



United Nations
Educational, Scientific and
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Intergovernmental
Oceanographic
Commission



National Oceanic
and Atmospheric
Administration



International
Tsunami Information
Center



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

ITP-Cook Islands: Tsunami Warning and Emergency Response Using the PTWC Enhanced Products for National Tsunami Threat Decision-Making Rarotonga, Cook Islands 16-19 November 2015

Trainers

Dr. Laura Kong, Director, ITIC, Hawaii, USA

Shohei Matsuura, JICA DRR Advisor, Disaster Reduction Programme (DRP), Fiji

Rajendra Prasad, Programme Officer, IOC Tsunami Unit, Fiji

Masahiro Yamamoto, Senior Advisor (retired), IOC Tsunami Unit, Japan

Training Overview

The 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 warning and emergency response plan and standard operating procedures (SOPs) of the Cook Islands. 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 26 December 2004 helping to increase scientific understanding, better techniques have been developed to quickly characterize the earthquake and numerically model the tsunami. In 2014, the PTWC implemented Enhanced Products for the PTWS that now include wave amplitude forecasts in both text and graphical formats, and that require each country to explicitly assign Warning / Watch status in their own messages to their coasts. In July 2015, the First Pacific Ministerial Meeting on Meteorology adopted the Nuku'alofa Declaration, calling for support to ensure that National Meteorological and Hydrological Services (NMHS) have the necessary capacity to support sustainable development, and specifically for the need to strengthen their tsunami early warning systems. Accordingly, the goal of this training is to increase the capacity of first responder operational staff to efficiently and effectively respond to tsunamis.

FINAL AGENDA

Sess ion	Start Time	End Time	Topic	Speaker
1-3			Monday, November 16, 2015	
			MORNING	
			Opening, ICG/PTWS-XXVI, Tsunami Early Warning Systems	
	8:30	9:00	Registration	Cook Islands (CI)
1.1	9:00	9:30	Opening Ceremonies	ITIC, IOC, JICA, Cook Islands
	9:30	9:50	GROUP PHOTO	
1.2	9:50	10:10	Logistics and Administrative Items, Introductions Course Overview	Shohei Matsuura, JICA
2.1	10:10	10:30	ICG/PTWS-XXVI Outcomes, specifically for the Pacific Islands	Rajendra Prasad, IOC
	10:30	11:00	COFFEE / TEA BREAK	
2.2	11:00	11:45	Responding Rapidly and Effectively: Tsunami Warning and Emergency Response Requirements and Timeline-driven SOPs	Laura Kong, ITIC
2.3	11:45	12:30	Tsunami Warning Center SOPs: What do Tsunami Warning Centers (TWCs) provide to Tsunami Emergency Response (TER) agencies?	Masahiro Yamamoto
	12:30	13:30	LUNCH	
			AFTERNOON	
			PTWC Enhanced Products, Cook Islands SOPs	
2.4	13:30	13:45	PTWS video: Tsunami Warning!	Kong
3.1	13:45	14:45	Pacific Tsunami Warning Center (PTWC) New Enhanced Products - Overview - What, Why, Criteria, Formats	Kong
	14:45	15:00	COFFEE / TEA BREAK	
3.2	15:00	15:30	Pacific Tsunami Warning Center (PTWC) New Enhanced Products - Staging	Kong
3.3	15:30	16:15	Cook Islands TWC and TER SOPs using PTWC Enhanced Products	CI Meteorological Service and NDMO
3.4	16:15	16:30	Discussion: CI SOPs – status, gaps, needs	Prasad, All
4-5			Tuesday, November 17, 2015	
			MORNING	
			Earthquake and Tsunami Science and Hazard, PTWC Enhanced Products	
4.1	9:00	9:45	Earthquake Science and Hazards Tsunami Science and Hazards	Yamamoto
4.2	9:45	10:30	PTWC Enhanced Products - Explanation of Each Product: Text, Forecast Polygon Map, Graphical Deep-Ocean Energy, Coastal Forecast, Forecast Tables, KMZ file	Kong
	10:30	11:00	COFFEE / TEA BREAK	
4.3	11:00	11:45	16 September 2015, M8.3 Tsunami – PTWC summary, PTWS Post-Tsunami Event Assessment Survey	Kong Prasad, Ngari
4.3	11:45	12:30	Tsunami Hazard Scenarios around the Pacific - Understanding PTWC Enhanced Products	Kong
	12:30	13:30	LUNCH	
			AFTERNOON	
			NTWC and TER SOPs for PTWC Enhanced Products, Tsunami Messages; Tsunami Warning Decision Support Tools	
4.4	13:30	14:00	Tsunami Emergency Response (TER) SOPs: Overview of Stakeholder Roles and Coordination, Event Operations, Timelines, Checklists, Examples	Matsuura
4.5	14:00	14:45	TWC and TER SOPs for PTWC Enhanced Products: Guidance, Flow Charts, Criteria Tables, Timeline-driven SOP, Message Templates. Warning (EQ Magnitude and Forecast thresholds), Evacuation (Land and Marine Threats and Public Safety)	Kong, Prasad

	14:45	15:00	COFFEE / TEA BREAK	
5.1	15:00	15:45	Cook Islands SOP Development: Communications Flow Chart, Roles & Responsibilities	Prasad, Matsuura, CI
5.2	15:45	16:45	Demonstration: Decision Support Tools of Monitoring, Detection, Assessment – Earthquakes: Real-time Earthquake Display (CISN), USGS web site (CMT, ShakeMap, PAGER) Tsunami: Sea Level Monitoring (IOC web site, TideTool with Tsunami Travel Times), RIFT Tsunami Scenarios	Kong
5			Wednesday, November 18, 2015	
			MORNING	
			Alert Criteria Tables, Timeline-driven SOPs	
5.3	9:00	10:00	Cook Islands SOP Development: Alert Criteria Table – Regional and Distant Tsunami Cases	Kong, CI
5.4	10:00	10:30	Cook Islands SOP Development: Timeline-driven actions – Regional Tsunami Case - when, who, how to decide, what to use Decision-making processes for: 1. Warning/Watch/Information using: - PTWC initial message (no quantitative forecast, OT+7 min) - PTWC quantitative forecast (OT+25 min) 2. Cancelling Watch / Warning 3. Issuing "All-Clear"	Kong, Prasad, CI
	10:30	11:00	COFFEE / TEA BREAK	
	11:00	12:30	Cook Islands SOP Development: Timeline-driven actions – Regional Tsunami Case - when, who, how to decide, what to use (contd)	
	12:30	13:30	LUNCH	
			AFTERNOON	
			Timeline-driven SOPs, Tsunami Messages	
5.5	13:30	14:45	Cook Islands SOP Development: Timeline-driven actions – Distant Tsunami Case - when, who, how to decide, what to use	Prasad, Matsuura, CI
	14:45	15:00	COFFEE / TEA BREAK	
5.6	15:00	16:30	Cook Islands SOP Development: National Tsunami Message Products for Different Alert Levels: - Threat: Warning, Watch - No Threat: Information Statement	Kong, CI
6-7			Thursday, November 19, 2015	
			MORNING	
			TWC Operations – Earthquake Source Characterization, Tsunami Forecasting, TER Operations	
6.1	9:00	9:30	TWC Operations: Earthquake Monitoring: Real-time Detection and Fast Source Characterization – Methods to determine Magnitude and Fault Mechanism (W-Phase CMT), Limitations and Challenges (did not present in detail)	Kong
6.2	9:30	10:00	TWC Operations: Sea Level Monitoring - Methods, Instruments, Limitations, Challenges	Yamamoto
6.3	10:00	10:30	TWC Operations: Travel Time Forecasting - Methods, Limitations, Uncertainty, Sensitivity Studies (Location, Depth, Magnitude) (did not present in detail)	Yamamoto
	10:30	11:00	COFFEE / TEA BREAK	
6.4	11:00	11:45	TWC Operations: Wave Amplitude Forecasting – Methods, Limitations, Uncertainty, Sensitivity Studies (Location, Depth, Magnitude) (did not present in detail)	Kong
6.5	11:45	12:30	What do TERs do with TWC information? Challenges in Alerting, Evacuation, and Safe-to-Return (All-Clear) (did not present)	Prasad
	12:30	13:30	LUNCH	
			AFTERNOON	
			Awareness and Preparedness, What happens when? Closing	

6.6	13:30	14:00	Building Awareness & Community Preparedness – Being TsunamiSmart and TsunamiReady (did not present)	Kong
6.7	14:00	14:45	Activity: Improving Response – What Happens When? Reliable and Unreliable Information (did not present)	Matsuura
6.8	14:45	15:30	Final Discussion: CI Readiness - Questions, Answers, Next Steps	Prasad, CI
	15:30	15:45	COFFEE / TEA BREAK	
7	15:45	16:15	Closing Ceremonies	CI, IOC, ITIC

			Friday, November 20, 2015	
	9:00	14:00	CIMS Decision Support Tools Training Visit Debrief and Next Steps, CI Tsunami Implementation Plan	ITIC, CIMS IOC, ITIC, JICA