



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> - contact phone: +33 (0)1 45 68 03 18
E-mail: v.ryabinin@unesco.org

IOC Circular Letter No 2831
(Available in English only)

IOC/VR/BA/eb
10 February 2021

To: Chairperson of TOWS-WG
Chairpersons of ICG/CARIBE-EWS, ICG/IOTWMS, ICG/NEAMTWS, ICG/PTWS
Chairpersons of GOOS, Joint WMO-IOC Collaborative Board and IODE
Tsunami National Contact in Chile
Tsunami National Contact in the United States of America
Organizations cooperating with UNESCO/IOC in the field of tsunami warning systems:
CTBTO, FDSN/GSN, GEBCO, IHO, IMO, UNDRR, WMO

Cc: IOC Officers
Chairpersons of Inter-ICG Task Teams

Subject: Fourteenth Meeting of the Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS-WG-XIV), 25–26 February 2021 (online)

Through Resolution XXIV-14, the IOC Assembly at its 24th session decided on the establishment of a Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG). The group is tasked primarily to advise the IOC Governing Bodies on coordinated development and implementation activities of warning and mitigation systems for tsunamis and other hazards related to sea level of common priority to all Intergovernmental Coordination Groups of Regional Tsunami Warning and Mitigation Systems.

By its Decision IOC-XXX/8.2 on the Tsunami and Other Coastal Hazards Warning Systems, the IOC Assembly in 2019 reaffirmed the need for continued inter-ICG coordination through TOWS and the extended tenure of its two inter-ICG Task Teams on:

- Disaster Management and Preparedness (DMP), and
- Tsunami Watch Operations (TWO).

Both task teams are holding online meetings on 22–23 February 2021 and will report to TOWS-WG-XIV, which in turn will report back to the forthcoming IOC Assembly next June. Agendas for the two Task Team meetings have been sent out separately to members of the TTs and are also available at the respective webpages:

Chairperson

Mr Ariel Hernan TROISI
Technical Secretary
Navy Hydrographic Service
Av. Montes de Oca 2124
C1270ABV Buenos Aires
ARGENTINA

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
c/o Secretariat of German IOC Section
Federal Maritime and Hydrographic Agency
Bernhard-Nocht-Str. 78
20359 Hamburg
GERMANY

Dr Alexander FROLOV
Assistant to the President
National Research Center "Kurchatov Institute"
Academika Kurchatova pl., 1
123182 Moscow
RUSSIAN FEDERATION

Mr Frederico Antonio SARAIVA NOGUEIRA
Navy Captain (Ret) Directorate
of Hydrography and Navigation
Rua Barao de Jaceguai S/N
24048-900 Niterói
BRAZIL

Dr Satheesh Chandra SHENOI
Former Director
Indian National Centre for Ocean
Information Services (INCOIS)
Pragati Nagar, Nizampet
P.O. 500090 Hyderabad
INDIA

Dr Karim HILMI
Head of Oceanography Department
Institut National de Recherche
Halieutique (INRH)
02, Boulevard Sidi Abderrahmane
Ain Diab
20180 Casablanca
MOROCCO

<http://www.ioc-tsunami.org/TTDMP21>

and

<http://www.ioc-tsunami.org/TTTWO2021>

The TOWS-WG meeting will be held online, through the GoToMeeting platform, on Thursday 25 (17:00-19:00 UTC) and Friday 26 February 2021 (12:00-14:00 UTC). The working language of the meeting will be English. To join both sessions please use the following link: <https://global.gotomeeting.com/join/743730741>

Further information and documents will be made available online via the TOWS-WG-XIV meeting website: <https://oceanexpert.org/event/2896>.

You are invited to communicate your availability to attend TOWS-WG-XIV by 20 February 2021 to the IOC Secretariat (e.borja-aviles@unesco.org and cc: b.aliaga@unesco.org).

With the assurance of my highest consideration, I remain,

Yours sincerely,

[signed]

Vladimir Ryabinin
Executive Secretary

Enclosures (2):

Provisional Agenda

Decision IOC-XXX/8.2 on the Regional Tsunami and multi-hazard Warning Systems

Limited Distribution



TOWS-WG-XIV/1 Prov.
Paris, 4 February 2021
English only

**Fourteenth Meeting of the Working Group on Tsunamis and Other Hazards
related to Sea Level Warning and Mitigation Systems (TOWS-WG-XIV) –**

25–26 February 2021 (Online)

PROVISIONAL AGENDA

- 1. OPENING AND WELCOME**
 - 1.1 OPENING
 - 1.2 ADOPTION OF AGENDA
 - 1.3 WORKING ARRANGEMENTS

- 2. REPORTS FROM PARTICIPANT BODIES**
 - 2.1 REPORT FROM IOC BODIES
 - 2.2 REPORT OF NON-IOC BODIES
 - 2.2.1 World Tsunami Awareness Day (UNDRR)
 - 2.2.2 World Meteorological organisation (WMO)

- 3. REVIEW OF PROGRESS**
 - 3.1 STATUS OF IMPLEMENTATION OF DECISION IOC-XXX/8.2

- 4. REPORTS OF THE INTER-ICG TASK TEAMS**
 - 4.1 INTER-ICG TASK TEAM ON DISASTER MANAGEMENT AND PREPAREDNESS
 - 4.2 INTER-ICG TASK TEAM ON TSUNAMI WATCH OPERATIONS

- 5. UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT**

- 6. OTHER ISSUES**

- 7. DATE AND PLACE OF THE NEXT MEETING**

- 8. CLOSURE**

Decision IOC-XXX/8.2

Tsunami and Other Coastal Hazards Warning Systems

The Assembly,

Having considered the executive summary reports of the recent sessions of the Intergovernmental Coordination Groups for: the Pacific Ocean Tsunami Warning and Mitigation System (ICG/PTWS-XXVIII), the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS-XII), the Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (ICG/CARIBE-EWS-XIV), the North-Eastern Atlantic, the Mediterranean and Connected Seas Tsunami Warning and Mitigation System (ICG/NEAMTWS-XV), and the report of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG-XII),

Accepts the reports by the IOC/ICGs and TOWS-WG;

Notes with satisfaction the progress made during the intersessional period, including:

- three exercises carried out (IOWave18, PacWave18, CARIBEWAVE 19) and regular communication tests performed, and with CARIBEWAVE 19 including a volcanic scenario for the first time,
- recovery and reconstruction of observation networks in the Caribbean following recent hurricanes,
- CARIBE-EWS Implementation Plan for 2018–2023 adopted,
- methodological guidelines “How to prepare, conduct, and evaluate a community-based tsunami response exercise” has been completed and is available in French, Spanish and English and under consideration of ICG/CARIBE-EWS for final publication,
- two communities in the Caribbean and Adjacent Regions (St. Patrick, Grenada, and Fort Liberté, Haiti) achieved UNESCO-IOC Tsunami Ready recognition, India and Oman testing Tsunami Ready, and growing interest for piloting Tsunami Ready expressed in NEAMTWS,
- Instituto Português do Mar e da Atmosfera (IPMA, Portugal) seeking accreditation as a Tsunami Service Provider in NEAMTWS,
- South China Sea Tsunami Advisory Centre (SCSTAC) intent to go to full operation, North West Pacific Tsunami Advisory Center (NWPTAC) to have made a full changeover to Enhanced Products at end of February 2019 and the Central American Tsunami Advisory Center (CATAC) plans to start trial operation,
- ITIC Training activities including the ITP-Hawaii course in Chile in August 2018 for the first time,
- European Commission’s support towards projects contributing to NEAMTWS, UNESCAP funding for Strengthening Tsunami Early Warning in the North West Indian Ocean Region, JICA and DIPECHO’s support for CATAC and Tsunami Ready and preparedness in Central America, new funding from DIPECHO and USAID/OFDA towards piloting Tsunami Ready programme in the Caribbean and Central America,
- PTWS completion of its Key Performance Indicators Framework,
- progress in sharing the results of tsunami exercises and communication tests with World Meteorological Organization (WMO) and the improvements in alert message delivery rates

for IOTWMS,

- completion and submission of a Community White Paper "Ocean Observations Required to Minimize Uncertainty in Global Tsunami Forecasts, Warnings, and Emergency Response" to the OceanObs19 Conference;

I. **Pacific Tsunami Warning and Mitigation System (PTWS)**

Notes the establishment of a Working Group 2 Task Team to propose minimum competency levels for National Tsunami Warning Centre (NTWC) operations staff;

Notes the establishment of a Working Group 2 Task Team to propose an optimal multi-instrument sensor network that integrates existing and emerging techniques and sensor technologies, for tsunami detection and characterization;

Welcomes the decision to organize and conduct the exercise Pacific Wave 2020 (PacWave 2020) in the months September to November 2020 and that it will be conducted as a series of regional exercises organized through the PTWS regional working groups;

Further welcomes the decision to develop a draft PTWS Medium-Term Strategy 2022–2029 for discussion by the PTWS Steering Committee in 2020, and approval by the ICG/PTWS-XXIX in 2021;

Recommends Member States with GNSS data to investigate the means of sharing this data in real time, with a view towards, and benefits of, improved tsunami impact forecasts for coastlines particularly for near-field events;

Decides to commence the full operation of SCSTAC on 5 November 2019, to be announced by the IOC Secretariat to WG-SCS Member States through an IOC circular letter at least 60 days in advance;

Decides to support the efforts and progress made by Nicaragua in the creation of the Central America Tsunami Advisory Centre (CATAC), as a tsunami service provider (TSP) within the framework of the ICG/PTWS;

Also decides to support the proposal to begin sending trial tsunami messages as of August 2019, based on the progress made in capacity-building for the establishment of the Central America Tsunami Advisory Centre (CATAC) using the official IOC ICG/PTWS list of NTWCs and TWFPs;

II. **Indian Ocean Tsunami Warning and Mitigation System (IOTWMS)**

Notes with appreciation the adoption of the IOTWMS Medium-Term Strategy (2019–2024) and conduct of Capacity Assessment of Tsunami Preparedness in IOTWMS Member States;

Notes the technical limitations of warning systems in producing timely and accurate forecasts for tsunamis from near-field and "atypical" sources (e.g. aerial landslides, submarine landslides, volcanoes), especially in light of the Palu and Sunda Strait tsunamis in Indonesia;

Notes with concern the continuing instances of Tsunami Buoy Vandalism in the IOTWMS region;

Notes with appreciation the progress made in bilateral exchange of seismic data among some Member States in the North West Indian Ocean and urges Member States to provide relevant seismic data in real-time to TSPs for accurate determination of tsunami threats;

Welcomes the establishment of two new inter-sessional Task Teams on “Tsunami Preparedness for a near-field Tsunami Hazard” and “Scientific Tsunami Hazard Assessment of the Makran Subduction Zone”;

Congratulates IOTWMS Member States for the success of IOWave18 exercise involving 116,000 participants and the piloting of Indian Ocean Tsunami Ready (IOTR) programme by India and Oman, and welcomes the priority to expand IOTR programme in vulnerable communities to enhance community preparedness and response;

Welcomes the decision to organise and conduct Indian Ocean Wave Exercise in 2020 (IOWave20);

III. Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE-EWS)

Notes that the CARIBEWAVE 19 exercise included a volcano-generated tsunami and it brought to light that effective PTWC procedures for such an event would likely require being alerted to an unexpected tsunami signal on a coastal sea-level gauge;

Further notes that a similar capability at PTWC would also be likely needed to respond to a landslide-induced tsunami;

Recommends that PTWC explore new techniques that would alert its duty staff to the arrival of potential tsunami signals on sea level gauges;

Urges Member States to continue to support the long-term operations of their national and local seismic, sea level, and Global Navigation Satellite System (GNSS) networks including accurate metadata so they can continue to sustain and improve the quality, timeliness and usefulness of the data for the delivery of optimal tsunami services;

Recommends ICG/CARIBE-EWS Working Group 1 to develop a strategy for all Member States who own and operate a Deep-ocean Assessment and Reporting of Tsunami (DART) buoy or DART-like system to ensure that both, data and metadata of these systems, are pro-actively shared by the owner States every time there is a new deployment, re-deployment, or simply on a regular basis to confirm no changes to their national array;

Appreciates Monaco for the funding it provides annually and which has been instrumental to increasing the number of sea-level stations and enhancing the capability of station operators through training; and thanks all Member States and organizations that are providing financial and technical assistance to CARIBE-EWS;

Also appreciates the contribution of the Caribbean Tsunami Information Centre (CTIC) in Barbados and calls on the IOC Secretariat and Member States for their continuous support for CTIC to ensure the sustainability of its functions and activities;

Welcomes the decision to organize and conduct CARIBEWAVE 20 exercise on 19 March 2020;

Notes the progress made and decides to continue to support the efforts of Nicaragua in the establishment of the Central America Tsunami Advisory Centre (CATAC), as a Subregional Tsunami Service Provider (SRTSP) within the framework of the ICG/CARIBE-EWS;

Decides to support the proposal to begin sending trial tsunami messages to the Central American countries within the area of service of the CARIBE-EWS by subscription as of August 2019, using the official list of National Tsunami Warning Centres (NTWCs) and Tsunami Warning Focal Points (TWFPs) of the ICG/CARIBE-EWS;

IV. North-Eastern Atlantic, the Mediterranean and Connected Seas Tsunami Warning and Mitigation System (NEAMTWS)

Recognizing the sub-optimal performance of the NEAMTWS due to lack of seismic and sea-level network notably in North Africa and difficulties of Member States in sharing observations due to national policy,

Encourages Member States to increase the number of seismic and sea-level stations available in North Africa and to share data using bilateral agreements whenever possible;

Noting the important future role of NEAM Tsunami Information Centre (NEAMTIC) in providing training and capacity building services,

Invites Member States to contribute to the further development of NEAMTIC through funding and secondments;

Welcomes the decision to organize and conduct the fourth NEAMTWS exercise in 2020 (NEAMWave20);

V. Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG)

Reiterates the importance of collecting event data strictly in accordance with the International Tsunami Survey Team (ITST) protocols, while continuing to be respectful of the country's needs and requirements;

Encourages timely data and information sharing by the Survey Teams to facilitate immediate submission of a consolidated summary report to the host country to assist with response and recovery planning; and

Requests ICGs to facilitate, in coordination with existing science organizations, special sessions at meetings/workshops to promote sharing of lessons learnt and compilation of all event data;

Encourages Member States to:

- increase and sustain technical and financial support of the tsunami and other coastal hazards warning systems in their respective regions;
- emphasize to national civil protection/disaster management agencies the role they play in strengthening the warning chain to ensure optimal community response; and stress the importance that the agencies participate in regional tsunami governance and technical forums;
- continue to strengthen tsunami awareness and preparedness in communities and among authorities through communication, evacuation planning, tsunami exercises, training, information, and piloting recognition programmes such as Tsunami Ready;
- densify sea-level networks capable of tsunami detection as well as seismic network particularly nearby tsunamigenic sources;
- extend sharing of real time tsunami source and tsunami detection observations;
- collect high resolution coastal bathymetry and extend the data sharing for improved characterization of tsunami and other coastal hazards and risks, and also advocate this through IHO and regional hydrographic commissions;

- register National Tsunami Warning Centres (NTWCs) and Tsunami Warning Focal Points (TWFPs) as alerting authorities in the “WMO Alerting Authority Register” via the WMO National Permanent Representative and in follow-up to a WMO circular letter;

Instructs ICGs to:

- advocate the Fourth edition of World Tsunami Awareness Day (WTAD 2019) among Member States and highlight target [d] of the Sendai Framework that stresses substantial reduction of disaster damage to critical infrastructure and disruption of basic services, with an emphasis on ports, harbours and vertical evacuation;
- consider the PTWS Key Performance Indicator Framework and provide input to a consolidated report for the 13th TOWS-WG meeting;
- continue the Tsunami Ready pilot activities with UNESCO-IOC recognition, including conducting surveys on Member State status, interest and feed back in the implementation of Tsunami Ready;
- consider the prospects for building warning systems for tsunami of non-seismic origin;

Accepts the reports from the Task Teams on Disaster Management and Preparedness and Watch Operations and instructs them to continue efforts for monitoring and responding to tsunamis generated by non-seismic sources and possible integration into tsunami watch operations;

Advocates that the UN Decade of Ocean Science for Sustainable Development (2021–2030) adopts an initiative aimed at developing a comprehensive global tsunami hazard assessment including all potential tsunamis, anywhere in the world, regardless of its source; enhancing sensing and analysis strategies to enable the rapid characterization of tsunami sources which are held as fundamental in transforming our ability to forecast and warn of local and/or non-seismic source tsunami threats; and strengthening community preparedness to enable efficient response to tsunamis from all sources;

Extends the tenure of TOWS-WG and its Task Teams on (i) Disaster Management and Preparedness and (ii) Tsunami Watch Operations, with Terms of Reference as given in IOC Resolution XXIV-4 [for TOWS-WG] and IOC/TOWS-WG-VI/3 [Annex II; for TTDMP] and ToRs for TTTWO as given in IOC/TOWS-WG-X Appendix I.