



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

4-8 November 2013

La Romana Dreams Hotel, La Romana, Dominican Republic

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:

Bernardo Aliaga, Technical Secretary, ICG/PTWS and ICG/CARIBE-EWS, IOC Tsunami Unit
Tammy Fukuji, Information Technology Specialist, ITIC
Dr. Laura Kong, Director, ITIC
Dr. Charles McCreery, Director, PTWC
Christa von Hillebrandt, Manager, Caribbean Tsunami Warning Programme

CTIC, UNDP

Alison Brome, Interim Director, CTIC
Marlon Clarke, Project Officer, UN Development Programme (UNDP) Barbados and OECS

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

Session	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	
	7:15	8:00			Registration	CTIC, UNDP
1.1	8:00	8:30			Opening Ceremonies	IOC, UNDP, ICG/CARIBE-EWS, USA
1.2	8:30	8:40			Logistics and other administrative items	CTIC - Brome
2.1	8:40	8:50			Course Overview	PTWC - McCreery
2.2	8:50	9:35			End-to-End Tsunami Warning and Emergency Response – Overview	ITIC - Kong
2.3	9:35	9:45			Regional Partner Support to the ICG/CARIBE-EWS Tsunami Early Warning System - Caribbean Disaster Emergency Management Agency (CDEMA)	CDEMA - Donna Pierre, Mitigation and Preparedness Specialist
	9:45	10:15			COFFEE / TEA BREAK - Group Photo	CTIC, UNDP
2					Tsunami Warning and Emergency Response – Overview	
2.4	10:15	10:45			End-to-end Tsunami Warning – Stakeholders, Roles and Responsibilities, Standard Operating Procedures, and their linkages	IOC - Aliaga
2.5	10:45	12:00			Lessons Learned from Past Tsunamis - Warning and Emergency Response	PTWC - McCreery, Kong
	12:00	13:30			LUNCH	
					AFTERNOON: PLENARY	
3					Country Presentations - Tsunami Standard Operating Procedures	
3.1	13:30	15:00			Country Presentations (Antigua & Barbuda, Bahamas, Dominican Republic, Haiti, Mexico, St Kitts & Nevis, UK Anguilla) - 10 min/country	ITIC - Fukuji, Countries
	15:00	15:15			COFFEE / TEA BREAK	
3.1	15:15	16:00			Country Presentations (UK British Virgin Islands, UK Turks & Caicos, USA Puerto Rico, USA Virgin Islands) - 10 min/country	Fukuji, Countries
3.2	16:00	16:30			Discussion: Challenges for achieving end-to-end TWS: Data, Resources, Communication, Stakeholders, Coordination, Evacuation	Aliaga, Countries
4					DAY 2: SESSION 4	
					MORNING: PLENARY	
4					Science, Tsunami Warning, Tools	
4.1	8:00	8:30			Earthquake Seismology for Tsunami Warning - nomenclature, faulting, magnitude	Kong
4.2	8:30	9:00			Tsunami Science for Tsunami Warning - generation, propagation, impact	McCreery
4.3	9:00	9:45			Tsunami Warning Centre Standard Operating Procedures – Concept of Operations, Overview on Routine and Event Operations, Flow Charts, Timelines, Checklists	Kong
	9:45	10:15			COFFEE / TEA BREAK	
4.4	10:15	10:30			IOC Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions	Aliaga
4.5	10:30	11:00			Caribbean Tsunami Hazards - historical and paleotsunami records	CTWP - von Hillebrandt

4.6	11:00	11:30		ICG/CARIBE-EWS International Tsunami Warning Centers - PTWC and US NTWC (WC/ATWC) Standard Operating Procedures (SOP) for Monitoring and Detection of Earthquakes and Tsunamis, Evaluation of Tsunami Threat, Forecasting, Types of Products, and Message Dissemination	McCreery
4.7	11:30	12:00		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)	Fukuji, Kong
	12:00	13:30		LUNCH	
				AFTERNOON: PLENARY	
4				Emergency Response, Warning Dissemination	
4.8	13:30	14:00		Tsunami Emergency Response Standard Operating Procedures - Overview on Stakeholder Roles and Coordination, Event Operations, Timelines, Checklists	Kong
4.9	14:00	14:30		Case Study: Warning Dissemination and Public Alerting – Authoritative agencies, media, and the public – US Emergency Alert System, Hawaii example	von Hillebrandt
4.10	14:30	15:00		Case Study: Warning Dissemination and Public Alerting – Authoritative agencies, media, and the public – JMA-NHK Warning Dissemination	Aliaga
	15:00	15:15		COFFEE / TEA BREAK	
4.11	15:15	16:00		Emergency communication considerations and technologies for the downstream transmission of warnings to local governments and communities – TV / FM / HF / Radio, Sirens, Mobile Phones / SMS, Internet email/web, Social Media, etc – robustness, reliability, redundancy	Kong
4.12	16:00	16:30		Learning Activity (individual followed by group discussion) – Official and Unofficial Information	von Hillebrandt, Fukuji
4-5				DAY 3: SESSION 4	
				MORNING: PLENARY	
4				Exercises, Preparedness, Evacuation	
4.13	8:00	8:45		Use of Exercises in Tsunami Preparedness: International / National / Local Exercises, Types, and Post-Exercise Evaluations, IOC Tsunami Wave Guidance, Exercise CARIBE WAVE 2013	von Hillebrandt
4.14	8:45	9:30		Tsunami preparedness and response - International Perspectives, including NZ Get Ready Get Thru, US TsunamiReady programs, Caribbean TsunamiSmart	von Hillebrandt
	9:30	10:00		COFFEE / TEA BREAK	
4.15	10:00	10:40		Public Coastal Evacuations: Alerting and Moving People, Inundation Modeling and Maps, Evacuation Routes and Signage, Safe return Evacuation Planning: Role and Value of Tsunami Inundation Modeling	Aliaga
4.16	10:40	11:20		Vertical Evacuation and Refuge: Progress in Designing Tsunami-Resistant Structures	Kong
4.17	11:20	12:00		Learning Activities (individual followed by group discussion) – Tsunami Warning and Emergency Response Timeline - What happens when?, Frequently-asked Questions	von Hillebrandt, Fukuji
	12:00	13:30		LUNCH	
				AFTERNOON: PLENARY	
				TWC and TER - Challenges and Limitations	
4.18	13:30	14:15		TWC Operations: Real-time earthquake source characterization and tsunami assessment - Challenges and Limitations	McCreery
4.19	14:15	15:00		TER Operations: Rapid Alerting and Evacuation - Challenges and Limitations	Kong
	15:00	15:15		COFFEE / TEA BREAK	
5				PTWC Tsunami Warning Operations - PTWC New Products	
5.1	15:15	16:00		PTWC Proposed ICG/CARIBE-EWS Enhanced Products: Overview - Why, What, When and How to Use, Limitations	McCreery
5.2	16:00	16:30		PTWC Proposed ICG/CARIBE-EWS Enhanced Products: Discussion and Feedback	McCreery

					DAY 4: TWC and TER (DMO) MEET SEPARATELY FOR SPECIFIC TOPICAL AND TECHNICAL DISCUSSIONS	
6-TWC, 7					DAY 4: SESSIONS 6 - TWC, 7	
					MORNING: TWC SESSION	
					TWC Special Topics, SOP Development	
6.1	8:00	9:00			Earthquake Seismology - W-phase Centroid Moment Tensors, Finite Fault Rupture, Slow Earthquakes, Great and Gigantic Earthquakes	Kong or McCreery
6.2	9:00	9:45			Tsunami forecasting (Travel Time and Wave Height) - Techniques, Use and Limitations, Future Directions	McCreery
	9:45	10:15			COFFEE / TEA BREAK	
6.3	10:15	10:45			Creating Timeline-driven SOPs - How to Guidance, Explanation of Warning Center Templates for Distant and Local Threats, Flow Charts and Checklists.	von Hillebrandt
6.4	10:45	12:00			SOP Breakout Groups: Using Templates to Develop Timeline of Processes and Actions (Criteria for Action, Messages, Checklists, Information Dissemination, Media Information)	von Hillebrandt, McCreery, Small Groups
	12:00	13:30			LUNCH	
					AFTERNOON: TWC SESSION, PLENARY	
	13:30	15:00			Breakout Groups (cont'd)	von Hillebrandt, McCreery, Small Groups
	15:00	15:15			COFFEE / TEA BREAK	
6.5	15:15	16:00			Breakout Groups Report Out and Discussion - SOPs	von Hillebrandt, McCreery, Small Groups
7.1	16:00	16:30			Table Top Exercise – Background and Scenarios for Day 5	Kong
6-TER, 7					DAY 4: SESSIONS 6 - TER, 7	
					MORNING: TER SESSION	
					TER Special Topics, SOP Development	
6.1	8:00	9:00			Small Group Exercise - Evacuation Mapping	Aliaga
6.2	9:00	9:45			Community-level preparedness and education – Schools and businesses, Special Needs Populations, Tourism Sector	von Hillebrandt
	9:45	10:15			COFFEE / TEA BREAK	
6.3	10:15	10:45			Tsunami Emergency Response – Local Tsunami Threat – Wakayama, Japan Case Study	Kong
6.4	10:45	11:30			Creating Timeline-driven SOPs - How to Guidance, Explanation of Response Templates for Distant and Local Threats, Flow Charts and Checklists	Aliaga
6.5	11:30	12:00			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)	Aliaga, Fukuji, Small Groups
	12:00	13:30			LUNCH	
					AFTERNOON: TER SESSION, PLENARY	
	13:30	15:00			Breakout Groups (cont'd)	Aliaga, Fukuji, Small Groups
	15:00	15:15			COFFEE / TEA BREAK	
6.6	15:15	16:00			Breakout Groups Report Out and Discussion - SOPs	Aliaga, Fukuji, Small Groups
7.1	16:00	16:30			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	8:45			Exercise Set-up according to Stakeholder Warning and Response Groups	Exercise Controllers - Kong, McCreery
	8:45	9:00			COFFEE / TEA BREAK	
7.3	9:00	11:45			CARIBE-EWS Tsunami Exercise - PTWC and WC/ATWC messages	Exercise Controllers, Small Groups
7.4	11:45	12:00			Post-Exercise Evaluation - Report Preparation Instructions	
	12:00	13:30			LUNCH	
					AFTERNOON: PLENARY	
					Post-Exercise Evaluation, Next Steps	
7.5	13:30	14:00			Post-Exercise Evaluation - Report Preparation	Small Groups
7.6	14:00	15:00			Post-Exercise Evaluation Hotwash – Comments, Problems, Improvements	von Hillebrandt
	15:00	15:15			COFFEE / TEA BREAK	
7.7	15:15	15:45			Toward Building National and Regional Capabilities - Summary Discussion and Next Steps	Aliaga, von Hillebrandt
					Closing	
8	15:45	16:15			Presentation of Certificates, Closing Ceremony	IOC, ITIC, CTIC, All