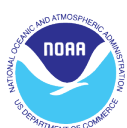




Caribbean
Tsunami Warning
Center



International
Tsunami Information
Center



National Oceanic
and Atmospheric
Administration



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission



A Government of Barbados –
UNESCO/IOC
Partnership



Ministry of Foreign Affairs

UNESCO/IOC – NOAA International Tsunami Information Center ITIC TRAINING PROGRAMME (ITP) – INTERNATIONAL

Regional Training Workshop on Pacific Tsunami Warning Center Enhanced Tsunami Products for ICG/CARIBE EWS

31 October – 02 November, 2017

Radisson Cartagena Ocean Pavillion Hotel, Cartagena, Colombia

Hosted by the Caribbean Tsunami Information Center (CTIC)

Supported by UNESCO/IOC, the Kingdom of the Netherlands, the Colombian Ocean Commission (CCO), UNESCO/ IOC Regional Secretariat for IOCARIBE, Cartagena, Colombia, and the Coastal Zone Management Unit (CZMU), Barbados

Trainers:

Dr. Stuart Weinstein, Deputy Director, Pacific Tsunami Warning Center (PTWC)
Christa von Hillebrandt-Andrade, Manager, Caribbean Tsunami Warning Programme (CTWP)
Alison Brome, Interim Director (ai), Caribbean Tsunami Information Centre (CTIC)

Organizers:

Alison Brome, Interim Director (ai), CTIC
Bernardo Aliaga, Programme Specialist, Tsunami Unit, UNESCO/IOC
Dr. Laura Kong, Director, International Tsunami Information Center (ITIC)
Patricia Wills Velez, Office of the Head IOC-UNESCO Regional Secretariat for IOCARIBE
Lily Charles, UNESCO/IOC

This three-day training workshop is intended to enable tsunami warning focal points (TWFPs), national tsunami warning centers (NTWC), and tsunami emergency responders (TERs) to effectively receive, analyse and take appropriate action in response to the Pacific Tsunami Warning Center (PTWC) enhanced tsunami forecast products for the Caribbean and its adjacent regions. This training workshop will cover tsunami warning operations and the use of the PTWC Enhanced Products for tsunami threat decision-making, with specific attention on the tsunami warning chain and their standard operating procedures (SOPs).

Topics will include warning and response SOPs and challenges, warning decision support tools, warning messages and alerting, evacuation concepts and planning, and awareness strategies. Over the last 10+ years, with improvements in data quality, quantity, and real-time availability,

PTWC's response time has dropped significantly from an hour to 5-10 minutes for tsunami events. At the same time, with each great earthquake and tsunami since the 26 December 2004 Indian Ocean earthquake and tsunami helping to increase scientific understanding, better techniques have been developed to quickly characterize the earthquake and numerically model the tsunami. In the Pacific, the PTWS adopted use of the PTWC enhanced products based on numerical forecast models on 1 October 2014. For the Caribbean and adjacent regions, the changeover to PTWC's new enhanced forecast products was approved by the ICG/CARIBE-EWS VIII (2013), introduced in CARIBE WAVE 2013, and issued in parallel from October 26, 2015. The changeover to solely the new products took place on 1 March 2016.

Due to the impacts of meteorological events during the 2017 hurricane season, lessons to be learned, particularly in relation to communications, will also be discussed.

PROVISIONAL AGENDA

Sess ion	Start Time	End Time	Topic	Speaker
			Tuesday, 31 October 2017	
			MORNING - Opening, ICG/CARIBE-EWS-XII, Tsunami Early Warning	
	08:00	8:30	Registration	CTIC, IOCARIBE
1.1	08:30	8:50	Opening Ceremony	CTIC, IOCARIBE, CTWP, PTWC
	08:50	9:15	GROUP PHOTO, COFFEE / TEA BREAK	
1.2	09:15	9:30	Logistics and Administrative Items, Introductions	Alison Brome, CTIC
1.3	09:30	09:40	Course Overview	Alison Brome, CTIC
1.4	09:40	09:50	ICG/CARIBE EWS-XII Outcomes	Alison Brome, CTIC
2.1	09:50	10:30	Responding Rapidly and Effectively: Tsunami Warning and Emergency Response Requirements and Timeline-driven SOPs	Christa von Hillebrandt-Andrade, CTWP
2.2	10:30	11:15	Key Stakeholders: Tsunami Warning Center SOPs - What do Tsunami Warning Centers (TWCs) provide to Tsunami Emergency Response (TER) agencies? Challenges in Detection and Tsunami Threat	Dr. Stuart Weinstein, PTWC
2.3	11:15	12:00	Key Stakeholders: Tsunami Emergency Response SOPs: What do TER agencies provide to the Public? Challenges in Alerting, Evacuation, and Safe-to-Return (All-Clear)	Brome
	12:00	13:00	LUNCH	
			AFTERNOON - PTWC Enhanced Products, Country SOPs	
3.1	13:00	13:30	Pacific Tsunami Warning Center (PTWC) Enhanced Products Overview - What, Why, SOPs (Criteria, Formats)	Weinstein
3.2	13:30	14:00	PTWC Enhanced Products - Staging	Weinstein

3.3	14:00	15:00	PTWC Enhanced Products - Explanation of Product: Public Products: Text Private Products: Graphical Deep-Ocean Energy, Forecast Polygon Map, Coastal Forecast, Forecast Tables, KMZ file	von Hillebrandt-Andrade, Weinstein
	15:00	15:15	COFFEE / TEA BREAK	
	15:15	16:00	PTWC Enhanced Products - Explanation of Each Product (Cont'd)	Weinstein
3.4	16:00	17:00	ICG/CARIBE-EWS Country SOPs - Readiness, Gaps, Actions 2017 Hurricane Season – Lessons to be Learned	von Hillebrandt-Andrade
			Wednesday 01 November 2017	
			MORNING – TWC Operations - Earthquakes, Tsunamis; Tsunami Warning Decision Support Tools	
4.1	08:30	09:00	TWC Operations: Seismic Monitoring in the Caribbean	von Hillebrandt-Andrade
4.2	09:00	09:45	TWC Operations: Real-time Earthquake Detection and Fast Source Characterization - Sparse networks, Magnitudes, W-Phase Centroid Moment Tensors – Techniques, Limitations, Challenges	Weinstein
4.3	09:45	10:30	Demonstration: Decision Support Tools of Monitoring, Detection, Assessment – Earthquakes: Real-time Earthquake Display (CISN), USGS web site (CMT, ShakeMap, PAGER)	von Hillebrandt-Andrade
	10:30	10:45	COFFEE / TEA BREAK	
4.4	10:45	11:00	TWC Operations: Sea Level Monitoring in the Caribbean, Instruments, Limitations, Challenges	von Hillebrandt-Andrade
4.5	11:00	12:00	Demonstration: Decision Support Tools of Monitoring, Detection, Assessment – Tsunamis: TideTool with Tsunami Travel Times, IOC Sea Level Monitoring Facility web site	Weinstein
	12:00	13:00	LUNCH	
			AFTERNOON - TWC Operations - Tsunami Forecasting, Country SOP Guidance for PTWC Enhanced Products	
4.6	13:00	13:45	TWC Operations: Travel Time and Wave Amplitude Forecasting – Techniques, Limitations, Uncertainty, Sensitivity Studies	Weinstein
5.1	13:45	14:30	TWC and TER Guidance on how to use PTWC New Enhanced Products for National Warnings and Evacuation – Land and Marine Threats and Public Safety: Flow Charts, Criteria Tables, Timeline-driven SOPs, Message Templates	von Hillebrandt-Andrade
5.2	14:30	15:30	Activity: Developing Country SOPs for the PTWC Enhanced Products - Warning Communications Flow Chart, Criteria Tables	Brome

	15:30	15:45	WORKING COFFEE / TEA BREAK	
5.3	15:45	17:00	Activity: Improving Response – What Happens When? Timeline-drive SOPs for Local Scenario	Brome
			Thursday 02 November 2017	
			MORNING - Tsunami Hazard Scenarios, Tsunami Exercise	
6.1	08:30	09:00	Day 1 & 2 Follow-Up	Brome
6.2	09:00	09:45	Tsunami Hazard Scenarios for the Caribbean – Understanding PTWC Enhanced Products	Weinstein
	9:45	10:00	COFFEE / TEA BREAK	
6.3	10:00	12:00	Tsunami Table Top Exercise - Decision-making using PTWC Enhanced Products, Regional Scenario	von Hillebrandt-Andrade
6.4	12:00	12:30	Tsunami Table Top Exercise –Debrief and Hotwash	von Hillebrandt-Andrade, Brome
	12:30	13:45	LUNCH	
			AFTERNOON - CARIBEWAVE 18, Conclusion, Closing Ceremony	
6.5	13:45	14:30	Tsunami Exercises, CARIBEWAVE18	von Hillebrandt-Andrade, Brome
6.6	14:30	15:00	Summary Discussion: Country Readiness for PTWC Enhanced Products	All
	15:00	15:15	COFFEE / TEA BREAK	
7	15:15	15:45	Closing Ceremonies	CTIC, IOCARIBE, CTWP, PTWC