



**UNESCO – IOC / NOAA INTERNATIONAL TSUNAMI INFORMATION CENTER (ITIC)
ITIC TRAINING PROGRAMME INTERNATIONAL (ITP-INTL)
SOUTHEASTERN CARIBBEAN**

**Regional Training Workshop on Strengthening Tsunami Warning and Emergency Response
Standard Operating Procedures and the Development of the ICG/CARIBE-EWS Pacific
Tsunami Warning Center (PTWC) New Enhanced Products**

**18-22 November 2013
Radisson Aquatica Resort Barbados
Bridgetown, Barbados**

Hosted by the Caribbean Tsunami Information Center (CTIC)

**Supported by UNESCO and the UNDP regional office for OECS and Barbados, through
Enhancing Resilience to Reduce Vulnerability in the Caribbean (ERC) Project**

Trainers:

Nicolas Arcos, Technical Information Specialist – Tsunamis, ITIC, USA
Tony Elliott, Head, ICG/IOTWS Secretariat, IOC Tsunami Unit, Australia
Kerry Hinds, Director (Ag.), Dept of Emergency Management, Barbados
Dr. Laura Kong, Director, ITIC, USA
Masahiro Yamamoto, Senior Tsunami Advisor (Retired), IOC Tsunami Unit, Japan

Organizers:

Alison Brome, Interim Director, CTIC
Marlon Clarke, Project Officer, UN Development Programme Barbados and OECS
Laura Kong, Director, ITIC

This 1-week training workshop will cover essential topics involved in end-to-end tsunami warning. In event time, the topics include event monitoring and detection, threat evaluation and warning, alert dissemination, emergency response, evacuation, and public action. An effective tsunami warning system is achieved when all people in vulnerable coastal communities are prepared to respond appropriately and in a timely manner upon recognizing that a potential destructive tsunami may be approaching. Meeting this challenge requires round the-clock monitoring with real-time data streams and rapid alerting, as well as prepared communities, a strong emergency management system, and close and effective cooperation between all stakeholders. Stakeholders must be able to work in coordination and with good understanding of each other's roles, responsibilities, authorities, procedures, and action during a tsunami event. Planning and preparedness, and practicing in advance of the real event, are important to familiarize agency staff with the steps and decision-making that will need to be carried out without hesitation in a real emergency. In this context, the Training emphasizes the development of sound tsunami warning and emergency response standard operating procedures (SOPs) as a key requirement for successful end-to-end warning. The Training includes an information and feedback session on the proposed PTWC Enhanced Tsunami Products. These products were approved for development by the ICG/CARIBE-EWS VIII (2013) and introduced in CARIBE WAVE 2013.

FINAL AGENDA

Sess ion	Start Time	End Time	T W C	T E R	Topic	Speaker
1-3					DAY 1: SESSIONS 1, 2, 3	
					MORNING: PLENARY	
1-2					Opening, Tsunami Warning and Emergency Response – Overview	
	8:00	8:30			Registration	CTIC, UNDP
1.1	8:30	9:15			Opening Ceremonies	Barbados, CTIC, USA, UNDP
	9:15	9:30			COFFEE / TEA BREAK	
1.2	9:30	9:40			Logistics and Administrative Items	CTIC – Brome UNDP - Clarke
1.3	9:40	9:50			Regional Partner Support to the ICG/CARIBE-EWS Tsunami Early Warning System - Caribbean Institute for Meteorology and Hydrology (CIMH)	CIMH
2.1	9:50	10:05			Course Overview	ITIC - Arcos
2.2	10:05	10:50			End-to-End Tsunami Warning and Emergency Response – Overview	ITIC - Kong
2					Stakeholders, Lessons Learned	
2.3	10:50	11:20			End-to-end Tsunami Warning – Stakeholders, Roles and Responsibilities, Standard Operating Procedures, and their linkages	Barbados - Hinds
2.4	11:20	12:00			Lessons Learned from Past Tsunamis - Warning and Emergency Response	IOC - Yamamoto
	12:00	13:30			LUNCH	
					AFTERNOON: PLENARY	
2-3					Lessons Learned, Country Presentations	
2.4	13:30	14:00			Lessons Learned from Past Tsunamis - Warning and Emergency Response	IOC - Yamamoto
3.1	14:00	15:30			Country Presentations (Aruba, Cayman Islands, Curacao, Dominica, Grenada, France - Martinique, France - Guadeloupe, St. Lucia) - 10 min/country	Arcos, Countries
	15:30	15:45			COFFEE / TEA BREAK	
3.1	15:45	16:30			Country Presentations (St. Vincent, Trinidad & Tobago, Venezuela) - 10 min/country	Arcos, Countries
3.2	16:30	17:00			Discussion: Challenges for achieving end-to-end TWS: Data, Resources, Communication, Stakeholders, Coordination, Evacuation	Hinds, Arcos, Countries
4					DAY 2: SESSION 4	
					MORNING: PLENARY	
4					Science, Tsunami Warning, ICG/CARIBE-EWS, Tools	
4.1	8:30	9:00			Earthquake Seismology for Tsunami Warning - nomenclature, faulting, magnitude	Yamamoto
4.2	9:00	9:30			Tsunami Science for Tsunami Warning - generation, propagation, impact	Kong
4.3	9:30	10:00			Caribbean Tsunami Hazards - historical and paleotsunami records	Arcos
4.4	10:00	10:15			IOC Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions, ICG/CARIBE-EWS	Hinds
	10:15	10:45			COFFEE / TEA BREAK - Group Photo	UNDP, CTIC
4.4	10:45	11:30			Tsunami Warning Centre Standard Operating Procedures – Concept of Operations, Overview on Routine and Event Operations, Flow Charts, Timelines, Checklists	Elliott

4.6	11:30	12:00		ICG/CARIBE-EWS International Tsunami Warning Centers - PTWC Standard Operating Procedures (SOP) for Monitoring and Detection of Earthquakes and Tsunamis, Evaluation of Tsunami Threat, Forecasting, Types of Products, and Message Dissemination	Kong
4.7	12:00	12:30		Tsunami Warning Decision Support Tools: Earthquake and Sea Level Monitoring, PTWC SMS Alerts, Historical Databases, Tsunami Travel Time Calculation. (Installation and Training as needed during unscheduled times)	Arcos, Kong, Elliott
	12:30	14:00		LUNCH	
				AFTERNOON: PLENARY	
4				Emergency Response, Warning Dissemination	
4.8	14:00	14:30		Tsunami Emergency Response Standard Operating Procedures - Overview on Stakeholder Roles and Coordination, Event Operations, Timelines, Checklists	Elliott
4.9	14:30	15:00		Case Study: Warning Dissemination and Public Alerting – Authoritative agencies, media, and the public – US Emergency Alert System, Hawaii example	Arcos
4.10	15:00	15:30		Case Study: Warning Dissemination and Public Alerting – Authoritative agencies, media, and the public – JMA-NHK Warning Dissemination	Yamamoto
	15:30	15:45		COFFEE / TEA BREAK	
4.11	15:45	16:30		Emergency communications - Robustness, reliability, redundancy. Technologies for the downstream transmission of warnings to communities	Kong
4.12	16:30	17:00		Learning Activity (individual followed by group discussion) – Official and Unofficial Information	Hinds, Elliott
4-5				DAY 3: SESSION 4	
				MORNING: PLENARY	
4				Exercises, Preparedness, Evacuation	
4.13	8:30	9:00		Tsunami Exercises: Types, Guidance, International Examples	Elliott
4.14	9:00	9:30		Tsunami preparedness: International Perspectives and Examples	Arcos
4.15	9:30	10:15		Tsunami preparedness in the Caribbean: Exercise CARIBEWAVE 2013, US TsunamiReady, Caribbean TsunamiSmart, and other examples	Hinds
	10:15	10:45		COFFEE / TEA BREAK	
4.16	10:45	11:30		Public Coastal Evacuations: Inundation Modeling, Evacuation Maps, Routes and Signage, Safe Return	Arcos
4.17	11:30	12:00		Vertical Evacuation and Refuge: Progress in Designing Tsunami-Resistant Structures	Kong
4.18	12:00	12:30		Learning Activities (individual followed by group discussion) – Tsunami Warning and Emergency Response Timeline - What happens when?, Frequently-asked Questions	Elliott, Hinds
	12:30	14:00		LUNCH	
				AFTERNOON: PLENARY	
				TWC and TER - Challenges and Limitations	
4.19	14:00	14:45		TWC Operations Challenges and Limitations: Real-time earthquake source characterization and Tsunami Assessment	Yamamoto, Kong
4.20	14:45	15:30		TER Operations Challenges and Limitations: Rapid Alerting and Evacuation	Elliott, Hinds
	15:30	15:45		COFFEE / TEA BREAK	
5				PTWC Proposed New Enhanced Products	
5.1	15:45	16:30		PTWC Proposed ICG/CARIBE-EWS Enhanced Products: Overview - Why, What, When and How to Use, Limitations	Kong
5.2	16:30	17:00		PTWC Proposed ICG/CARIBE-EWS Enhanced Products: Discussion and Feedback	Kong

				DAY 4: TWC and TER (DMO) MEET SEPARATELY FOR SPECIFIC TOPICAL AND TECHNICAL DISCUSSIONS	
TWC -6, 7				DAY 4: SESSIONS 6 - TWC, 7	
				MORNING: TWC SESSION	
				TWC Special Topics, SOP Development	
TWC -6.1	8:30	9:30		Real-time Earthquake Source Characterization - Advanced Topics, such as W-phase Centroid Moment Tensors, Finite Fault Rupture, Slow Earthquakes, Great and Gigantic Earthquakes	Yamamoto
TWC -6.2	9:30	10:15		Tsunami Assessment - Advanced Topics, such as Travel Time and Wave Forecasting including Techniques, Use and Limitations	Kong
	10:15	10:45		COFFEE / TEA BREAK	
TWC -6.3	10:45	11:15		Creating Timeline-driven SOPs - How to Guidance, Explanation of Warning Center Templates for Distant and Local Threats, Flow Charts and Checklists.	Elliott
TWC -6.4	11:15	12:30		SOP Breakout Groups: Using Templates to Develop Timeline of Processes and Actions (Criteria for Action, Messages, Checklists, Information Dissemination, Media Information)	Yamamoto, Elliott, Small Groups
	12:30	14:00		LUNCH	
				AFTERNOON: SOP Development, PLENARY	
	14:00	15:30		Breakout Groups (cont'd)	Yamamoto, Elliott, Small Groups
	15:30	15:45		COFFEE / TEA BREAK	
TWC -6.5	15:45	16:15		Breakout Groups - Final Discussion	Yamamoto, Elliott, Small Groups
7.1	16:15	16:45		Table Top Exercise – Background and Scenarios for Day 5	Kong
TER- 6, 7				DAY 4: SESSIONS 6 - TER, 7	
				MORNING: TER SESSION	
				TER Special Topics, SOP Development	
TER- 6.1	8:30	9:15		Community-level preparedness and education – Schools, Businesses, Special Needs Populations, Tourism Sector, Ports and Harbors	Hinds
TER- 6.2	9:15	10:15		Small Group Exercise - Evacuation Mapping	Arcos, Hinds
	10:15	10:45		COFFEE / TEA BREAK	
TER- 6.3	10:45	11:15		Tsunami Emergency Response – Local Tsunami Threat – Wakayama, Japan Case Study	Yamamoto
TER- 6.4	11:15	12:00		Creating Timeline-driven SOPs - How to Guidance, Explanation of Response Templates for Distant and Local Threats, Flow Charts and Checklists	Arcos
TER- 6.5	12:00	12:30		SOP Breakout Groups: Using Templates to Develop General Roles and Responsibilities and Timeline of Processes and Actions (Criteria for Action, Evacuation Checklists, Information Dissemination, Media Information)	Hinds, Arcos, Small Groups
	12:30	14:00		LUNCH	
				AFTERNOON: SOP Development, PLENARY	
	14:00	15:30		Breakout Groups (cont'd)	Hinds, Arcos, Small Groups
	15:30	15:45		COFFEE / TEA BREAK	
TER- 6.6	15:45	16:15		Breakout Groups - Final Discussion	Hinds, Arcos, Small Groups
7.1	16:15	16:45		Table Top Exercise – Background and Scenarios for Day 5	Kong

7-8					DAY 5: SESSIONS 7, 8	
					MORNING: PLENARY	
					Tsunami Exercise	
7.2	8:00	8:30			Exercise Set-up according to Stakeholder Warning and Response Groups	Exercise Controllers - Kong, Yamamoto
	8:30	8:45			COFFEE / TEA BREAK	
7.3	8:45	11:15			CARIBE-EWS Tsunami Exercise - PTWC messages	Exercise Controllers, Small Groups
7.4	11:15	11:45			Post-Exercise Evaluation - Report Preparation	Small Groups
7.5	11:45	12:30			Post-Exercise Evaluation Hotwash – Comments, Problems, Improvements	Elliott
	12:30	13:30			LUNCH	
					AFTERNOON: PLENARY	
					Post-Exercise Evaluation, Next Steps	
7.7	13:30	14:00			Toward Building National and Regional Capabilities - Summary Discussion and Next Steps	Hinds, Kong, Elliott, Countries
					Closing	
8	14:00	14:30			Presentation of Certificates, Closing Ceremony	IOC, ITIC, All