



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

### **ITP-Fiji: Tsunami Warning and Emergency Response Using the PTWC Enhanced Products for National Tsunami Threat Decision-Making**

**Fiji Meteorological Service, Laucala Bay, Suva, Fiji  
10-14 July 2017**

#### **Trainers**

Dr. Laura Kong, Director, ITIC, National Oceanic and Atmospheric Administration (NOAA), Hawaii, USA  
Rajendra Prasad, Programme Officer, IOC Tsunami Unit, Fiji  
Masahiro Yamamoto, Senior Advisor (retired), IOC Tsunami Unit, Japan  
Lisa Kingsberry, Disaster Risk Communications Advisor, SPC, Fiji

#### **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 Fiji. 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. Accordingly, the goal of this training is to increase the capacity of first responder operational staff to efficiently and effectively respond to tsunamis.

Day 1 will provide a general overview of the Pacific's tsunami early warning system for all interested stakeholders and customers. Days 2-5 will provide advanced information for warning center and disaster management operational staff, and also include updates and training on tsunami warning decision support tools, such Tide Tool, TTT (Tsunami Travel Time), and TsuCAT (Tsunami Coastal Assessment Tool). Day 5 will review and update Fiji's Tsunami Implementation Plan based on information received during the training.

## PROVISIONAL AGENDA

Sess ion	Start Time	End Time	Topic	Speaker
1-3			<b>Monday, July 10, 2017</b>	
			<b>MORNING</b>	
			<b>Opening, ICG/PTWS-XXVII, Tsunami Early Warning Systems</b>	
	8:30	9:00	Registration	Fiji, IOC
1.1	9:00	10:00	Opening Ceremony	ITIC, IOC, JICA, Fiji
	10:00	10:30	COFFEE / TEA BREAK	
1.2	10:30	11:00	Logistics and Administrative Items, Introductions Course Overview	Fiji Mineral Resources Dept (MRD), ITIC, IOC
2.1	11:00	11:20	ICG/PTWS-XXVII Outcomes, specifically for the Pacific Islands	Rajendra Prasad, IOC
2.2	11:20	11:45	Tsunami Risk for Fiji	Fiji MRD
2.3	11:45	12:30	Responding Rapidly and Effectively: Tsunami Warning and Emergency Response Requirements and Timeline-driven SOPs	Laura Kong, ITIC
2.4	12:30	13:15	Tsunami Warning Center SOPs: What do Tsunami Warning Centers (TWCs) provide to Tsunami Emergency Response (TER) agencies?	Masahiro Yamamoto
	13:15	14:00	LUNCH	
			<b>AFTERNOON</b>	
			<b>PTWC Enhanced Products, Fiji SOPs</b>	
2.5	14:00	14:15	PTWS video: Tsunami Warning!	Kong
3.1	14:15	15:00	Pacific Tsunami Warning Center (PTWC) – Summary and Overview of Enhanced Products (What, Why, Criteria, Formats)	Kong
	15:00	15:15	COFFEE / TEA BREAK	
3.2	15:15	15:45	PTWC Enhanced Products - Staging	Kong
3.3	15:45	16:15	Fiji TWC and TER SOPs using PTWC Enhanced Products	Fiji MRD, Met Svc, Fiji NDMO
3.4	16:15	16:45	Discussion: Fiji SOPs – status, gaps, needs	Prasad, All
4-5			<b>Tuesday, July 11, 2017</b>	
			<b>MORNING</b>	
			<b>Earthquake and Tsunami Science and Hazard, PTWC Enhanced Products and Recent Event Experiences</b>	
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 sent to TWFPs: 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	11:30	Lessons Learned from Recent Tsunamis in the Pacific	Yamamoto, Kong Prasad, Fiji MRD
4.4	11:30	12:00	Exercise Pacific Wave (PacWave) 2017 Results	Prasad, Fiji NDMO
4.4	12:00	12:30	Tsunami Hazard Scenarios around the Pacific - Understanding PTWC Enhanced Products	Kong
	12:30	13:30	LUNCH	
			<b>AFTERNOON</b>	
			<b>NTWC and TER SOPs for PTWC Enhanced Products Tsunami Warning Decision Support Tools</b>	
4.5	13:30	14:00	Tsunami Emergency Response (TER) SOPs: Overview of Stakeholder Roles and Coordination, Event Operations, Timelines, Checklists, Examples	Kong, Fiji NDMO

4.6	14:00	15:00	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
	15:00	15:15	COFFEE / TEA BREAK	
5.1	15:15	15:45	Fiji SOP Development: Communications Flow Chart, Roles & Responsibilities	Prasad, Fiji MRD
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), Tsunami Coastal Assessment Tool (TsuCAT)	Kong
5			<b>Wednesday, July 12, 2017</b>	
			<b>MORNING</b>	
			<b>NTWC and TER SOPs for PTWC Enhanced Products</b>	
5.3	9:00	10:00	Fiji SOP Development: Alert Criteria Table – Local, Regional and Distant Tsunami Cases	Kong, Fiji MRD
5.4	10:00	10:30	Fiji SOP Development: Timeline-driven actions – Local, Regional and Distant Tsunami Cases - 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, Fiji MRD
	10:30	11:00	COFFEE / TEA BREAK	
	11:00	12:30	Fiji SOP Development: Timeline-driven actions – Local, Regional and Distant Tsunami Cases - when, who, how to decide, what to use (contd)	
	12:30	13:30	LUNCH	
			<b>AFTERNOON</b>	
			<b>Tsunami Warning and Media</b>	
5.5	13:30	15:15	Tsunami Warning Messages– Optimizing media and Public Response	Lisa Kingsberry SPC
	15:15	15:30	COFFEE / TEA BREAK	
5.6	15:30	16:45	Fiji SOP Development: National Tsunami Message Products for Different Alert Levels: - Threat: Warning, Watch, Advisory - No Threat: Information Statement	Kong, Fiji MRD, Fiji NDMO
6-7			<b>Thursday, July 13, 2017</b>	
			<b>MORNING</b>	
			<b>TWC Operations, TER Operations, Awareness and Preparedness</b>	
6.1	9:00	9:30	TWC Operations: Earthquake Monitoring: Real-time Detection and Fast Source Characterization, Magnitude and Fault Mechanism (W-Phase CMT), Limitations and Challenges	Kong, Yamamoto
6.2	9:30	10:00	TWC Operations: Sea Level Monitoring - Instruments, Limitations and Challenges	Yamamoto
6.3	10:00	10:30	TWC Operations: Travel Time and Wave Amplitude Forecasting - Methods, Limitations and Challenges	Kong
	10:30	11:00	COFFEE / TEA BREAK	
6.4	11:00	11:45	What do TERs do with TWC information? Challenges in Alerting, Evacuation, and Safe-to-Return (All-Clear)	Kong, Fiji MRD, Fiji NDMO
6.5	11:45	12:30	Building Awareness & Community Preparedness – Tsunami Evacuation Maps, Plans, and Procedures (TEMPP) training and Tsunami Ready pilots in the Pacific	Kong
	12:30	13:30	LUNCH	
			<b>AFTERNOON</b>	

			<b>Improving Response: Reliable Information, What happens when? Closing</b>	
<b>6.6</b>	13:30	14:00	Activity: Improving Response – Reliable and Unreliable Information	Prasad, Kingsberry
<b>6.7</b>	14:00	15:00	Activity: Improving Response – What Happens When?	Prasad, Kong, Yamamoto
<b>6.8</b>	15:00	15:30	Final Discussion: Fiji Readiness - Questions, Answers, Next Steps	Prasad, Fiji MRD & NDMO
	15:30	15:45	COFFEE / TEA BREAK	
<b>7</b>	15:45	16:15	Closing Ceremonies	Fiji, IOC, ITIC

			<b>Friday, July 14, 2017</b>	
			<b>TWC Operations, Tsunami Warning Decision Support Tools Fiji Implementation Plan</b>	
	9:00	10:00	TWC Operations: Travel Time and Wave Amplitude Forecasting - Methods, Limitations, Uncertainty, Sensitivity Studies (Location, Depth, Magnitude)	Kong, Yamamoto
	10:00	10:30	Decision Support Tools Training - Tide Tool, TTT, and Tsunami Coastal Assessment Tool (TsuCAT)	Kong
	10:30	11:00	COFFEE / TEA BREAK	
	11:00	13:00	Decision Support Tools Training (cont'd)	Kong
	13:00	14:00	LUNCH	
	14:00	15:00	Visit Debrief and Next Steps, Fiji Tsunami Implementation Plan	Fiji, IOC, ITIC, JICA