



United Nations
Educational, Scientific and
Cultural Organization



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-Peru: Tsunami Warning and Emergency Response
Using the PTWC Enhanced Products for National Tsunami Threat Decision-Making
Lima, Peru
30 November – 4 December 2015**

Trainers

Douglas Mayne, Administrator (former), Hawaii State Emergency Management Agency, USA
François Schindelé, Director, Centre de Alerta des Tsunamis, France
Dr. Stuart Weinstein, Deputy Director, Pacific Tsunami Warning Center (PTWC), Hawaii, USA

Training Overview

The training workshop will cover the 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 Peru. 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.

FINAL PROVISIONAL AGENDA (29 November 2015)

Sess ion	Start Time	End Time	Topic	Speaker
1-3			Day 1: Monday, November 30, 2015	
			MORNING	
			Opening, ICG/PTWS, Tsunami Warning	
	8:30	9:00	Registration	Peru
1.1	9:00	10:00	Opening Ceremonies	PTWC, France/IOC, Peru
	10:00	10:30	GROUP PHOTO, COFFEE / TEA BREAK	Peru DHN
1.2	10:30	10:45	Logistics and Administrative Items	Peru DHN
1.3	10:45	11:00	PTWS video: Tsunami Warning!	Stuart Weinstein, PTWC
1.4	11:00	11:15	Course Overview, Introductions	Douglas Mayne, USA
1.5	11:15	11:30	ICG/PTWS-XXVI Outcomes, especially for Peru	François Schindelé, France
2.1	11:30	12:30	Responding Rapidly and Effectively: Tsunami Warning and Emergency Response Requirements and Timeline-driven SOPs	Weinstein
	12:30	13:30	LUNCH	
			AFTERNOON	
			Tsunami Warning, Peru SOPs, Earthquake Science & Hazard	
2.2	13:30	14:15	Tsunami Warning Center SOPs: What do Tsunami Warning Centers (TWCs) provide to Tsunami Emergency Response (TER) agencies?	Schindelé
2.3	14:15	15:00	Peru Tsunami Warning and Emergency Response (TWER) SOPs using PTWC Enhanced Products	Peru
	15:00	15:15	COFFEE / TEA BREAK	
3.1	15:15	16:00	Pacific Regional Tectonics and Seismicity, and Earthquake Hazard	Schindelé
3.2	16:00	16:45	Science of Earthquakes for Tsunami Warning	Schindelé
3-5			Day 2: Tuesday, December 1, 2015	
			MORNING	
			Tsunami Science & Hazard, TER SOPs, Awareness & Preparedness	
3.3	9:00	9:45	Science of Tsunamis for Tsunami Warning	Weinstein
3.4	9:45	10:30	Tsunami Hazard, and Historical Tsunamis Affecting the Region, including Chimbote Peru 1996, Chile 2010, Chile 2014	Schindelé Peru DHN
	10:30	11:00	COFFEE / TEA BREAK	
4.1	11:00	11:30	TER SOPs: Overview of Stakeholder Roles and Coordination, Event Operations, Timelines, Checklists, Examples	Mayne
4.2	11:30	12:00	What do TERs do with TWC information? Challenges in Alerting, Evacuation, and Safe-to-Return (All-Clear)	Mayne
4.3	12:00	12:30	Building Awareness & Community Preparedness – strategies and examples	Mayne
	12:30	13:30	LUNCH	
			AFTERNOON	
			Awareness & Preparedness, PTWC Enhanced Products	
4.4	13:30	14:00	Building Awareness & Community Preparedness – Tsunami Evacuation Maps	Mayne
4.5	14:00	14:30	Building Awareness & Community Preparedness – Tsunami Exercises, PacWave	Mayne, Schindelé
4.6	14:30	15:00	Vertical Refuges: Tsunami-resistant Building Design, International Building Codes	Mayne
	15:00	15:15	COFFEE / TEA BREAK	

5.1	15:15	16:00	PTWC Operations overview - SOPs	Weinstein
5.2	16:00	16:45	Pacific Tsunami Warning Center (PTWC) New Enhanced Products - Overview - What, Why, Criteria, Formats	Weinstein
	16:45	17:45	Visit Peru NTWC	
5			Day 3: Wednesday, December 2, 2015	
			MORNING	
			PTWC Enhanced Products, 16 September 2015, Earthquake Analysis	
5.3	9:00	9:45	Pacific Tsunami Warning Center (PTWC) New Enhanced Products - Staging	Weinstein
5.4	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	Weinstein
	10:30	11:00	COFFEE / TEA BREAK	
5.5	11:00	11:45	16 September 2015, M8.3 Tsunami: PTWC summary, PTWS Post-Event Tsunami Assessment	Weinstein, Schindel�
5.6	11:45	12:30	TWC Operations: Real-time Earthquake Detection and Fast Source Characterization – Methods to determine Magnitude and Fault Mechanism (W-Phase CMT)	Weinstein
	12:30	13:30	LUNCH	
			AFTERNOON	
			Earthquake and Tsunami Analysis, Decision Support Tools	
5.7	13:30	14:15	TWC Operations: Real-time Earthquake Detection and Fast Source Characterization – Methods to determine Magnitude and Fault Mechanism (W-Phase CMT)	Weinstein
5.8	14:15	15:00	TWC Operations: Real-time Earthquake Detection and Fast Source Characterization, including magnitude and focal mechanism – Limitations and Challenges. Historical example: TREMORS System	Schindel�
	15:00	15:15	COFFEE / TEA BREAK	
5.9	15:15	15:45	Demonstration: Decision Support Tools for Monitoring, Detection, Assessment – Earthquake: Real-time Earthquake Display (CISN), USGS web site (CMT, ShakeMap, PAGER), URLs	Weinstein
5.10	15:45	16:30	TWC Operations: Sea Level Monitoring – Use, Instruments, Limitations, Challenges	Weinstein
5.11	16:30	17:00	Demonstration: Decision Support Tools for Monitoring, Detection, Assessment – Tsunami: Sea Level Monitoring (IOC web site, TideTool with Tsunami Travel Times), URLs	Weinstein
5-6			Day 4: Thursday, December 3, 2015	
			MORNING	
			Tsunami Forecasting, What Happens When?	
5.12	9:00	9:45	TWC Operations: Travel Time Forecasting - Methods, Limitations, Uncertainty, Sensitivity Studies (Location, Depth, Magnitude)	Schindel�
5.13	9:45	10:30	TWC Operations: Wave Amplitude Forecasting – Methods, Limitations, Uncertainty, Sensitivity Studies (Location, Depth, Magnitude)	Weinstein
	10:30	11:00	COFFEE / TEA BREAK	
5.14	11:00	11:30	TWC Operations: Wave Amplitude Forecasting (contd)	Weinstein
5.15	11:30	12:30	Group Activity: 1. Improving Response – What Happens When timeline? 2. Reliable and Unreliable Information (if time permits)	1. Schindel�, Weinstein, 2. Mayne
	12:30	13:30	LUNCH	
			AFTERNOON	
			Tsunami Hazard Scenarios, Tsunami Exercise - Decision-making using PTWC Enhanced Products	
6.1	13:30	14:30	Tsunami Hazard Scenarios around the Pacific	Weinstein
6.2	14:30	15:00	ITP-Peru Tsunami Exercises - Decision-making using PTWC Enhanced Products - Introduction, Format, Conduct	Weinstein

	15:00	15:15	COFFEE / TEA BREAK	
6.3	15:15	16:45	Tsunami Exercise - Decision-making using PTWC Enhanced Products - Distant Pacific Scenario	Weinstein, Mayne, All
6-7			Day 5: Friday, December 4, 2015	
			MORNING	
			Tsunami Exercise - Decision-making using PTWC Enhanced Products, Final Discussion	
6.4	9:00	10:30	Tsunami Exercise - Decision-making using PTWC Enhanced Products - Local Pacific Scenario	Schindelé, Mayne, All
	10:30	11:00	COFFEE / TEA BREAK	
6.5	11:00	11:30	Tsunami Exercise - Decision-making using PTWC Enhanced Products - Local Pacific Scenario (wrap-up)	Schindelé, Mayne, All
6.6	11:30	12:30	Final Discussion: Peru Readiness and Next Steps	Weinstein, Schindelé, All
	12:30	13:30	LUNCH	
			AFTERNOON	
			Closing	
7	13:30	14:00	Admiral's closing speech Certificates and Closing Ceremonies	Peru, All