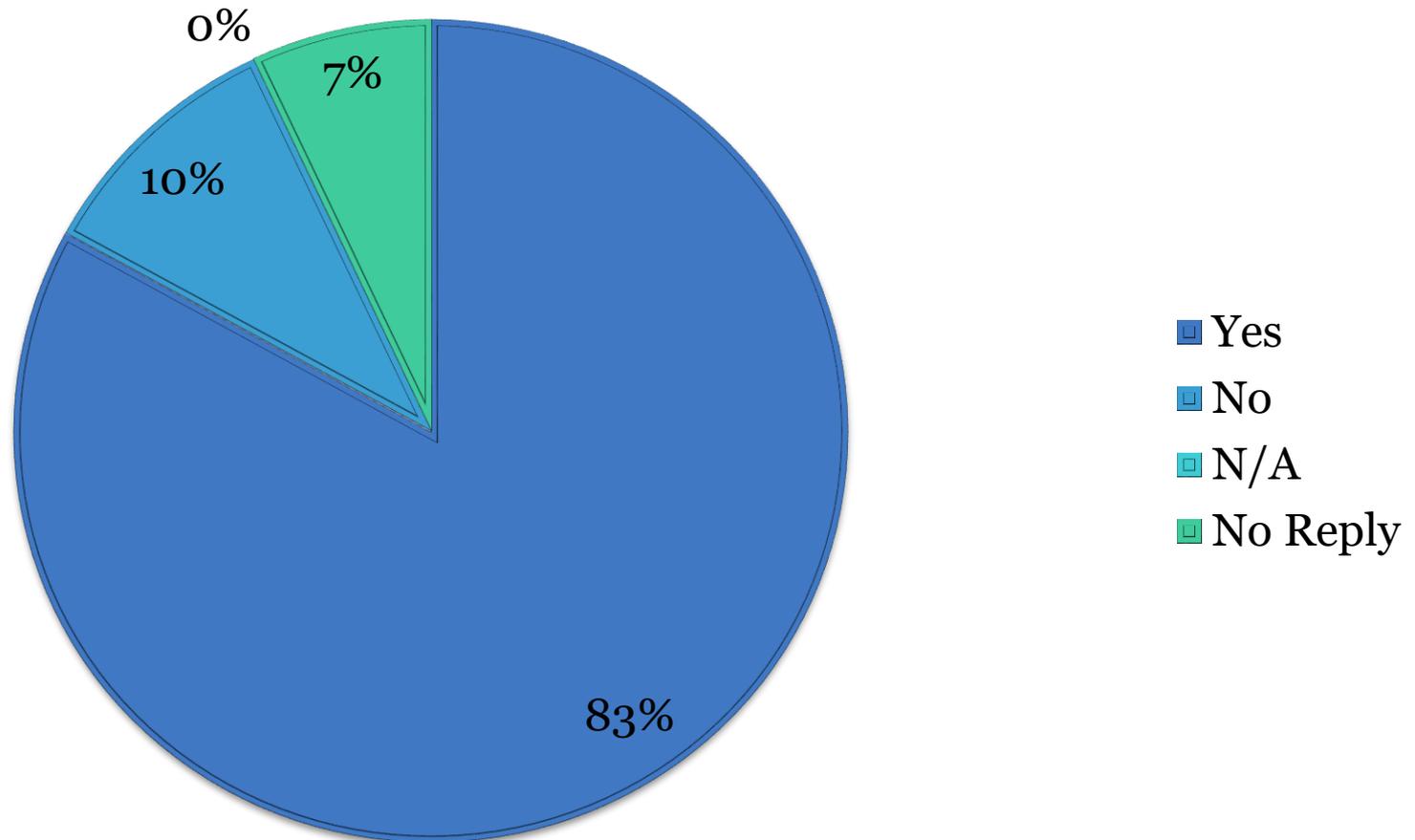
1.e. How many private entities participated in the exercise?

139 private entities (hotels, port operators, media outlets)

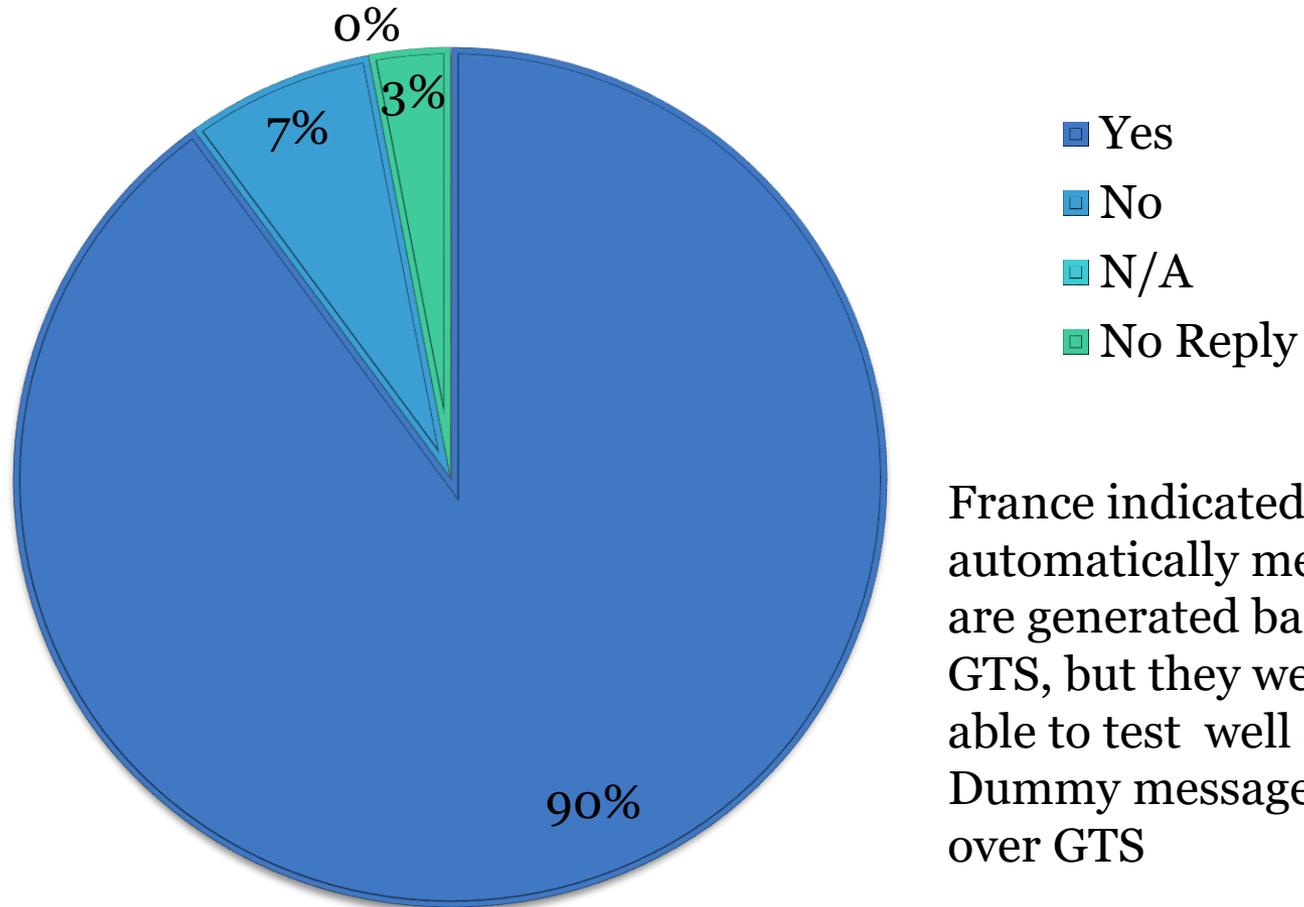


2. Was the exercise format satisfactory?

Some countries commented that they found the use of two events confusing, problems with translation of alert levels in text



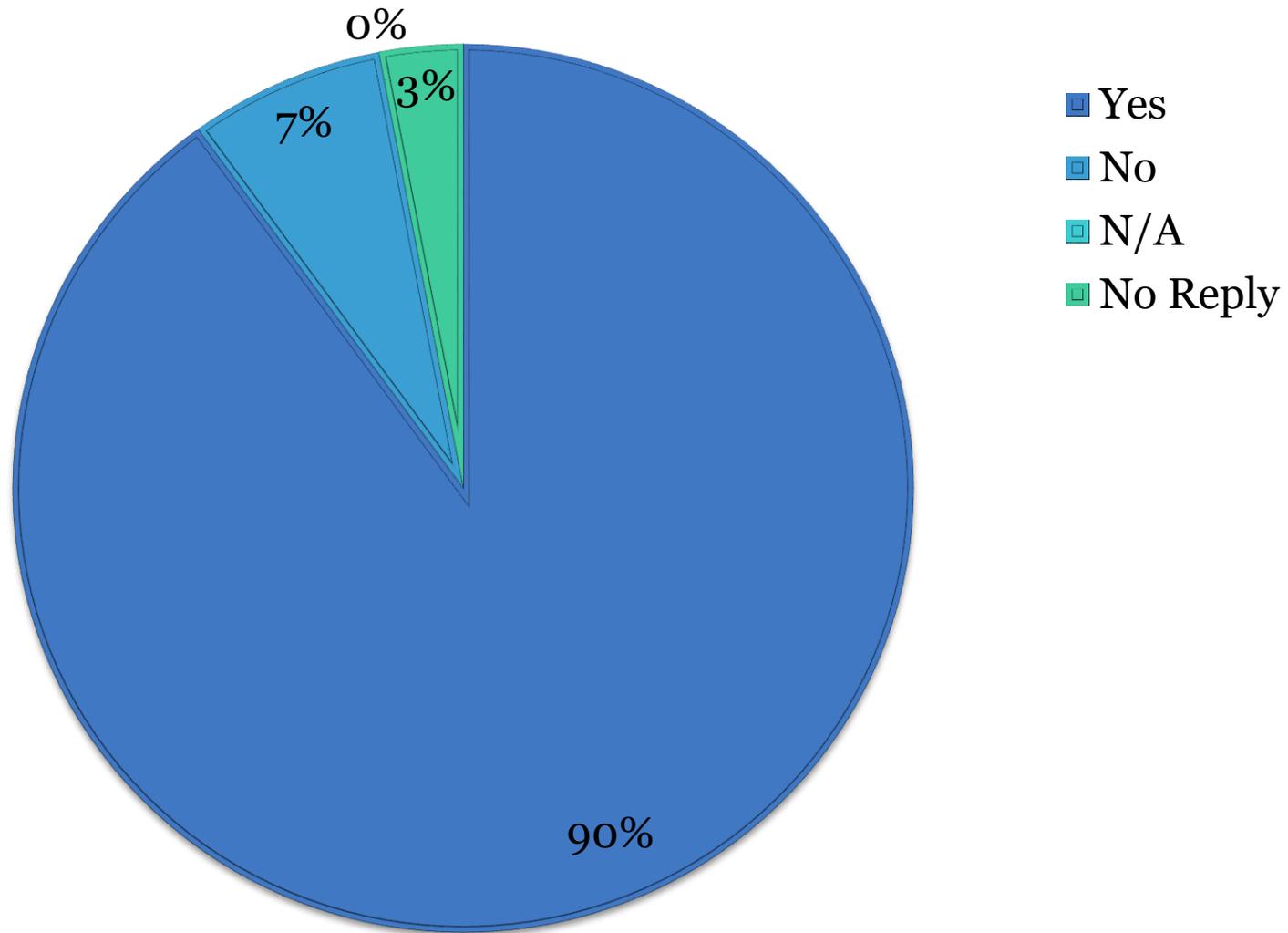
3. Did you receive the "dummy" message from the WCATWC or PTWC to start the exercise? If so, through what channel(s) and approximately what time was it received?



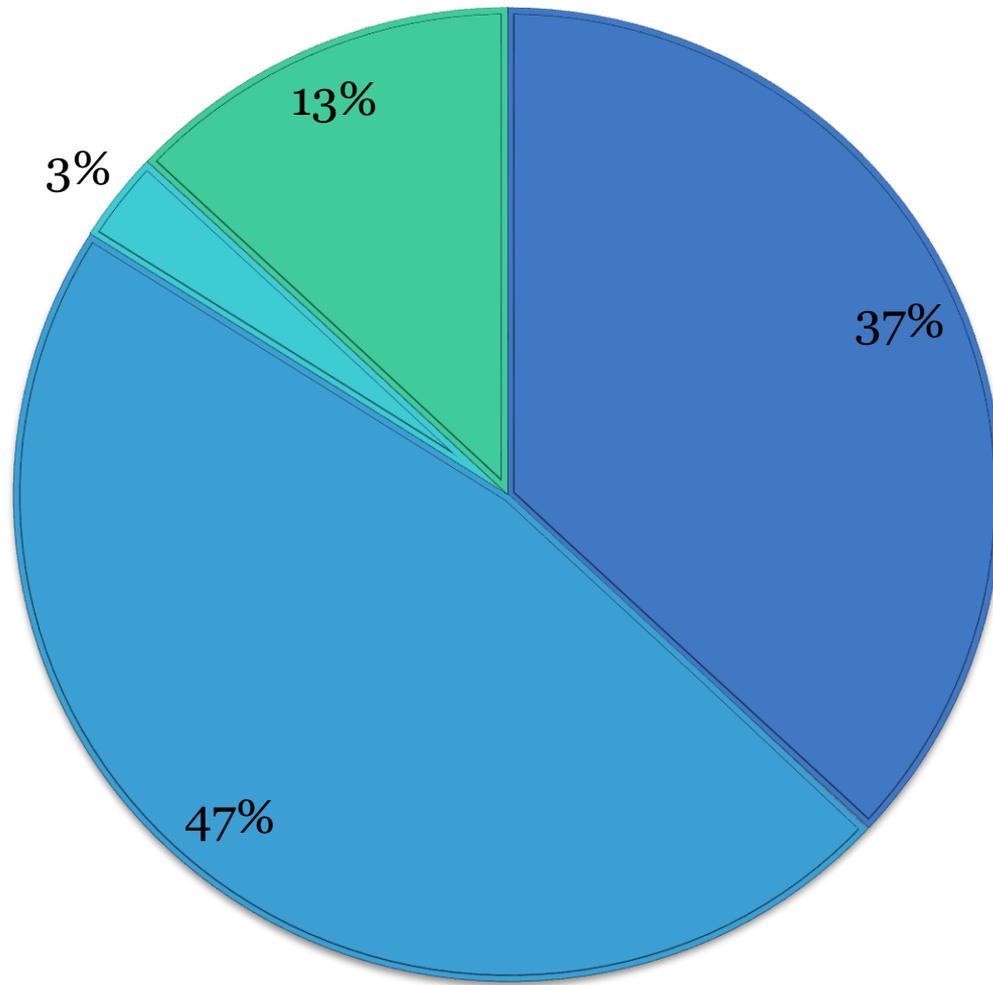
Email: 16
Fax: 12
Phone: 3
EMWIN: 3
GTS: 3
AFTN: 1
EAS: 1

France indicated that automatically messages are generated based on GTS, but they were not able to test well as only Dummy message went over GTS

4. Was the content and intention of the tsunami message clear?



5. Should any other content be added to the messages, or was any superfluous?

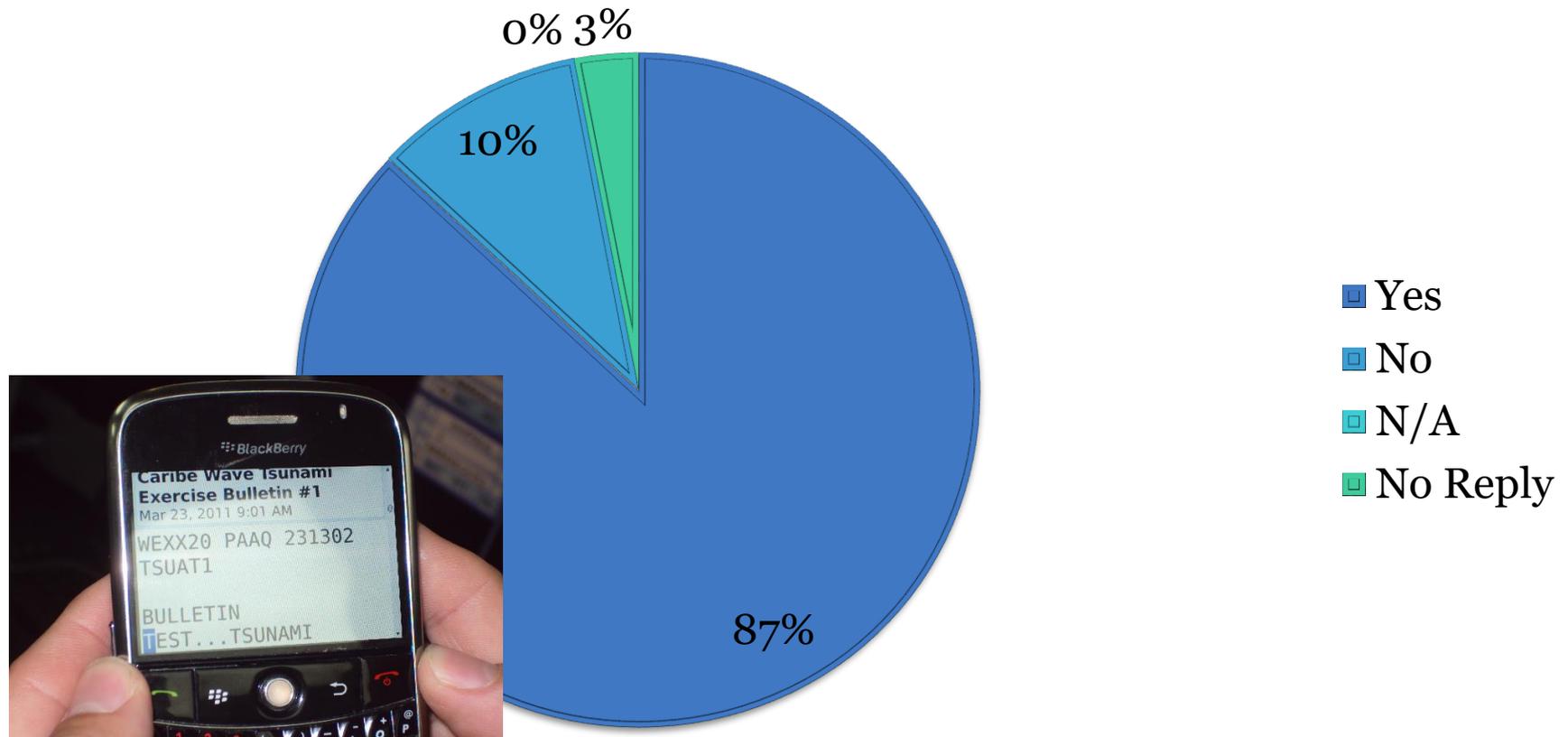


- Yes
- No
- N/A
- No Reply

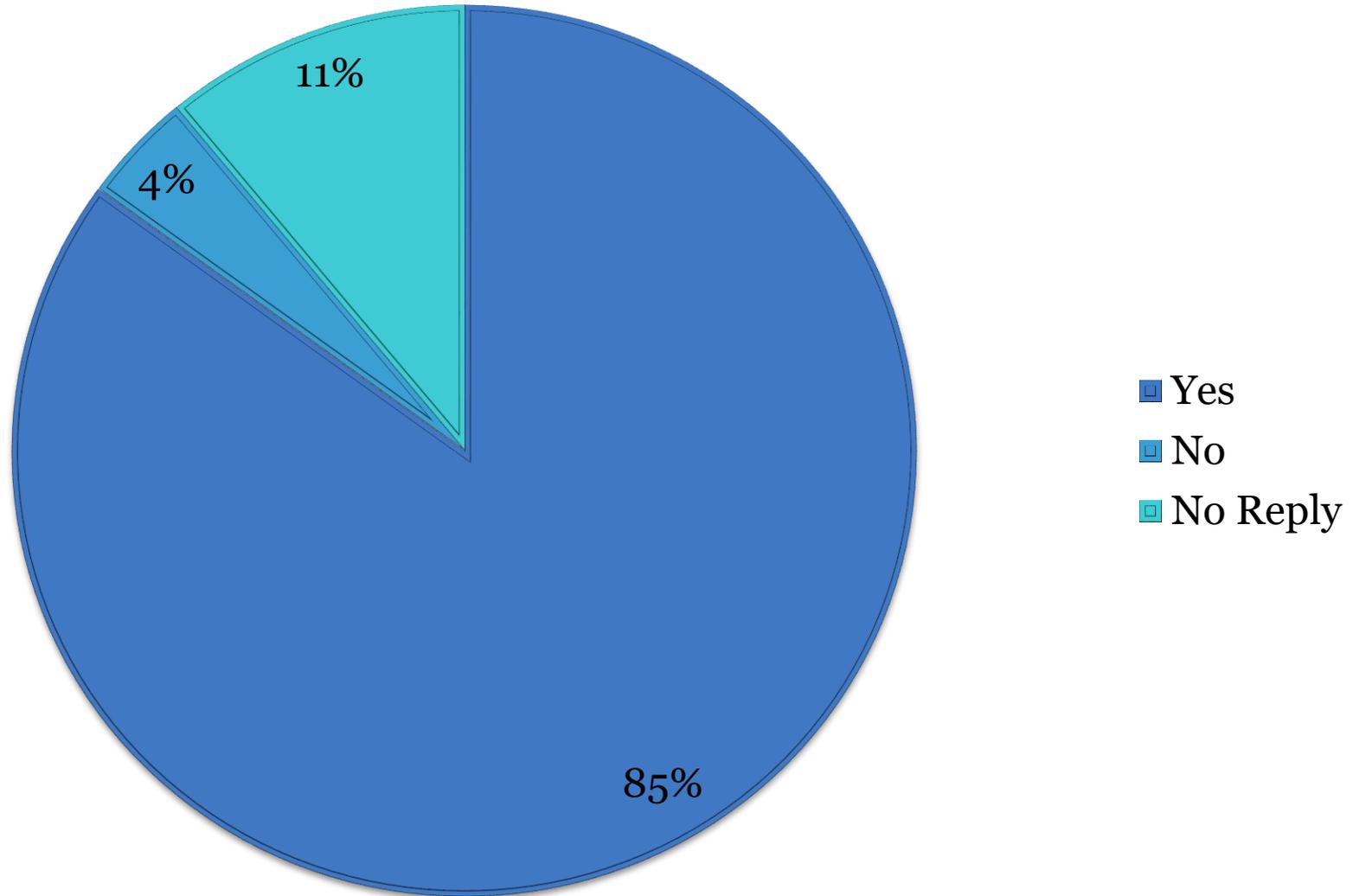
- Should also be in Spanish and French
- Confusion with the terms for alert
- More Detail on impacts
- Countries not listed
- Like information on line, like WCATWC

6. If you participated in CARIBE WAVE 11/LANTEX 11, did you receive the email messages that were issued by the WCATWC and/or PTWC during the exercises?

Over 300 institutions registered to receive Emails, almost 50% of these from France

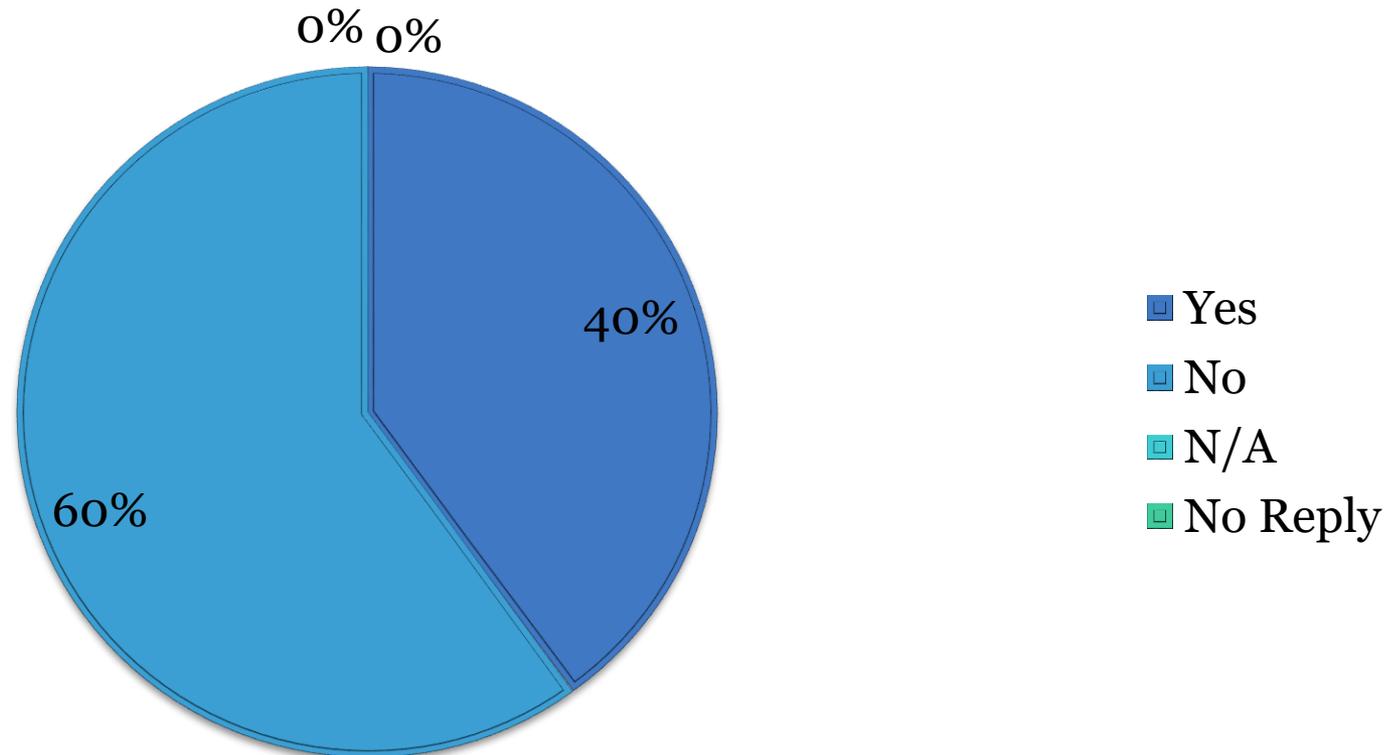


6.b. Were these helpful?

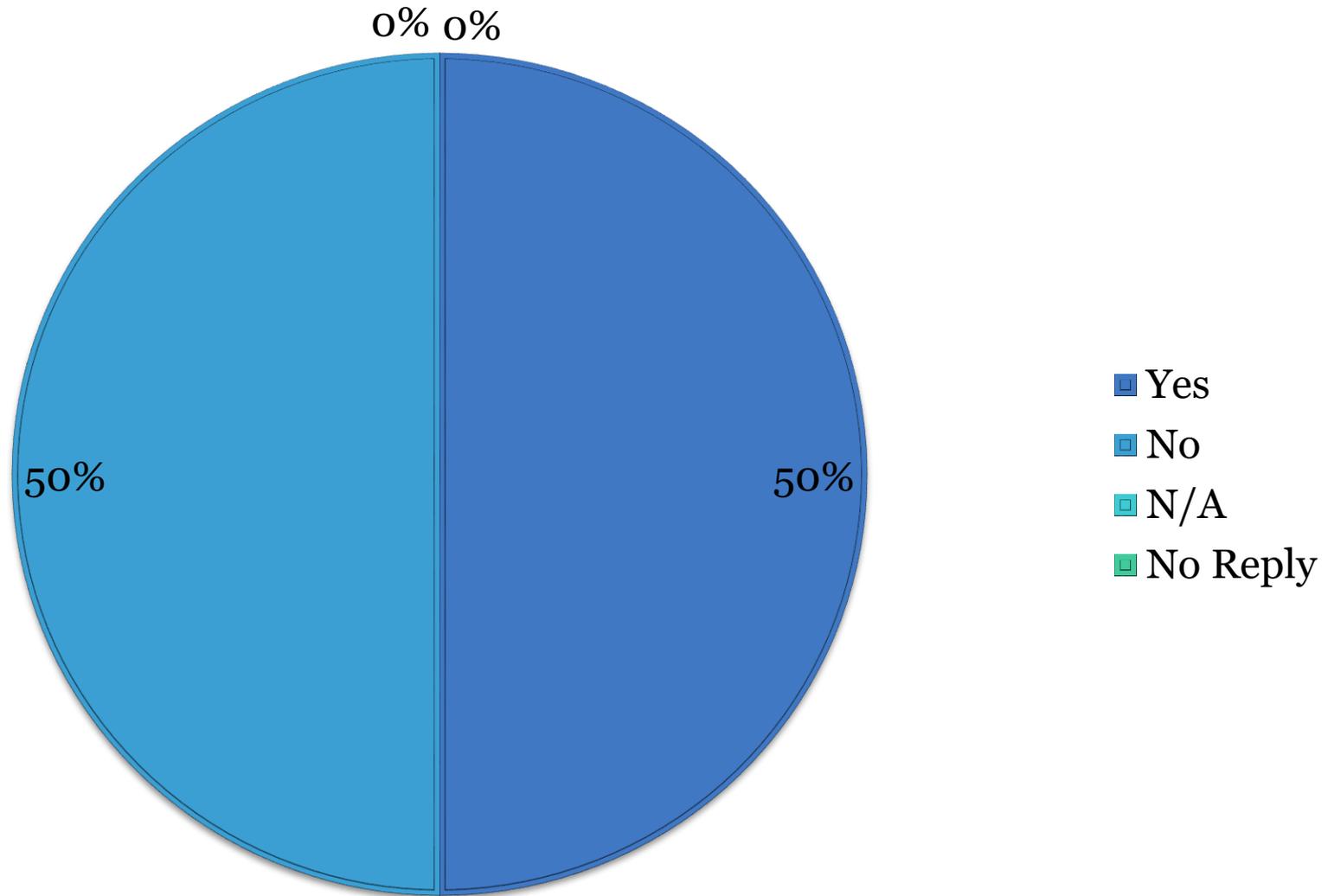


7. Did you receive any message from an organization other than the WCATWC and/or PTWC? Please list agencies that issued products during the exercise.

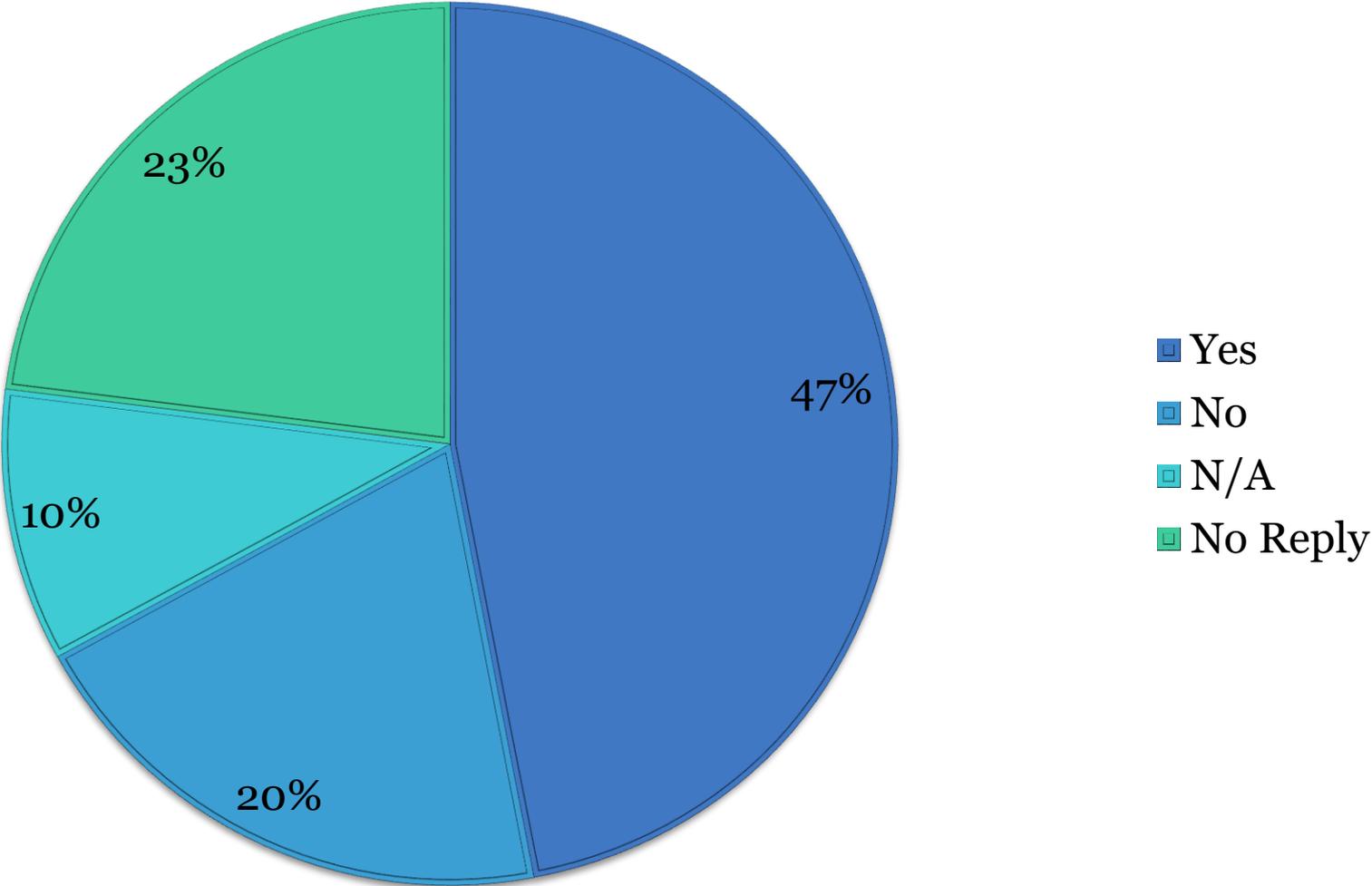
CDEMA, PRSN, INETER, Panama Geoscience Institute, FUNVISIS, Met Services, Navy, Emergency Management, Poli



8. Did your agency have a tsunami response plan in place prior to the exercise?



9. If so, was the response plan adequate to address the event?



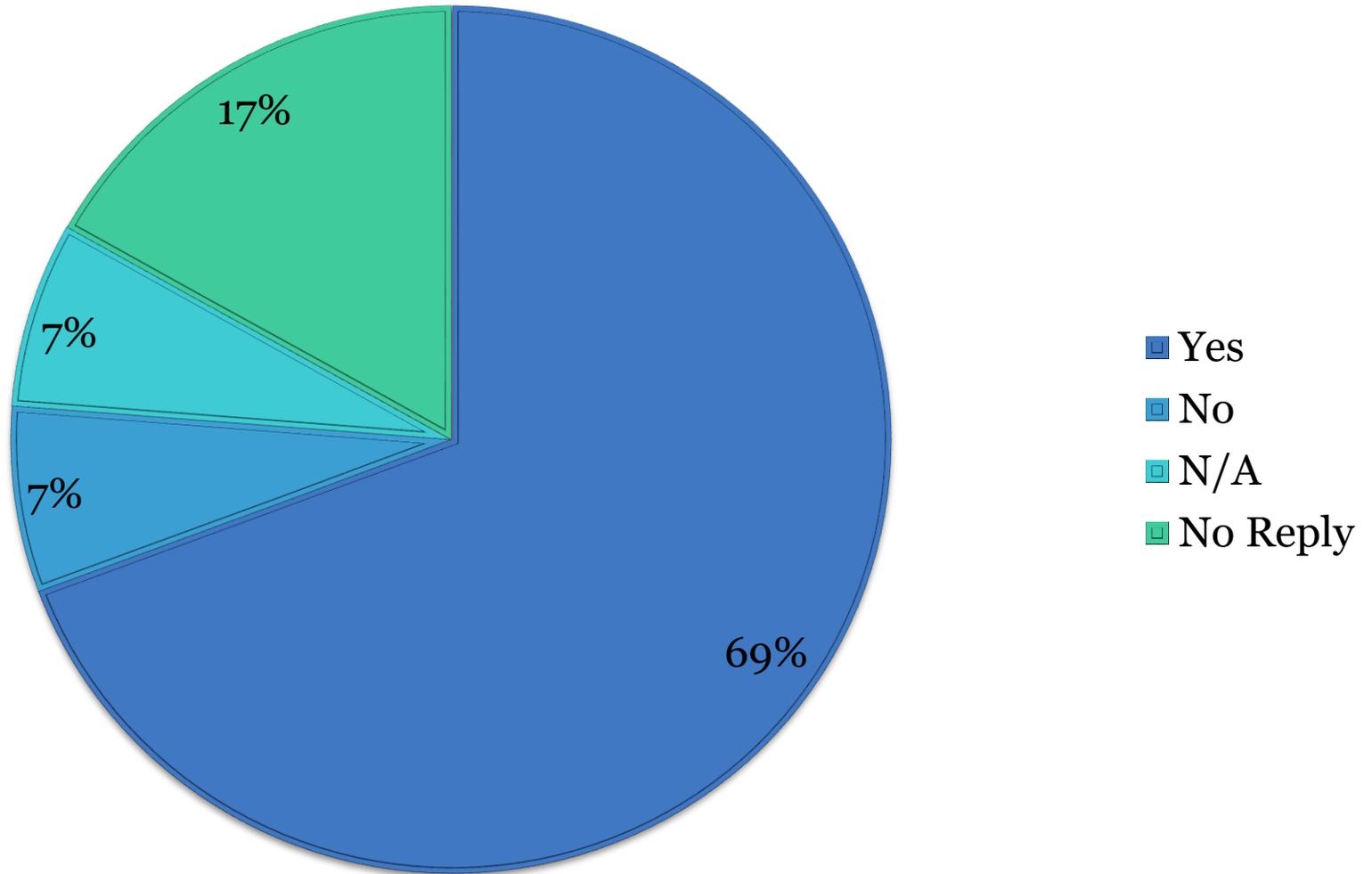
10. Types of Activities

32

- Tabletop Exercises
- Communication exercises
- Activation of EOC's
- Seminars
- Workshops
- Drills
- International Observers



11. Were the emergency management actions during the event clearly laid out by the plan?



12. In a Real Event, How are the Alerts Disseminated to the Population



- Radio, TV, Cable TV: 15 (PR Media Tool Kit)
- SMS: 5 (Incl. USVI VI Alert)
- Sirens: 3 (Many countries indicated plans/desire to install sirens)
- Phone calls: 3
- Email: 2
- Word of mouth: 2
- Loudspeakers on emergency vehicle: 2
- Social Media: 2

Local Dissemination

35

- Activation of the EAS on radio and TV was 99% effective in Puerto Rico. Significant improvement over 2010.
- NOAA Radio activation. Some problems, but much fewer than 2010



Local Dissemination Text Messages

36

- SMS were tested.
- Many reported problems (Puerto Rico this was a major issue)
- In Puerto Rico the cell phone companies did not have the capability to disseminate in real time to all its users.



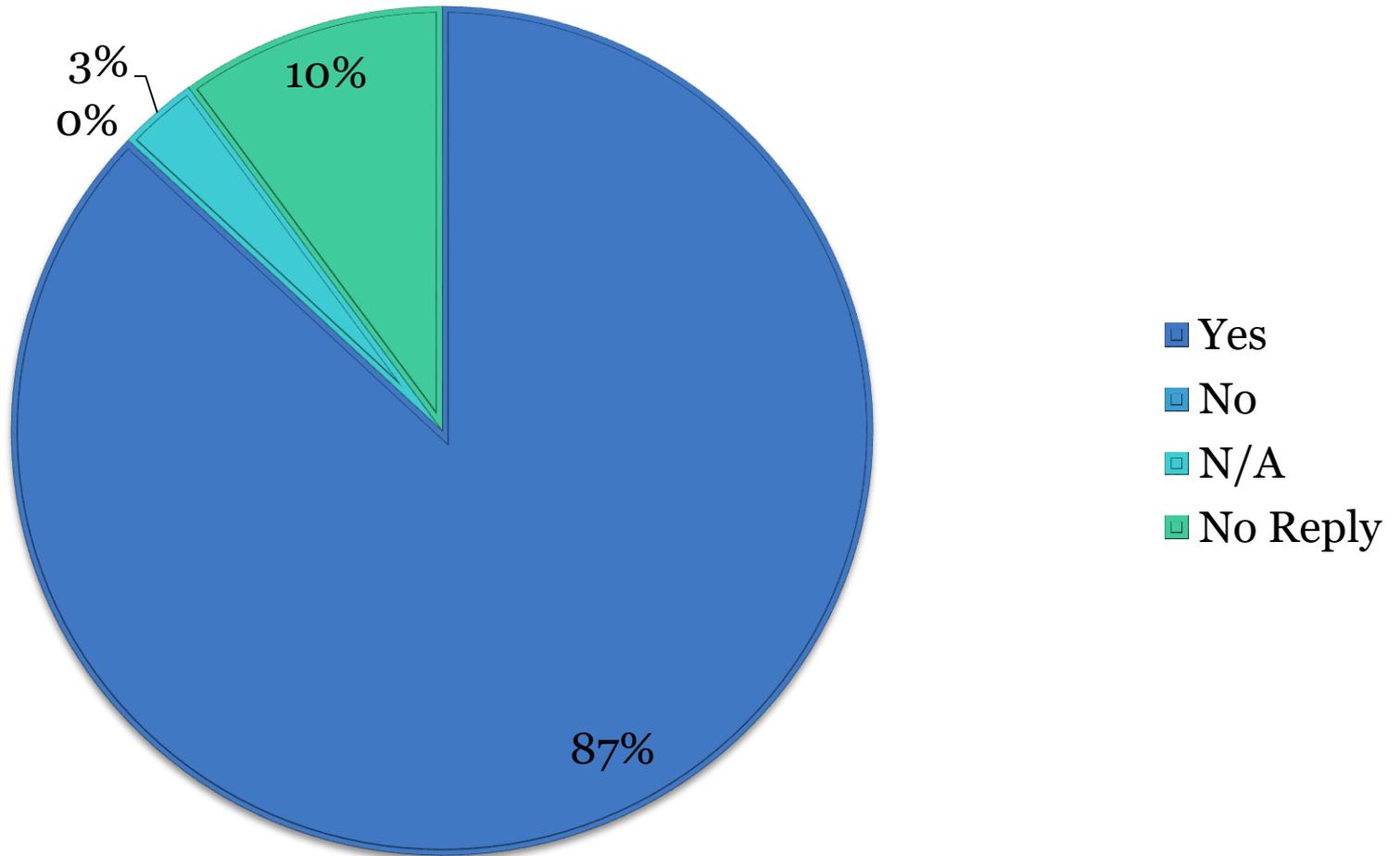
Local Dissemination Tests

37

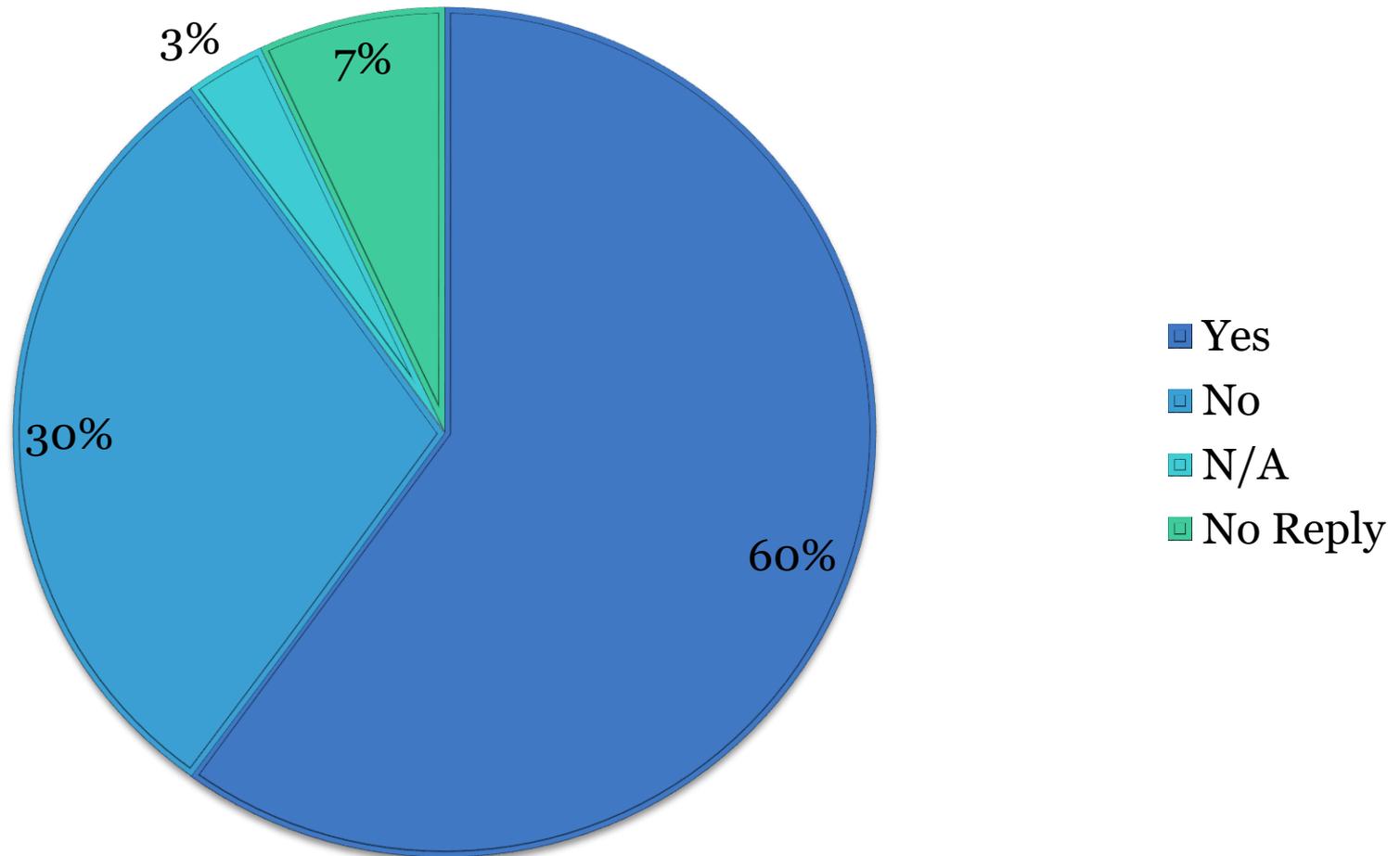
- **Activation of sirens**
 - In Puerto Rico there are 10 which cover a radius of 1 mile (1.6 km)
 - Not all were activated simultaneously.
 - Complaints that they could not be heard well, but people had unrealistic expectations
 - Different tones and messages are used.



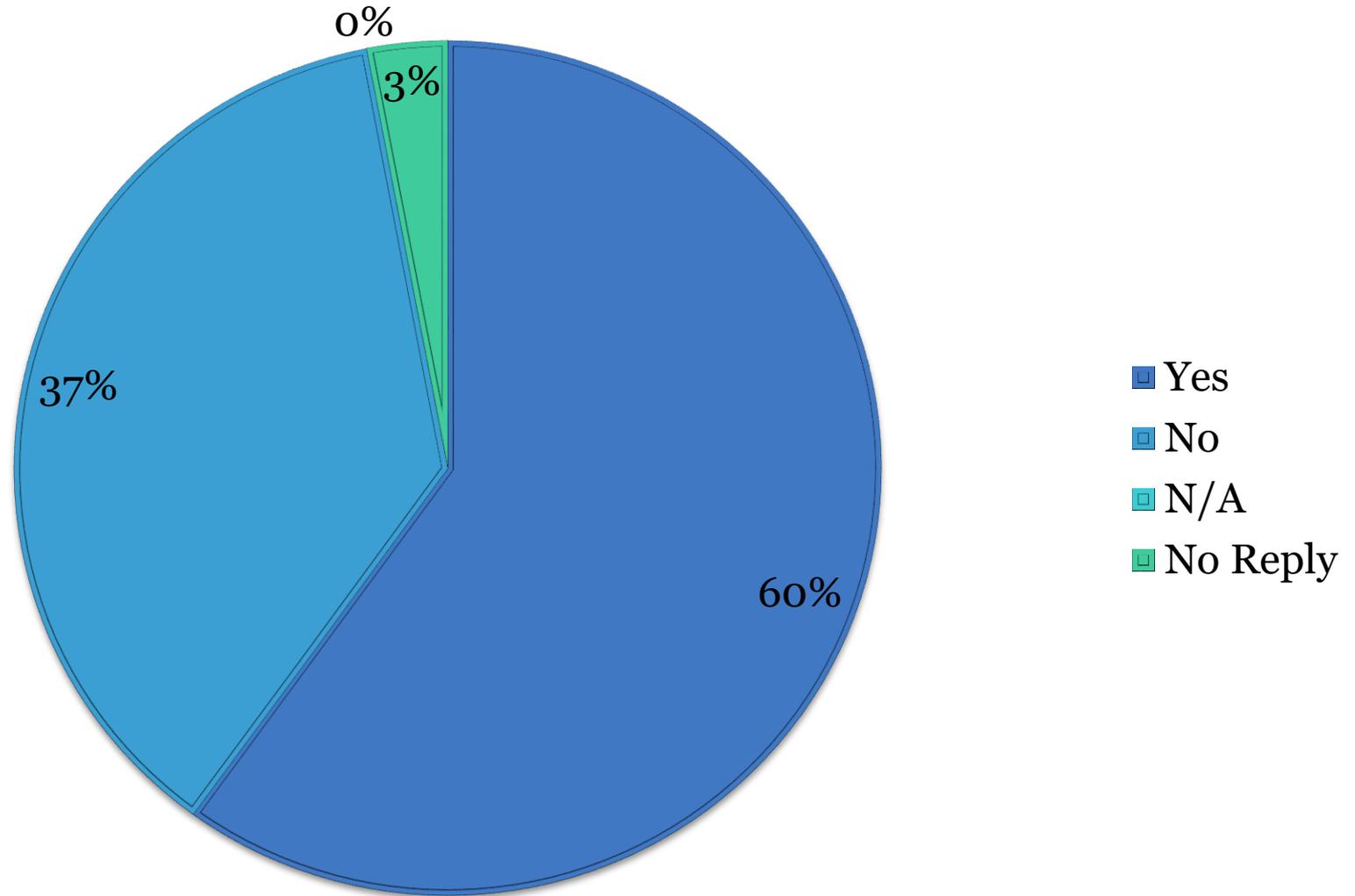
15. Was the exercise helpful in validating the response plan or showing that it was not sufficient?



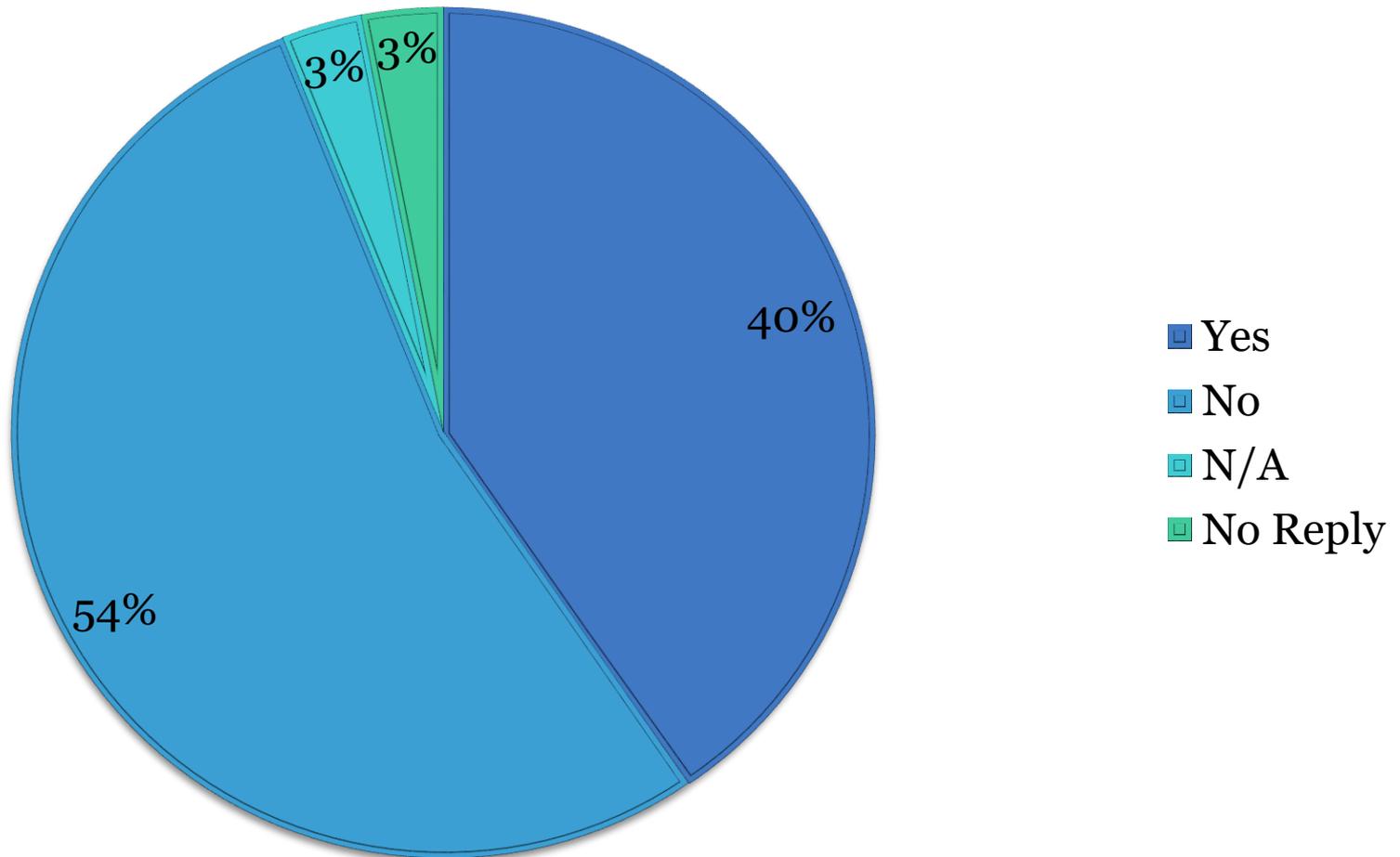
**13. Was any feedback received from the public?
Media involvement, few reported false
messages circulating,**



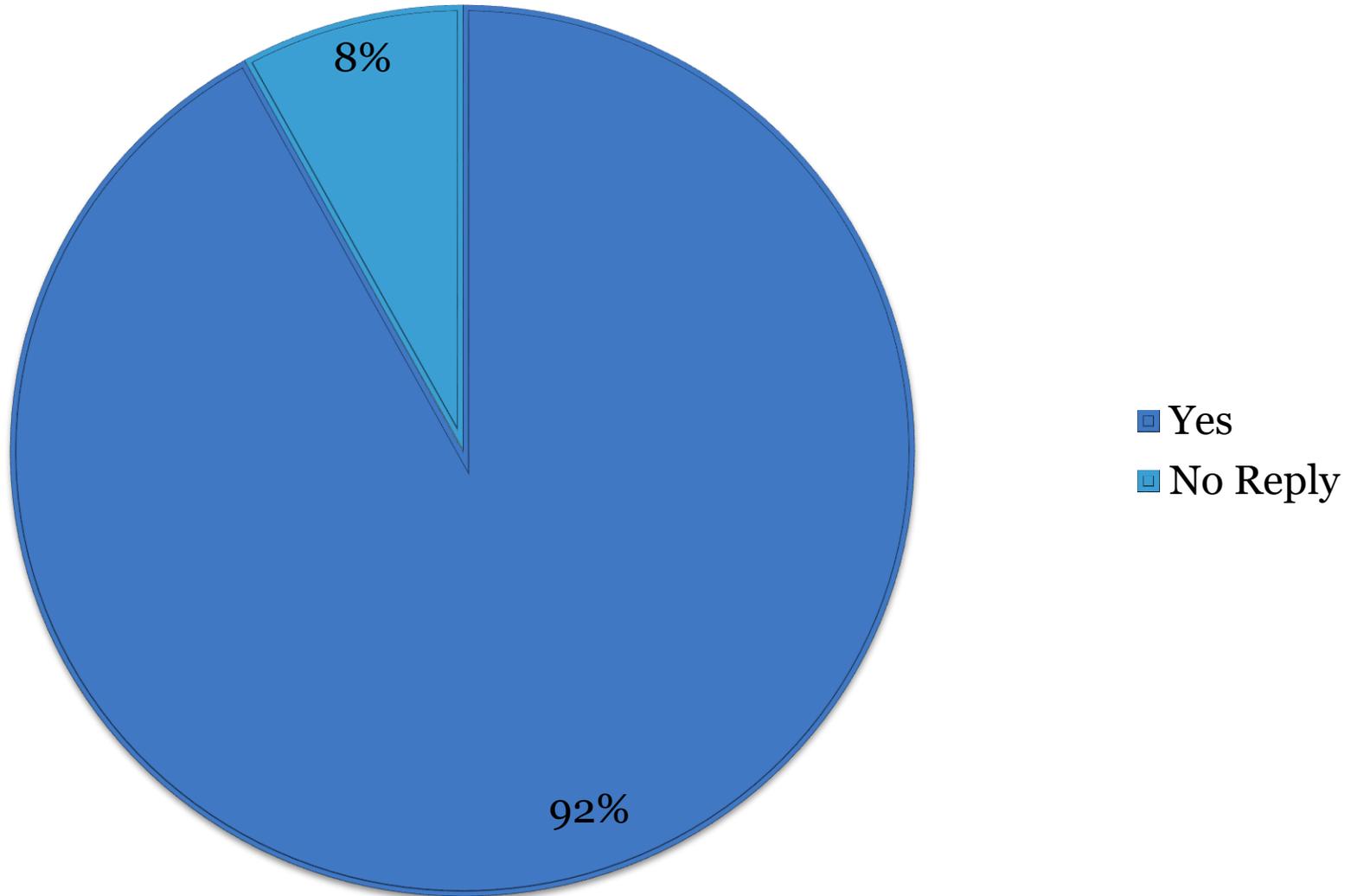
14. Are the potential tsunami danger zones known in your area?



16. For participants of CARIBE WAVE/LANTEX 2011. Did you participate in the Webinars prior to the exercise?



16.b. Did you find these helpful?



Define processes for issuing “**all clear**” messages

43

SANTA LUCIA...

Most exercises were based solely on the tsunami impact and did not include the earthquake impact in the epicentral area...

45



Images from the 2011 New Zealand earthquake, M 6.3



Comments



- Great participation
- Generalized satisfaction with the event
- Most objectives were met
- Excellent coverage of the media
- Gaps in the system were identified
- Alternatives need to be identified at the local level for the reception and dissemination of messages
- Care must be taken with the translation of terms used in the TWC bulletins
- Improvements could be made to the questionnaires

Questions for Discussion



- Do we include in the final report the individual responses of the countries?
- Need pictures for reports...
- Need to strengthen communications
- USA will hold next tsunami exercise, LANTEX on March 21, 2012
- Should CARIBE EWS hold another exercise? When?
- What should the scenarios be?
 - Panama deformed belt
 - East of the Lesser Antilles
- Other elements
 - Work with seismological community to integrate earthquake impact.

Acknowledgements



- West Coast and Alaska Tsunami Warning Center (Paul Whitmore, James Waddell et al)
- Pacific Tsunami Warning Center (Charles McCreery et al)
- IOC Tsunami Unit
- IOC Translation Services
- CEPREDENAC/CDEMA
- NOAA NWS SRH help setting up the webinars
- Participants and contributors in the planning and execution
- Alina Nieves, CTWP