Tsunamis and Other Coastal Hazards for the Caribbean and adjacent regions

Dr.rer.nat. Silvia Chacón-Barrantes
Chair ICG/CARIBE-EWS
Tsunamis

- ~500 years
- more than 75 tsunamis
- killed over 4,000 people
Tropical cyclones 2016-2017

• Still recovery going on, reconstruction has begun
• New understanding for being prepared for the “worst”
• Priority for Community Resilience
• Island and Small State vulnerability
• Good time to promote Vertical Evacuation Design
ICG/CARIBE-EWS

Mission

To facilitate Tsunami Monitoring, Hazard and Risk Assessment, Warning and Public Awareness and Education in the Member States within a coordinated and harmonized regional framework

Vision

All Member States of ICG CARIBE EWS are resilient and prepared for tsunamis and other coastal hazards
Implementation plan

• Adopted for 2018-2023
• Will be used to track ICG goals
• Will be reshaped in terms of Key Performance Indicators (KPI) and Sendai Framework
• Dynamic document
Sessions of the ICG/CARIBE-EWS

- ICG XIII – Curacao, April 24-28, 2018 (13/48 Member States and Territories and 2 Observers)

- Next Meetings
  - 2019: Costa Rica
  - 2020: Aruba
  - 2021: Cuba
New officers elected

• Chair – Silvia Chacón-Barrantes (Costa Rica)
• Vice Chairs
  o Gerard Metayer (Haiti)
  o Mary Rengifo (Colombia)
  o Jasen Penn (BVI)
ICG/Caribe-EWS WG and TT

- **WG 1 - Tsunami Monitoring and Detection Systems** - vacant
- **WG 2 - Tsunami Hazard Assessment** - Nic Arcos (USA)
- **WG 3 - Tsunami Related Services** - Emilio Talavera (Nicaragua)
- **WG 4 - Preparedness, Readiness and Resilience** - Christa von Hillebrandt-Andrade (USA)
- **TT CaribeWave 19** - Elizabeth Vanacore (PRSN-USA)
- **TT Volcanic Activity and potential Tsunamis** - Valerie Clouard (France)
- **TT Tsunami Ready** - Claricia Stevens (Saint Kitts and Nevis) and Jasen Penn (BVI-UK)
- **TT Evacuation Maps** - Norwin Acosta (Nicaragua)
- **Group of Experts for Other Coastal Hazards** - Mark Oduber (Aruba) & Elizabeth Riley (CDEMA-Barbados)
Current Participation in the CARIBE-EWS

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Tsunami Service Provider: PTWC (Pacific Tsunami Warning Center)

- Enhanced (graphical, forecast) products
- TSP for the whole region, incl. Puerto Rico and USVI
Sub-regional TSP: Central American Tsunami Advisory Center (CATAC), Nicaragua

Map display of SeisComP3/TOAST with location and calculated maximum sea level surface height (SSH max - a few cm only) of the M 7.3 earthquake on January 10, 2018, North of Honduras.

Will issue experimental products for CaribeWave19
Caribbean Tsunami Information Center (CTIC)

• Established in 2014 in Barbados thru an MOU between IOC and Government of Barbados

• Conducted numerous trainings and development of education and outreach materials

• Reopened in August 2017 (was closed from Jan 2016-July 2017).

• Appointment by UNESCO IOC of Alison Brome as Programme Officer for Coastal Hazards and the Caribbean Tsunami Information Centre – September 2018

• WG 4 and CTIC explore and document how they should best work together
US NWS Caribbean Tsunami Warning Program (CTWP)

- Established by NOAA NWS in 2010
- Located in Mayagüez, Puerto Rico
- Supports tsunami watch operations, as well as outreach and resilience efforts
- 1 FTE and varying number of students (Currently 4)
- As of 2017 part of ITIC
**GNSS Data for Tsunami Warning**

Figure 2. Earthquake detection capability in the Caribbean for M 7.5, 15 km depth, with current UNAVCO RT-GNSS stations. For any location, at least six stations capable of detecting the event are required for sufficient coverage.

Figure 3. Earthquake detection capability in the Caribbean for M 7.5, 15 km depth, with current UNAVCO RT-GNSS stations plus 135 additional GNSS stations identified in the survey as having data communications suitable for high-rate real time data streams. For any location, at least six stations capable of detecting the event are required for sufficient coverage.
Tsunami Ready

- +200 communities targeted by MS to be TR
- TT working on pre- and post-evaluation instruments to measure the social impact of the pilot CARIBE EWS Tsunami Ready
4 CARIBE-EWS Tsunami Ready
12 in progress (DIPECHO & USAID)

1 PTWS Tsunami Ready
4 in progress
Tsunami evacuation maps

• Declared a priority for the region in 2017

• TT identifying funding for a training workshop for Tsunami Inundation Maps and Tsunami Evacuation Maps and/or TEMPP for the Caribbean Region

• Strong need for coastal HR bathymetry
Non-tectonic Tsunami Sources

• TT on Volcanic Sources for Tsunamis since 2016
• Scenarios to be included in CATSAM
• For the first time CaribeWave19 will include a volcanic scenario
Group of Experts Other Coastal Hazards

- To develop and recommend to the ICG/CARIBE-EWS a strategy, actions and implementation plan to enhance the warning system by including other coastal hazards.

- Take advantage of existing observational resources, in agreement with Sendai Multi Hazard framework, optimize national and local resources.

- Met Nov. 2018, Colombia

- Considers threats
  - Meteorological
  - Geological
  - Biological
Tsunami related services

- Integration of social media experts as part of the national alerting systems
- Diversification of communication systems to guarantee the redundancy of communications methods available between the Tsunami Service Provider, the TWFP and the national tsunami warning center, and for national and local dissemination
  - Comms were completely down during and after Maria and Irma
Public awareness, education & resilience

• Technical guidelines on “How to prepare, conduct, and evaluate a community-based tsunami response exercise” now finished and available

• WG 4 will develop an inventory of tsunami evacuations signs and symbols used in the region as well as internationally (including the ISO 20712) with the objective of making a recommendation to the ICG on tsunami signage within the Caribbean
CARIBE WAVE 18

• 643,403 participants in CARIBE WAVE 18

• 3 scenarios from which the Member States chose from (Barbados, Colombia and Puerto Rico)

• All 32 Member States and 15/16 Territories

• Communication systems between PTWC and MS Tested

• National and Local Standard Operating Procedures were tested

• Use of www.tsunamizone.org for registrations
CaribeWave19

- Will be held on 14 March 14 UTC
- 2 scenarios
  - North Panamá Deformed Belt
  - Kick’em Jenny eruption
- +110k people already registered
THANKS!

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