



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

Regional Training on “Strengthening Standard Operating Procedures for Tsunami Warning and the use of the ICG/PTWS SCSTAC Tsunami Advisory Products

**8-11 May 2018
Yulong Hotel, Haidian District, Beijing, China**

**Hosted by National Marine Environmental Forecasting Center (NMEFC)
China State Oceanic Administration (SOA)**

Trainers

Bernardo Aliaga, Programme Specialist, ICG/PTWS and ICG/CARIBE-EWS Technical Secretary, IOC Tsunami Unit, France

Satoshi Harada, Senior Coordinator for International Earthquake and Tsunami Information, Northwest Pacific Tsunami Advisory Center (NWPTAC), Japan Meteorological Agency (JMA), Japan

Dr. Laura Kong, Director, International Tsunami Information Center (ITIC), UNESCO IOC - NOAA, USA

Dr. Ishmael Narag, Officer-in-Charge, Seismological Observation & Earthquake Prediction Division, Philippine Institute of Volcanology and Seismology (PHIVOLCS)

Dr. Dailin Wang, Senior Oceanographer, Pacific Tsunami Warning Center (PTWC), NOAA, USA

Dr. Ye Yuan, South China Sea Tsunami Advisory Center, National Marine Environmental Forecast Center, State Oceanic Administration (SCSTAC, NMEFC, SOA), China

Zhiguo Xu, SCSTAC, NMEFC, SOA, China

Training Overview

The 4-day training will cover the explanation and use of the newly-inaugurated South China Sea Tsunami Advisory Center (SCSTAC) Products, the Japan Meteorological Agency's Northwest Pacific Tsunami Advisory Center (JMA NWPTAC) New Enhanced Products, and the Pacific Tsunami Warning Center (PTWC) Enhanced Products by National Tsunami Warning Centers and Emergency Response Agencies. Topics will cover the end-to-end warning process, warning center and emergency response challenges, community preparedness, advanced topics in operations, and the methodology, use, interpretation, and limitations of the SCSTAC, NWPTAC, and PTWC Products. Over the last 15+ years, with improvements in data quality, quantity, and real-time availability, TWC response times have dropped significantly from nearly an hour to 5-7 minutes for tsunami events. Our scientific understanding has increased, and better techniques with faster computing platforms are enabling us to quickly and reliably characterize the earthquake and numerically model the tsunami to forecast coastal wave height and impact, thus providing timely information to assist in tsunami warning decision-making.

At the ICG/PTWS-XXV (September 2013), Member States approved the start of the PTWC Enhanced Products on 1 October 2014. These products were the first large-scale modifications in decades, whereupon the PTWC ceased issuing Warnings and Watches, and now issues only informational tsunami wave forecasts. Public text products continue, but the additional graphical and statistical enhanced products are only sent to authorized Tsunami Warning Focal Points (TWFP). At the ICG/PTWS-XXVI (April 2015), Member States agreed that following the PTWC implementation, the NWPTAC should proceed with the development of its enhanced products. The NWPTAC enhanced products consist of an initial text message using information from a pre-established tsunami database, and are followed by text and graphical messages that include results from real-time simulations, and sent solely to NWPTAC TWFP. With IOC Circular Letter 2702 (13 December 2017), the JMA NWPTAC commenced issuance of its NWPTAC Enhanced Products in experimental mode on 20 December 2017, in parallel with its existing products.

At the ICG/PTWS-XXII (March 2017), Member States agreed to form a Task Team on the Establishment of a South China Sea Tsunami Advisory Center and accepted the offer of the Government of China to host the SCSTAC at the National Marine Environmental Forecasting Center (NMEFC). Through IOC Circular Letter 2706 (5 January 2018), the China's SCSTAC commenced trial issuance of its SCSTAC Products on 26 January 2018.

**ITP-SCS
PROVISIONAL AGENDA (4 May 2018)**

Ses sion	Start Time	End Time	Topic	Speaker
1-2			8 MAY 2018, DAY 1: SCSTAC Inauguration, Regional Training Overview, Country SOPs	
			MORNING	
	8:00		Assemble at Hotel Lobby and take bus for NMEFC.	
			SCSTAC Inauguration	
	9:00	9:30	Registration	China, IOC
	9:30	12:00	South China Sea Tsunami Advisory Center Inauguration	China, IOC
	12:00	13:30	LUNCH	
			AFTERNOON	
			Regional Training - Overview, PTWS-XXVII, Warning and Emergency Response	
1.1	13:30	14:00	Regional Training - Opening Ceremonies	China, IOC
1.2	14:00	14:15	Logistics and Administrative Items, Introductions, Course Overview	China, ITIC
2.1	14:15	14:30	ICG/PTWS-XXVII Outcomes, specifically for the PTWS Enhanced Products <i>Ref: ICG/PTWS-XXVII Summary Report, Tahiti, F.P., 28–31 March 2017</i>	Bernardo Aliaga, IOC
2.2	14:30	15:15	Responding Rapidly and Effectively: Tsunami Warning and Emergency Response Requirements and Timeline-driven SOPs <i>Ref:</i> 1. <i>Tsunami Early Warning Systems - Overview course manual (2017)</i> 2. <i>Plans and Procedures for Tsunami Warning and Emergency Management, Guidance for countries in strengthening tsunami warning and emergency response through the development of Plans and Standard Operating Procedures for their warning and emergency management authorities (IOC MG 76, 2017)</i>	Laura Kong, ITIC
	15:15	15:45	COFFEE / TEA BREAK - Group Photo	
			Regional Tsunami Sources, Country SOPs	
2.3	15:45	16:45	Seismotectonics and Historical and Potential Tsunami Hazards for the South China Sea region <i>Ref:</i> <i>Literature study of Tsunami Risk in the SCS and its Adjacent Basins (ICG/PTWS-WG SCS-IV, 11-12 Feb 2015)</i> 1. <i>Report on the survey for the inventory of past papers relevant to tsunamigenic zone identification, tsunami hazard assessment, and paleotsunami survey (ICG/PTWS-WG SCS-IV, 11-12 Feb 2015)</i> 2. <i>Summary Report - Scientific meeting of experts for coordinated scenario analysis of future tsunami events and hazard mitigation schemes for the South China sea region, 16-18 November 2015, Xiamen, China</i> 3. <i>Published journal papers</i> 4. <i>Public Education on Tsunami Hazard – South China Sea (IOTIC, 2017)</i>	Ishmael Narag, PHIVOLCS, Ye Yuan, NMEFC
2.4	16:45	17:15	Country SOPs using SCSTAC, NWPTAC, and PTWC Products - 10-15 min/country (2 countries: Brunei Darussalam, China)	Aliaga, Countries
	17:30		Welcome Reception	China
2-3			9 MAY 2018, DAY 2: Country, PTWC, NWPTAC, SCSTAC SOPs	
			MORNING	
			Country SOPs	
2.4	8:30	10:15	Country SOPs using SCSTAC, NWPTAC, and PTWC Products - 10-15 min/country (6 countries: Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam)	Aliaga, Countries
	10:15	10:30	COFFEE / TEA BREAK	
			Warning and Response - What is Available and What is Wanted?	
2.5	10:30	11:00	Discussion: Country Readiness for Changeover - What is left to do, gaps, needs?	Aliaga, Kong, Countries
3.1	11:00	11:30	What do Tsunami Warning Centers (TWCs) provide to Tsunami Emergency Response (TER) agencies? <i>Ref:</i> 1. <i>TEWS Overview course manual (2017)</i> 2. <i>Plans and Procedures for Tsunami Warning and Emergency Management (IOC MG 76, 2017)</i>	Dailin Wang, PTWC

3.2	11:30	12:00	What do TERs do with TWC information? Challenges in Alerting, Evacuation, and Safe-to-Return (All-Clear) <i>Ref:</i> 1. TEWS Overview course manual (2017) 2. Plans and Procedures for Tsunami Warning and Emergency Management (IOC MG 76, 2017) 3. Tsunami preparedness: information guide for disaster planners, (IOC, MG 49, 2008)	Aliaga, Kong
	12:00	13:30	LUNCH	
			AFTERNOON	
			PTWC, NWPTAC, SCSTAC SOPs	
3.3	13:30	14:15	Pacific Tsunami Warning Center (PTWC) Enhanced Products - What, Why, SOPs (Criteria, Formats, Staging, Products) <i>Ref:</i> 1. User's Guide for the PTWC Enhanced Products for the PTWS (IOC TS 105 rev, Aug 2014, corr 14 Oct 2014) 2. PTWC Operations, Systems and Procedures Manual, v1.3.5 (2011)	Wang
3.4	14:15	15:15	Northwest Pacific Tsunami Advisory Center (NWPTAC) New Enhanced Products - What, Why, SOPs (Criteria, Formats, Staging, Products) <i>Ref:</i> A Draft Users Guide for the NWPTAC Enhanced Products for the Pacific Tsunami Warning System: Manual on Experimental NWPTAC Enhanced Products for PacWave17 (Jan 2017)	Satoshi Harada, NWPTAC
	15:15	15:30	COFFEE / TEA BREAK	
3.5	15:30	16:30	South China Sea Tsunami Advisory Center (SCSTAC) Products - What, Why, SOPs (Criteria, Formats, Staging, Products) <i>Ref:</i> 1. Technical Document: Tsunami Advisory Products for the South China Sea Regional Tsunami Warning and Mitigation System (IOC CL 2706, Oct 2017) 2. Arrangements for Consistency of Bulletins among PTWC, NWPTAC and SCSTAC within the South China Sea region (ICG/PTWS WG-SCS-VII, 6-8 Mar 2018, Hanoi Vietnam) 3. Summary Reports of ICG/PTWS Regional Working Group on Tsunami Warning and Mitigation in the South China Sea Region (WG-SCS) I to VII (2011-2018) 4. Summary Reports of ICG/PTWS Task Team on Establishment of the South China Sea Tsunami Advisory Center (SCSTAC) (2014, 2016)	Yuan
3-5			10 MAY 2018, DAY 3: TSP Guidance, Tsunami Emergency Response, Decision Support Tools, Tsunami Warning Operations - Advanced Topics	
			MORNING	
			Guidance, Warning Dissemination, Evacuation, Preparedness	
3.6	8:30	9:30	National SOP for TSP Enhanced Products - Guidance and Examples: Flow Charts, Criteria Tables, Timeline-driven SOPs, NTWC Message Templates, Guidance on use for National Warnings and Evacuation – Land and Marine Threats and Public Safety <i>Ref:</i> User's Guide for the PTWC Enhanced Products for the PTWS (IOC TS 105 rev, Aug 2014, English, corr 14 Oct 2014)	Kong
4.1	9:30	10:00	Case Studies: Warning Dissemination and Public Alerting – Requirements for JMA Tsunami Warning Service	Harada
	10:00	10:15	COFFEE / TEA BREAK	
4.1	10:15	10:30	Case Studies: Warning Dissemination and Public Alerting – US Hawaii Emergency Alert System	Kong
4.2	10:30	11:00	Emergency communications - Robustness, reliability, redundancy. Technologies for the downstream transmission of warnings to communities <i>Ref:</i> TEWS Overview course manual (2017)	Kong
4.3	11:00	11:30	Community Evacuations: Inundation Modeling, Evacuation Maps, Response Plans, Routes and Signage, Safe Return; Philippines example <i>Ref:</i> Preparing for Community Tsunami Evacuations: From Inundation to Evacuation Maps, Response Plans, and Exercises (draft, IOC MG, 2017)	Aliaga, Narag

4.4	11:30	12:00	Community preparedness and education – Tsunami Ready International, Schools, Businesses, Special Needs Populations, Tourism Sector; Philippines example <i>Ref: TEWS Overview course manual (2017)</i>	Kong, Narag
	12:00	13:30	LUNCH	
			AFTERNOON	
			Preparedness, Decision Support Tools, TWC and TSP Operations - Advanced Topics Earthquakes	
4.5	13:30	14:00	Marine Preparedness: Ports and Harbors	Harada, Kong
4.6	14:00	14:30	Ensuring Warning Center and Response Readiness – Exercises and Drills; Philippines example <i>Ref:</i> 1. <i>How to Plan, Conduct, Evaluate IOC Tsunami Exercises (IOC, MG 58, 2013)</i> 2. <i>Preparing for Community Tsunami Evacuations: From Inundation to Evacuation Maps, Response Plans, and Exercises (draft, IOC MG, 2017)</i>	Aliaga, Narag
5.1	14:30	15:15	Using Tsunami Warning Decision Support Tools for Hazard Assessment and Response Planning, Operational Monitoring, Detection, Assessment, Warning, Cancellation: Tsunami Coastal Assessment Tool (TsuCAT), CISON, Tide Tool with Tsunami Travel Times; IOC SL Monitoring web site <i>Ref: TEWS Overview course manual (2017)</i>	Kong
	15:15	15:30	COFFEE / TEA BREAK	
5.2	15:30	16:15	TWC Operations: Real-time Earthquake Detection and Fast Source Characterization - Sparse networks, Magnitudes, W-Phase Centroid Moment Tensors – Techniques, Use, Limitations, Challenges	Harada, Zhiguo Xu, SCSTAC
5.3	16:15	17:00	TSP Operations Panel (PTWC, NWPTAC, SCSTAC) on Earthquake Detection and Fast Source Characterization - Discussion and Question-and-Answer	Wang, Harada, Yuan
5-7			11 MAY 2018, DAY 4: Tsunami Warning Operations - Advanced Topics, Tsunami Exercise, Closing	
			TWC and TSP Operations - Advanced Topics Tsunamis, What Happens When timeline	
5.4	8:30	9:15	TWC Operations: Travel Time and Wave Forecasting - Techniques, Limitations, Challenges, Sensitivity (Location, Depth, Magnitude) – RIFT case studies	Wang
5.5	9:15	10:00	TSP Operations Panel (PTWC, NWPTAC, SCSTAC) on Travel Time and Wave Forecasting - Discussion and Question-and-Answer	Wang, Harada, Yuan
	10:00	10:15	COFFEE / TEA BREAK	
5.6	10:15	11:30	Learning Activity (individual followed by group discussion) – Tsunami Warning and Emergency Response Timeline - What happens when?	Wang, Aliaga
6.1	11:30	12:00	Exercise SCS-18 - Tsunami Table Top Exercise Setup and Ground Rules	Yuan, Narag, Aliaga (Exercise Controllers)
	12:00	13:30	LUNCH	
			AFTERNOON	
			Tsunami Exercise	
6.2	13:30	15:15	Exercise SCS-18 - Decision-making using TSP Products	Exercise Controllers, Small Groups. Observers
	15:15	15:30	COFFEE / TEA BREAK	
			Next Steps, Closing	
6.3	15:30	16:00	Final Discussion: Challenges for achieving end-to-end TWS: Data, Communication, Stakeholders, Evacuation, and other gaps. Country Readiness for Changeover – Questions, Answers, Next Steps	Trainers, All
7	16:00	16:30	Presentation of Certificates, Closing	China, IOC