



INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION  
COMMISSION OCÉANOGRAPHIQUE INTERGOUVERNEMENTALE  
COMISIÓN OCEANOGRÁFICA INTERGUBERNAMENTAL  
МЕЖПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ  
اللجنة الدولية الحكومية لعلوم المحيطات  
政府间海洋学委员会

UNESCO – 7 Place de Fontenoy - 75352 Paris Cedex 07 SP, France  
<http://ioc.unesco.org> - fax: +33 (0)1 45 68 58 12 - contact phone: +33 (0)1 45 68 39 83/84  
E-mail: [v.ryabinin@unesco.org](mailto:v.ryabinin@unesco.org)

**IOC Circular Letter N° 2721**  
(Available only in English)

IOC/VR/TA/BA  
3 May 2018

**To:** ICG/PTWS and ICG/CARIBE-EWS Tsunami National Contacts (TNC) and Tsunami Warning Focal Points (TWFP)  
ICG/PTWS and ICG/CARIBE-EWS Chairs and Vice-Chairs

**cc:** Official National Coordinating Bodies for liaison with the IOC Member States  
Permanent Delegations/Observer Missions to UNESCO of IOC Member States  
Permanent Delegates/Observer Missions to UNESCO and National Commissions for UNESCO of Brunei Darussalam, Cambodia, Federated States of Micronesia, Marshall Islands and Tokelau  
National Commissions for UNESCO in IOC Member States  
Permanent Observers to ICG/PTWS  
Director, International Tsunami Information Center (ITIC)  
Director, Pacific Tsunami Warning Center (PTWC)  
IOC Officers

**Subject:** **ITIC Training Programme—Hawaii (ITP-HAWAII in CHILE) on Tsunami Early Warning Systems and the PTWC Enhanced Products, Valparaíso, Chile, 1–10 August 2018**

Through this Circular Letter, members of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) and the Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions Member States (ICG/CARIBE-EWS), and countries in other regions with tsunami warning and mitigation interests, are invited to participate in the above-mentioned activity.

This year training is jointly conducted by the International Tsunami Information Center (ITIC) and the Servicio Hidrográfico y Oceanográfico de la Armada de Chile (SHOA). The ITP-Hawaii-Chile will use Chile as a working example of an end-to-end tsunami warning and mitigation system, with SHOA as its national warning centre. Historically, the ITP-Hawaii used Hawaii as a working example with PTWC as its warning centre. ITIC is hosted by the US National Oceanic and Atmospheric Administration (U.S.) and Chile in partnership with the IOC of UNESCO.

Over the last 10+ years, with improvements in data quality, quantity, and real-time availability, and in numerical methods, PTWC's response time has dropped significantly from an hour to within 5–7 minutes for tsunami events. In 2014 for the Pacific, and in 2016 for the Caribbean region, PTWC started issuing enhanced products that now include tsunami wave amplitude forecasts, thus

**Chairperson**

Prof. Peter M. HAUGAN  
Research Director II, Institute of Marine  
Research/Geophysical Institute  
University of Bergen  
P.O. Box 1870 Nordnes  
5817 Bergen  
NORWAY

**Executive Secretary**

Dr Vladimir RYABININ  
Intergovernmental Oceanographic  
Commission — UNESCO  
7 Place de Fontenoy  
75352 Paris Cedex 07 SP  
FRANCE

**Vice-Chairpersons**

Ms Monika BREUCH-MORITZ  
President  
Federal Maritime and Hydrographic  
Agency (BSH)  
Bernhard-Nocht-Str. 78  
20359 Hamburg  
GERMANY

Dr Alexander POSTNOV  
Deputy Director  
State Oceanographic Institute  
ROSHYDROMET  
6, Kropotkinsky Lane  
119034 Moscow  
RUSSIAN FEDERATION

Mr Ariel Hernan TROISI  
Head, Oceanography Department  
Navy Hydrographic Service  
Av. Montes de Oca 2124  
C1270ABV Buenos Aires  
ARGENTINA

Dr Somkiat KHOKIATTIWONG  
Marine Biodiversity Research Specialist  
Department of Marine and Coastal  
Resources  
Government Compact B  
Changwattana Road  
Laksi  
12010 Bangkok  
THAILAND

Dr Ashley S. JOHNSON  
Director, Oceans Research  
Department of Environmental  
Affairs  
Foretrust Building  
Martin Hammerschlag Way  
Foreshore  
SW Cape 8012 Cape Town  
SOUTH AFRICA

providing detailed information on the expected coastal impact for each country. In this respect, it is worth reminding that globally 90% of the casualties caused by tsunamis (99% in the Pacific) have been caused by local tsunamis that strike in a few minutes. Community awareness, education, and preparedness are paramount. For local warnings, tsunami warning centres (TWC) must have clear standard operating procedures that can be rapidly executed to issue alerts. TWC staffs must be well-trained and prepared to act quickly and decisively.

Recognizing that local tsunamis remain the most challenging operation for countries and the compelling needs of Member States for training, the 2018 ITP-Hawaii-Chile will focus on Standard Operating Procedures (SOP) for local tsunami warning and emergency response. The training will also include a local tsunami exercise that requires country decision-making and action using national tsunami products supplemented by the PTWC Enhanced Products. Depending on participant needs, additional topics with hands-on exercises and/or real case studies will be covered, such as real-time earthquake source characterization, tsunami forecasting, and/or tsunami evacuation mapping and response planning. The 2018 ITP-Hawaii-Chile programme description and provisional agenda are enclosed.

ITP-Hawaii-Chile is open primarily to all country members of ICG/PTWS and ICG/CARIBE-EWS. Participants from other ICGs are welcome. On Day 1, participants are expected to give a 15-minute presentation on their country's tsunami warning and mitigation system, including their tsunami SOPs. Participants are expected to provide their own travel funding. Organizations are kindly asked to confirm that funding is available to cover their participants to this course. SHOA will provide airport transfer to Valparaiso, lunches and break refreshments during the training. The training will be conducted in English and Spanish. More information and documents will be made available through the website <http://www.ioc-tsunami.org/ITP-Hawaii-Chile>.

Candidatures using the attached form should be sent together with a CV to the Associate Director of ITIC, Lt. Cdr. Carlos Zuniga ([czuniga@shoa.cl](mailto:czuniga@shoa.cl), Phone: +56-32-2266671), with copy to the Director of ITIC, Dr Laura Kong ([laura.kong@noaa.gov](mailto:laura.kong@noaa.gov), Phone: +1-808-725-6050, Fax: +1-808-725-6055) and to the ICG/PTWS Technical Secretary, Mr Bernardo Aliaga ([b.aliaga@unesco.org](mailto:b.aliaga@unesco.org)). Candidatures should be also endorsed by the country TNC or TWFP. The deadline for applications is **1<sup>st</sup> June 2018**. Successful candidates will be notified by 15 June 2018.

With the assurances of my highest consideration, I remain,

Yours sincerely,

*[signed]*

Vladimir Ryabinin  
Executive Secretary

Enclosures: (2)

ITP-Hawaii 2018 Programme Description and Provisional Agenda  
ITP-Hawaii 2018 Application Form

**UNESCO/IOC – NOAA – SHOA**  
**International Tsunami Information Center**  
**ITIC TRAINING PROGRAMME (ITP) – HAWAII IN CHILE**  
**1–10 August 2018**

The 2018 ITIC Training Programme (ITP-Hawaii in Chile) will be held from 1 to 10 August 2018 in Valapariso, Chile, hosted by the Servicio Hidrográfico y Oceanográfico de la Armada de Chile (SHOA). The Programme, under the direction of the International Tsunami Information Center (ITIC), provides participants with an overview of the history and operation of the Pacific Tsunami Warning and Mitigation System and the Caribbean and Adjacent Regions Tsunami Warning System. Specific focus is given to the important role of national tsunami warning centres in monitoring and evaluating the tsunamigenic potential of earthquakes, and in issuing timely tsunami warning messages to government emergency officials who can then act to save lives and reduce damage to coastal communities.

The Programme provides training and familiarization with the IOC-coordinated global tsunami warning and mitigation system, especially for the Pacific and Caribbean, and covers National Tsunami Warning and Emergency Response concepts of operations and standard operating procedures. The ITP-Hawaii in Chile will use Chile as a working example of an end-to-end tsunami warning and mitigation system demonstrating close stakeholder coordination and partnership for operational warnings and in preparedness activities. Participants will engage in a series of informational presentations and discussions at the national tsunami warning centre and disaster management agencies of Chile (SHOA, ONEMI, CSN), and visits to prepared communities.

To meet the training requests of Member States, the 2018 ITP-Hawaii-Chile will focus on Standard Operating Procedures (SOP) for local tsunami warning and emergency response, and will include a local tsunami exercise that requires country decision-making and action using national tsunami products, supplemented by the PTWC Enhanced Products. Specific efforts are made to review and strengthen individual country SOPs and Response Plans, focusing especially on the use and interpretation of the PTWC Enhanced Forecast Products. SOP guidance and template examples, and different tsunami warning decision support tools and software that are available will be demonstrated. Depending on participant need, additional topics using real-data hands-on or case studies will be covered, such as on seismology and real-time earthquake monitoring and tsunami forecasting for tsunami warning centres and/or community preparedness and evacuation mapping and planning for tsunami emergency management. On the last day, participants will role-play as tsunami warning centres or emergency response agencies responding to a tsunami. The 2018 ITP-Hawaii-Chile provisional agenda is attached.

On Day 1 of the Programme, participants should be prepared to make a 15-minute presentation on their country's tsunami warning system, including SOPs to use with the PTWC Enhanced Products, or on their plans for improving their SOPs.

Within one month after returning to their countries, ITP participants are asked to submit a Written Trip Report in English describing the activities they participated in, what they learned, and how they will use their training to improve tsunami warnings and/or awareness in their countries.

**ITP-Hawaii in Chile 2018  
1–10 August, Valparaíso, Chile**

**PROVISIONAL AGENDA**

	Topic
<b>1</b>	<b>WEDNESDAY , 1 AUGUST, DAY 1</b>
	<b>Welcome, Overview, Country Presentations, Science</b>
<b>1.1</b>	Programme Logistics
<b>1.2</b>	Course Overview, Manual, and Materials, including Awareness Materials
<b>1.3</b>	Country Presentations (15–20 min. each)
<b>1.4</b>	Earthquake and Tsunami Science – generation, propagation, impact
<b>1.5</b>	Global and Pacific / Caribbean Tsunami Historical Hazard and Potential Worst-case Scenarios
<b>1.6</b>	Tsunami Risk Assessment – Methods and Role of Tsunami Deposits
<b>1.7</b>	Tsunami Risk Assessment: Modelling and Mapping of Tsunami Inundation
<b>2</b>	<b>THURSDAY, 2 AUGUST, DAY 2</b>
	<b>IOC Tsunami Systems, End-to-End Warning, Decision Support Tools, TWC Operations</b>
<b>2.1</b>	UNESCO IOC Global Tsunami System: Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS), Intergovernmental Coordination Group for the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS)
<b>2.2</b>	Responding Rapidly and Effectively: End-to-end Tsunami Warning Systems – Requirements and Lessons Learnt
<b>2.3</b>	Chile example: Chile Tsunami Warning and Mitigation System
<b>2.4</b>	Tsunami Warning Decision Support Tools – Overview: Message Alerts, Real-Time Earthquake Display (CISN); Sea level monitoring (Tide Tool, IOC Sea Level Monitoring web site); Tsunami Databases (WDC/NCEI web tools), Tsunami Travel Time (TTT) calculation, Tsunami Coastal Assessment Tool (TsuCAT)
<b>2.5</b>	End-to-end Tsunami Warning – Stakeholder and their needs, Roles and Responsibilities, Standard Operating Procedures, and their linkages
<b>2.6</b>	What will Tsunami Warning Centres (TWCs) provide to Tsunami Emergency Response (TER) agencies? Operations Challenges and Limitations, and Lessons Learned from Past Tsunamis – Tsunami Warning
<b>2.7</b>	Pacific Tsunami Warning Center (PTWC) SOPs – seismic, geodetic, sea level monitoring, tsunami forecasting, dissemination
	1. Seismic Monitoring (Networks and latency, Source location, Magnitude, W-phase CMT) 2. Sea level Monitoring (Coastal and DART stations, run-up gauges, Tide Tool) 3. Tsunami Forecasting (RIFT, SIFT, ATFM)
<b>2.8</b>	Pacific Tsunami Warning Center (PTWC) Enhanced Products - What, Staging, Limitations summary
<b>2.9</b>	Understanding and acting on NTWC and PTWC Enhanced Products: Guidance and Examples for National Warnings and Evacuation – Flow Charts, Criteria Tables, Public Safety for Land and Marine Threats
<b>3</b>	<b>FRIDAY, 3 AUGUST, DAY 3</b>
	<b>Visit SHOA, Tsunami Emergency Management</b>
<b>3.1</b>	Visit SHOA Sistema Nacional de Alarma de Maremotos (SNAM) Chile SNAM SOPs, including seismic, geodetic, sea level monitoring, tsunami forecasting, dissemination, and products

3.2	Tsunami Emergency Response, Stakeholder Coordination, Roles, SOPs – Overview
3.3	Communication technologies for the transmission of tsunami warnings to local governments and communities – robustness, reliability, redundancy criteria for emergency communications
3.4	Warning Dissemination and Public Alerts: Information Flow and Role of Media – Japan, Hawaii, Chile
3.5	What do TERs want from TWCs? Challenges and Limitations in Alerting, Evacuation, and Safe-to-Return (All-Clear), and Lessons Learned from Recent Tsunamis
3.6	Building Preparedness: Tsunami Evacuation Maps, Plans, and Procedures
3.7	Building Preparedness: Tsunami Exercises and Drills, IOC Tsunami Exercise Guideline – Examples, including Chile
4	<b>SATURDAY, 4 AUGUST, DAY 4</b>
4	<b>Field trip, Past Tsunami evidence in Valparaiso and Quintero</b>
	<b>SUNDAY, 5 AUGUST - FREE DAY</b>
5	<b>MONDAY, 6 AUGUST, DAY 5</b>
5.1	Visit Chile National Emergency Operations Center (ONEMI, Santiago, Chile): Chile Emergency Agency Responses to SHOA and PTWC Tsunami Products
5.2	Tsunami Mitigation: Designing buildings for tsunami loading – National (USA, Chile) and International Building Codes
5.3	Marine Sector Readiness: Port and harbour response planning and warning dissemination
5.4	Public Awareness and School Education: International Perspectives – Examples, including Chile
5.5	Community Readiness: International Tsunami Ready Program, World Tsunami Awareness Day
6-7	<b>TUESDAY–WEDNESDAY, 7–8 AUGUST, DAYS 6-7</b>
	<b>IF NEEDED, SPLIT TWC AND TER SESSIONS - ADVANCED TOPICS</b>
<b>TWC</b>	FOR PARTICIPANTS INTERESTED IN TSUNAMI WARNING CENTRE OPERATIONS
<b>TWC 6</b>	<b>TUESDAY, 7 AUGUST, DAY 6</b>
	<b>Advanced TWC Topics – Earthquake Seismology</b>
<b>TWC - 6.1</b>	TWC Operations: SOPs for Distant, Regional, and Local Tsunamis: Monitoring, Detection and Evaluation, Communications, Message Dissemination
<b>TWC - 6.2</b>	TWC Operations: Real-time Earthquake Detection, Fast Source Characterization
<b>TWC - 6.3</b>	Seismic Data Interpretation – Location (techniques, use, limitations)
	Seismic Data Interpretation – Magnitude (methods, use, limitations)
<b>TWC - 6.4</b>	Seismic Data Interpretation – Focal Mechanisms (methods, including W-phase Centroid Moment Tensors solutions, use, limitations)
<b>TWC – 6.5</b>	Visit Chile National Seismological Observatory (tentative)
<b>TWC 7</b>	<b>WEDNESDAY, 8 AUGUST, DAY 7</b>
	<b>Advanced TWC Topics: Tsunami Forecasting</b>
<b>TWC – 7.1</b>	Teleseismic earthquakes – location and interpretation
<b>TWC – 7.2</b>	Local earthquakes – location and interpretation
<b>TWC - 7.3</b>	Seismic and tsunami hazard mapping – deterministic and probabilistic
<b>TWC – 7.4</b>	TWC Operations: Travel Time and Wave Forecasting – Techniques, Use and Limitations, Sensitivity Studies (Location, Depth, Magnitude)
<b>TWC – 7.5</b>	PTWC TWC Operational Forecasting – RIFT and SIFT Limitations and Uncertainties

<b>TWC – 7.6</b>	TWC Staff Training – participate in SHOA SNAM staff exercise
<b>TER</b>	FOR PARTICIPANTS INTERESTED IN TSUNAMI EMERGENCY MANAGEMENT AND EVACUATION OPERATIONS
<b>TER 6</b>	<b>TUESDAY, 7 AUGUST, DAY 6</b>
	<b>Tsunami Ready Community Recognition Program – Mitigation, Preparedness, Response guidelines – how to guidance, templates, challenges and limitations, best practice case studies (Chile, Japan, Hawaii, New Zealand, others)</b>
<b>TER - 6.1</b>	Community Resiliency – Implementing National Tsunami Ready Program
<b>TER - 6.2</b>	TER Mitigation: Creating Tsunami Hazard Maps and conducting Inundation Modelling
<b>TER - 6.3</b>	TER Preparedness: Creating Evacuation Maps and conducting Outreach and Public Education
	TER Preparedness: Conducting Exercises and Drills
<b>TER - 6.4</b>	TER Preparedness: Addressing Special Needs Populations, Tourism and Beaches
<b>TER - 6.5</b>	TER Response: Creating Tsunami Response and Evacuation Plans
<b>TER - 6.6</b>	TER Response: Managing Information Flow - Traditional Media, Social Media
<b>TER - 6.7</b>	TER Response: Implementing robust Public Notification and Alerting
<b>TER 7</b>	<b>WEDNESDAY, 8 AUGUST, DAY 7</b>
	<b>Advanced TER Topics: Response SOPs, TsuCAT, Visit Local Government EOC</b>
<b>TER – 7.1</b>	Timeline-driven NDMO/DMO SOPs – Roles and Responsibility, Stakeholder Coordination, All-Clear Safe-to-Return – Case Study, Wakayama, Japan
<b>TER – 7.2</b>	TER and Information Flow SOPs and Checklists: Templates and examples of SOP best practices.
<b>TER – 7.3</b>	Using TsuCAT for Response Planning and Exercise Development
<b>TER – 7.4</b>	Visit Local Community and Emergency Operations Centre. Evacuation of local population, including tourists, diverse, special needs sector Building community awareness and preparedness
	<b>RETURN TO JOINT SESSION</b>
<b>8</b>	<b>THURSDAY, 9 AUGUST , DAY 9</b>
	<b>Country SOPs, ITP-Hawaii 2016 Tsunami Exercise</b>
<b>8.1</b>	ITP-Hawaii-Chile Tsunami Exercise – Overview, SOPs, Checklists, Templates
<b>8.2</b>	Exercise Preparation: Improving Country SOPs using the PTWC Enhanced Products – Coordinated TWC/TER SOPs, and 1-on-1 country sessions
<b>8-9</b>	<b>FRIDAY, 10 AUGUST, DAY 10</b>
	<b>ITP-Hawaii-Chile 2018 Tsunami Exercise, Wrap-up, Closing</b>
<b>8.3</b>	Conduct ITP-Hawaii-Chile 2018 Tsunami Exercise
<b>8.4</b>	Post-Exercise Evaluation
<b>8.5</b>	ITP-Hawaii-Chile 2018 Logistics wrap-up; Course Materials
<b>8.6</b>	Summary Discussion - Way Forward, Next Steps, Gaps, Needs
<b>9</b>	Presentation of Certificates and Closing
	<b>FRIDAY–SATURDAY, 10–11 AUGUST, DAYS 10–11</b>
	Hotel Checkout - Depart for home country

**UNESCO/IOC – NOAA International Tsunami Information Center**  
**ITIC TRAINING PROGRAMME (ITP) – HAWAII IN CHILE**  
**1–10 AUGUST 2018**  
**APPLICATION FORM**

---

**APPLICATION DEADLINE: FRIDAY, 1 JUNE 2018**

**Please type or write in BLOCK letters in English**  
**Please submit by E-MAIL or FAX to:**

**E-MAIL:** czuniga@shoa.cl (SHOA)  
laura.kong@noaa.gov (ITIC)  
b.aliaga@unesco.org (IOC)

**FAX (ITIC):** +1 808 725 6055

**1. PERSONAL INFORMATION**

NAME	
TITLE	<input type="checkbox"/> DR. <input type="checkbox"/> PROF. <input type="checkbox"/> MR. <input type="checkbox"/> MS. <input type="checkbox"/> others _____
SEX	<input type="checkbox"/> MALE <input type="checkbox"/> FEMALE
NATIONALITY	
HOME ADDRESS	
TELEPHONE NUMBER	
FAX NUMBER	
EMAIL ADDRESS	

**2. PROFESSIONAL BACKGROUND**

OFFICE/ ORGANIZATION	
POSITION	
ADDRESS	
TELEPHONE NUMBER	
FAX NUMBER	
EMAIL ADDRESS	

**3. EDUCATIONAL BACKGROUND**

LEVEL	SCHOOL	DEGREE	YEAR GRADUATED
COLLEGE			
MASTER			
DOCTORAL			
POST DOCTORAL			

#### 4. TSUNAMI- RELATED TRAININGS ATTENDED

TITLE OR SUBJECT	CONDUCTED BY	DATES

#### 5. OTHER RELATED TSUNAMI-RELATED JOB EXPERIENCE

OFFICE / ORGANIZATION JOB DESCRIPTION	POSITION	DATES

#### 6. TRAVEL INFORMATION

NAME ON PASSPORT	
PASSPORT COUNTRY	
PASSPORT NUMBER	
BIRTHDAY (DD-MM-YYYY)	
DATE OF ISSUE	
PLACE OF ISSUE	
EXPIRY DATE	
COUNTRY OF BIRTH	
COUNTRY OF CITIZENSHIP	
NAME OF NEAREST INTERNATIONAL AIRPORT	

#### 7. OTHER

ENGLISH LANGUAGE PROFICIENCY	<input type="checkbox"/> Excellent	<input type="checkbox"/> Fair
	<input type="checkbox"/> Good	<input type="checkbox"/> Poor
SPANISH LANGUAGE PROFICIENCY	<input type="checkbox"/> Excellent	<input type="checkbox"/> Fair
	<input type="checkbox"/> Good	<input type="checkbox"/> Poor



DO YOU REQUIRE TRAVEL FUNDING	<input type="checkbox"/> Yes, Full Funding <input type="checkbox"/> Yes, Partial Funding, Amount USD ____ <input type="checkbox"/> No, Self-funded
-------------------------------	--

**STATEMENT OF INTEREST:**

**Why are you interested in attending this training?**

**What topics are you most interested in?**

**What additional topics you would like to learn about?**

**After the Training, where and how will the experience gained in the Training will be used?**

**PLEASE ALSO SUBMIT SEPARATELY YOUR CURRICULUM VITAE (CV).**

\_\_\_\_\_  
**PRINTED NAME**

\_\_\_\_\_  
**SIGNATURE**

\_\_\_\_\_  
**DATE**

**ENDORSED BY TSUNAMI WARNING FOCAL POINT OR TUNAMI NATIONAL CONTACT:**

\_\_\_\_\_  
**PRINTED NAME**

\_\_\_\_\_  
**SIGNATURE**

\_\_\_\_\_  
**ORGANIZATION**

\_\_\_\_\_  
**DATE**