RECOMMENDATIONS

Recommendation ICG/PTWS-XXX.1

ICG/PTWS Governance

The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS),

Recalling IOC Resolution IV–6 that established the International Coordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU) and IOC Resolution XXXIX-8 that renamed ITSU to be the Pacific Tsunami Warning and Mitigation System (PTWS) and to provide continuity through the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS),

Reaffirming that the PTWS is a coordinated network of national systems and capacities, and is part of a global network of early-warning systems for all ocean-related hazards,

Noting:

- Sendai Framework for Disaster Risk Reduction 2015–2030 was adopted by UN Member States on 18 March 2015 at the World Conference for Disaster Risk Reduction (WCDRR),

- IOC Decision A-31/3.4.1 on Warning Mitigation Systems for Ocean Hazards approved the establishment of the Ocean Decade Tsunami Programme (UN ODTP) and a Scientific Committee (SC) to prepare the Draft 10-Year Research, Development, and Implementation Plan for this UN ODTP,

- IOC Decision A-32/3.4.1 on Warning Mitigation Systems for Ocean Hazards decided to endorse the 10-Year Research, Development and Implementation Plan of the UN ODTP as presented in document IOC/A-32/3.4.1.2.Doc(1), and also decided that warning systems for tsunamis generated by volcanoes should be considered and coordinated as part of the UNESCO/IOC Global tsunami and other Ocean-related Hazards Warning and Mitigation System (GOHWMS), and also when possible be part of a MHEWS;

Having reviewed the progress made in the implementation of the PTWS since the 29th Session of the ICG/PTWS,

Having considered the reports of:

- Working Group 1 on Understanding Tsunami Risk
- Working Group 2 on Tsunami Detection, Warning and Dissemination
- Working Group 3 on Disaster Risk Management and Preparedness
- Working Group 2 Task Team on Minimum Competency levels for National Tsunami Warning Centre (NTWC) operations staff
- Working Group 2 Task Team on the integrated PTWS sensor networks for tsunami detection and characterisation
- Working Group 2 Task Team of Tsunami Service Providers (TSPs)
- Working Group 2 Task Team on Seismic Data Sharing in the South West Pacific
- Task Team on PacWave Exercises, on PacWave22
- Task Team on Future Goals and Performance Monitoring

- Regional Working Group on Tsunami Warning and Mitigation System in the Central American Pacific Coast
- Regional Working Group on Tsunami Warning and Mitigation System in the South East Pacific Region
- Pacific Island Countries and Territories Regional Working Group on Tsunami Warning and Mitigation System
- Regional Working Group on Tsunami Warning and Mitigation System in the South China Sea Region
- Report of the Meeting of the PTWS Steering Committee, 6-9 March 2023
- 16th Meeting of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG-XVI), 2-3 March 2023
- North West Pacific Tsunami Advisory Center (NWPTAC)
- Pacific Tsunami Warning Center (PTWC)
- South China Sea Tsunami Advisory Center (SCSTAC)
- Central American Tsunami Advisory Center (CATAC)
- International Tsunami Information Center (ITIC)
- Reports of the ICG/IOTWMS, ICG/CARIBE-EWS,
- Chair's Report
- Secretariat Report

Having further considered the reports on:

- Report of the Task Team on Future Goals and Performance Monitoring
- UN Decade of Ocean Science for Sustainable Development (2021-2030) Research, Development and Implementation Plan for the UN ODTP (IOC Technical Series No 180)
- SPC initiatives on Disaster Risk Reduction and cooperation with PTWS
- ITU/WMO/UNESCO IOC Joint Task Force on SMART Cables
- NOAA/NCEI-WDS Integrated Tsunami Data
- Pacific Meteorological Council's Weather Ready Pacific Program

Acknowledging that the PTWS is effective in saving lives and reducing the impacts to communities in both near-field and distant-tsunami events through the three pillars of risk assessment and reduction, detection, warning and dissemination, and awareness and response,

Requests Member States to share any new forms of sea level data for tsunami warning purposes in accordance with the IOC Oceanographic Data Sharing Policy,

Decides to:

1. Continue *WG1 Understanding Tsunami Risk* with Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Co-Chairs are Chris Moore (USA, first term) and (VACANT);

2. Continue *WG2 Tsunami Detection, Warning and Dissemination* with Terms of Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXIX.1. Elected Chair is Mr Bill Fry (New Zealand, first term) and Vice-Chair(s) Lara Bland (New Zealand, first term) and Vasily Titov (USA, first term);

3. Continue *WG2 Task Team on the Integrated PTWS Sensor Networks for Tsunami Detection and Characterisation* with revised Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Co-Chairs are Ms Adrienne Moseley (Australia, first term) and Mr Tim Melbourne (USA, second term);

4. Continue *Task Team on Seismic Data Sharing in the Southwest Pacific* under the *Pacific Island Countries and Territories Working Group on Tsunami Warning and Mitigation System* (per ICG/PTWS-XXX.3), with Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Chair is Mr Rennie Vaiomunga (Tonga, first term), and Vice-Chair is Mr Mathew Moihoi (Papua New Guinea, first term);

5. Continue *WG3 Disaster Risk Management and Preparedness* with Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Chair Ms Ashleigh Fromont (New Zealand, first term) and Vice-Chair Ms Laura Kong (USA, second term);

6. Continue Sub-Regional Working Groups and Task Teams with same Terms of Reference except where noted:

   - *Regional Working Group on Tsunami Warning and Mitigation System in the South China Sea Region* with Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. The Chair and vice-chair to be elected at its eleventh meeting.
   - *Task Team on Capacity Development and Services* under the Regional Working Group on Tsunami Warning and Mitigation Systems in the South China Sea Region with Terms of Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. The Chair and vice-chair to be elected at its eleventh meeting.
   - *Regional Working Group on Tsunami Warning and Mitigation System on the Central American Pacific Coast* with Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Chair Ms Griselda Marroquin (El Salvador) and Vice-Chair Dr Wilfried Strauch (Nicaragua). The Terms of Reference for this group remains unchanged.
   - *Regional Working Group on Tsunami Warning and Mitigation System in the Southeast Pacific Region* with Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Chair is Mr Matias Sifon (Chile, first term) and Vice-Chair Mr Michael Linthon (Ecuador). The Terms of Reference for this group remains unchanged,
   - *Pacific Island Countries and Territories Working Group on Tsunami Warning and Mitigation System* with updated Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXIX.1. Elected Chair is Mrs Esline Garaebiti (Vanuatu, second term) and Vice Chair is Mr Mathew Moihoi (Papua New Guinea, second term), The Terms of Reference for this group remains unchanged.
   - *Pacific Island Countries and Territories Working Group Task Team on Capacity Development* with Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Chair is Mr Ofa Fa'anunu (Tonga, third term). The Terms of Reference for this group remains unchanged.

7. Continue the PTWS Steering Committee with revised Terms-of-Reference in order to strengthen its mandate and ability to deliver on the UN Ocean Decade goals. Revised Terms-of-Reference are attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1;

8. Continue *Task Team on PacWave Exercises* with revised Terms of Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Co-Chairs are Mr Laitia Fifita (Tonga, first term) and Ms Margarita Martinez (Chile, second term);

9. Continues *Task Team of the Tsunami Service Providers (TSPs)* under Working Group 2 with Terms of Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1, Elected Chair is Mr Charles "Chip" McCreery (United States, second term);

10. Dissolve the *Task Team on UN Ocean Decade*

11. Dissolve *Task Team on Future Goals and Performance Monitoring*;

12. Dissolve *WG2 Task Team on the Minimum Competency Levels for National Tsunami Warning Centre (NTWC) Operations Staff;*

13. Establish a *WG2 Task Team on Tsunami Generated by Volcanoes (TGV)* with Terms-of-Reference attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Co-Chairs are Mr Geoff Kilgour (New Zealand, first term) and TBD, and;

14. Establish a *WG2 Task Team on Forecasting from Ocean Observations* (TT-FOO) with Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Co-Chair is Mr Bill Fry (New Zealand, first term), and Mr Vasily Titov (USA, first term);

15. Establish a *WG3 Task Team on Tsunami Ready* with revised Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Elected Co-Chairs are Laura Kong (USA, first term), and Ashleigh Fromont (New Zealand, first term);

16. Establish a *Pacific Island Countries and Territories Working Group Task Team on Information Sharing Platforms* with Terms-of-Reference as attached in Appendix 1 to Recommendation ICG/PTWS-XXX.1. Interim Co-Chairs are Anthony Jamelot (France-French Polynesia, first term) and Jonathan Tafiariki (Solomon Islands, first term).

Decides to carry out an eleventh Exercise Pacific Wave in 2024 (PacWave 24) in the months of September through to November 2024 to support International Disaster Risk Reduction Day (13 October) and World Tsunami Awareness Day (5 November), as reflected in the Terms of Reference;

Expresses its gratitude to the Government of the Kingdom of Tonga for kindly hosting the 30th session of the ICG/PTWS in Nuku'alofa, Tonga;

Accepts with appreciation the kind offer of China to host the 31st Session of the ICG/PTWS in April 2025 in Beijing. Specific dates will be determined at a later stage;

Notes with appreciation the kind offer of France to host the 32nd Session of the ICG/PTWS in 2027 in Nouméa, New Caledonia;

Recognising the scope and scale of the tasks ahead, decides to increase the number of ICG/PTWS Vice-Chair positions to three.

Congratulates Chair Mr Yuji Nishimae (Japan) and Vice Chairs Mr Dakui Wang (China), Mr Wilfried Strauch (Nicaragua), and Mr 'Ofa Fa'anunu (Tonga) on their election to leadership of the PTWS.

Financial Implications: None

Recommendation ICG/PTWS-XXX.2

Understanding Tsunami Risk

The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS),

Noting and welcoming New Zealand deployed next generation DART buoys (DART 4G) in July 2021, with a higher sampling rate than the previous generation DARTs, and an electronic filter capable of filtering seismic noise from the hydrodynamic signal,

Further noting that during the 5 March 2021, Kermadec Subduction Zone earthquakes the DART buoys were successful in capturing tsunami wave observations and scientists were able to use these observations to underpin wave forecasts, leading to more rapid cancellation and the ability to provide a series of de-escalation forecasts to the national agency responsible for issuing tsunami warnings,

Also noting that Pacific Marine Environmental Laboratory (PMEL) of NOAA have recently updated the Tsunami Coastal Assessment Tool (TsuCAT). TsuCAT helps assess the possible impact of tsunamis from multiple sources,

Takes note of the outcomes of the Expert Meeting on Tsunami Sources, Hazards, Risk and Uncertainties associated with the Colombia-Ecuador Subduction Zone, held in Guayaquil, Ecuador, 27–29 January 2020,

And **also notes** the outcomes of the Expert Meeting on Tsunami Sources, Hazards, Risk and Uncertainties Associated with the Chile-Peru Subduction Zone held in Arica, Chile, 21-25 August 2023.

Agrees to support a scientific meeting of experts on the New Hebrides Trench; a meeting of Scientific Experts on the New Hebrides Trench would allow better assessment of uncertainties in tsunami hazard associated with this Subduction Zone and Back Arc. Situated between Vanuatu and New Caledonia, the Subduction Zone and Back Arc is extremely active, capable of producing >M7 earthquakes, that can be tsunamigenic.

Requests WG1 to:

- **Continue to support** Tsunami Hazard Assessment (THA) studies in the Pacific as part of comprehensive risk assessment, consistent with the first objective of the UN Ocean Decade Tsunami Programme (UN ODTP), to achieve 100% coverage for coasts at risk of tsunamis.

- **Support** and encourage regional workshops of seismic experts in tsunami sources. Such regional workshops are best way to include local experts into THA studies.

- **Support** further development of the tsunami hazard and risk assessment tools for use in THA (TsuCAT, ComMIT, Tweb and others).

- **Encourage** development of new and improved methods and promote use of best practices for THA.

- **Encourage** creation of a clearing house for access to the results of the THA studies.

- **Encourage** use of THA results for use in various IOC programs such as ITIC training, Tsunami Ready Program, IOC/ICG/PTWS WG 2 and WG 3 activities and UN ODTP.

- **Note** the small number of official country nominations to ICG/PTWS-WG 1 and promote further nominations through the Steering Committee.

Financial implications: None

Recommendation ICG/PTWS-XXX.3

Tsunami Detection, Warning and Dissemination

The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS),

Noting the intersessional ICG/PTWS adoption of interim Hunga Tonga Hunga Ha'apai (HTHH) warning processes and noting the IOC publication of CL 2882 and CL 2902,

Decides to establish permanent HTHH monitoring and warning procedures based on the products and methods in use by PTWC since March 2022 and presented in the CL 2882 and CL 2902.

Considering that the seismic zone in the Scotia Arc region is very active and have produced 33 earthquakes of magnitude 6.5 or greater since the year 2000, 13 of which were magnitude 7.0 or greater,

Recognizing that the Scotia Arc is not part of the PTWS Earthquake Source Zone,

Observing that the August 12, 2021, magnitude 8.1 earthquake in the South Sandwich Islands of the Scotia Arc produced a tsunami recorded widely, including throughout the Pacific and as far away as Alaska with amplitudes up to 0.19m,

Noting that parts of the PTWS coastal service area were as close as 4 hours tsunami travel time from that earthquake,

Recalling discussion of ICG/PTWS-XXIX.3 at the 15th session of TOWS-WG in February 2022, and the decision of the Steering Committee in March 2023, that the PTWS Earthquake Source Zone be expanded to include the Scotia Arc seismic region in order to routinely provide Member States of the PTWS with information about the frequent large earthquakes from this region, and any subsequent tsunami threat,

Decides to expand the PTWS Earthquake Source Zone to include an area from 63º to 52º south latitude and from 72º to 18º west longitude to include the Scotia Arc and its adjacent seismic zones.

Requests the IOC to change the PTWS Earthquake Source Zone map in TS 130, accordingly.

Noting advances in SMART Cable efforts in the Pacific and globally, and **noting** the advances in GNSS instrumentation and real-time processing, and noting the possibility of these advances to contribute to PTWS TEW goals,

Recommends WG2 continue to work closely with the JTF for SMART Cables and the IUGG GTEWS_Oceania project to utilize monitoring data from these efforts when they become available.

Noting the establishment of an Integrated Network Assessment Framework presented in WG2 report to ICG/PTWS-XXX, and **noting** the UN ODTP goal of proliferation of monitoring systems; and **also noting** the possibility of improvements to the global tsunami warning system through the incorporation of Member State data, and

Encouraging open sharing of data while respecting the data policies of each Member State,

Recommends the TT on Integrated Networks develop a framework based on the 10-Year Research, Development and Implementation Plan for the UN ODTP to create a pathway by

which Member States can contribute instruments, data, telemetry, etc., to support the UN ODTP tsunami detection, measurement and forecasting goals within the PTWS.

Noting challenges of telefaxing messages and the request from TT TSP presented in the WG2 report to ICG/PTWS-XXX,

Requests the Secretariat write to Member States to request feedback on the proposed changes to Telefax messaging, and also request Member States to indicate whether the proposed changes pose an unacceptable risk to their respective NTWCs and, if so, recommend those Member States work with their TSP to identify alternative methods for receiving TSP messages.

Noting the outcomes of the 7th ORSNET meeting, presented in Appendix 4 of the WG2 report, and the progress of WG2 Task Team on Seismic Data Sharing in the Southwest Pacific (TT-SDSSWP) during the intersessional period, and the complementarity of ORSNET and the Terms-of-Reference and regional focus of TT-SDSSWP,

Decides to move the TT-SDSSWP from WG2 to the Pacific Island Countries and Territories Working Group on Tsunami Warning and Mitigation System (WG-PICT).

Noting recommendations arising from the TT Minimum Competencies, and noting the submission of a Minimum Competency Framework to the IOC for consideration, and in anticipation that conditions around assessment of efficacy have been met,

Decides to dissolve this task team.

Noting the vast amount and variable nature of non-earthquake tsunami sources in the historical record, and noting the challenge of forecasting most non-earthquake tsunamis,

Decides to establish a WG2 TT on Tsunami Forecasting from Ocean Observations (TT-FOO), to investigate the use of TEW strategies based on direct ocean observations from available and emerging technologies.

Recognising the increase in scope and complexity of WG2 through the requested establishment of an additional two TT, bringing the total number to five, and rapid advances in TEW methods,

Decides to establish a WG2 TT to explore options for developing alternative warning strategies for tsunamis generated by volcanoes (TT-TGV).

Noting that the PTWC proposed some changes to its text product including putting the names of countries and territories with a potential threat in alphabetical order, organising the list of expected tsunami arrival times by country and territory, organising the list of observed tsunami amplitudes by country or territory, including an indicator for the type of observation made, and replacing the term “height” with “amplitude” which is more appropriate,

Agrees that PTWC implement these changes following notification to Member States by circular letter three months in advance in accordance with the change process put in place by ICG/PTWS-XXVI in 2015.

Concerned that one other proposed change, agreed to by ICG/PTWS-XXVI in 2015, to rename the forecast category labeled “less than 0.3 meters” and replace it with the label “no threat” indicates a level of danger rather than just the tsunami amplitude,

Decides to continue further discussion on this changes to the PTWC text products in the WG2.

Recalling Recommendation ICG/PTWS-XXVIII.2 on the TSPs Users' Guide,

Reviewed the common Table of Contents (see Appendix 2 of ICG/PTWS-XXX.8) proposed by the WG2 Task Team of TSPs,

Agreed with the proposed common Table of Contents for the four PTWS TSP Users' Guides.

Agreed that there is no longer the need for an overarching PTWS Users' Guide to replace the Operational User's Guide for the PTWS (TS 87) published in 2011, since its key content is covered by information in the four TSP User's Guides as well as by the Tsunami Watch Operations - Global Services Definition Document (TS 130).

Financial implications: None

Recommendation ICG/PTWS-XXX.4

Recalling the TOWS-WG approved the proposal on TSP Messages for the Maritime Community and requested the ICGs to consider the proposal for implementation in their respective basins in the TOWS-WG XII session,

Recalling IOC Assembly instructs the regional Intergovernmental Coordination Groups (ICGs) TSPs in collaboration with NAVAREA operators of the International Hydrographic Organization (IHO) test the tsunami maritime safety products in 2023/24, with a view to operationally implementing them in 2024-2025 in IOC Decision A-32/3.4.1,

Noting necessity of coordination with the IHO with regard to provision of tsunami maritime safety products,

Affirming that the Pacific basin is covered by seven NAVAREAs and NAVAREA coordinators,

Noting the NTWCs of some member states have provided the information to the tsunami at near coasts,

Considering differences of tsunami threat to vessels or ships offshore and near the coasts,

Noting recommendations from the WG2,

Recommends the PTWC to finalize necessary preparations to provide special tsunami maritime safety products specifically for ships for all NAVAREA Coordinators in the Pacific and in the Southwest Atlantic (e.g. NAVAREAs VI, X, XI, XII, XIII, XIV, XV, and XVI) to transmit to the NTWCs to be forwarded to the NAVAREA Coordinators of their countries, or upon their request directly to the NAVAREA Coordinators in the absence of a NTWC,

Requests the PTWS Steering Committee to finalise its decision at its next meeting on the provision of these products for a period of testing to be followed by a full operational implementation by the PTWC in 2024-2025,

Recommendation ICG/PTWS-XXX.5
Disaster Risk Management and Preparedness

The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS),

Notes the report of Working Group 3 (Disaster Management & Preparedness),

Notes the publication of IOC MG 74 Standard Guidelines for the Tsunami Ready Recognition Programme to support the implementation of Tsunami Ready,

Appreciates the long contributions of the ITIC to Member State capacity development and awareness-raising, and especially for its immediate support to Tonga after the HTHH volcanic eruption and tsunami in January 2022,

Notes the appointment of the Director of ITIC as the Chairperson of the Tsunami Ready Coalition in February 2023,

Notes the publication of the report of the Midterm Review of the Implementation of the Sendai Framework for Disaster Risk Reduction 2015 -2030,

Encourages Member States to continue to share outcomes and progression towards 100% Tsunami Ready goal with WG3, including communities that are already considered compliant through national standards,

Mandates the ITIC to continue to facilitate implementation and data collection regarding Tsunami Ready compliance in PTWS,

Notes the challenges Member States may face in reaching the Ocean Decade tsunami resiliency goal as listed in the Terms-of-Reference given to WG3 at the ICG/PTWS-XXIX,

Recalling the ICG/PTWS-XXIX.1 recommendation for WG3 to explore ways to recognize communities that choose not to implement the UNESCO IOC Tsunami Ready Recognition Programme as compliant with the Tsunami Ready Indicators,

Notes with appreciation the work of WG3 through its Information Document “Recognition in Countries with existing Tsunami DRR Programmes”, proposing a Tsunami Ready Equivalency Approach that seeks to enable reporting of tsunami preparedness in a manner compatible with the UNESCO IOC Tsunami Ready Recognition Programme, using existing national administrative frameworks and reporting requirements, and without requiring formal UNESCO IOC recognition,

Endorses the proposed approach, and

Establishes a Task Team for Tsunami Ready under WG3 with Terms of Reference as listed in Appendix 1 of ICG/PTWS-XXX.1,

Recommends WG3 develop formal guidance for ICG/PTWS on the application of the proposed Tsunami Ready Equivalency Approach, led by WG3 TT on Tsunami Ready, in consultation with Regional Working Groups.

Notes and appreciates the contribution of the Task Team on Future Goals and Performance Monitoring in developing the Global Performance Monitoring Framework,

Recommends the latest version of the Framework be presented at the next TOWS-WG for endorsement of the global adoption by all ICGs, and

Recommends the TT DMP to work with the IOC Tsunami Unit to develop the web portal.

Recommendation ICG/PTWS-XXX.6

Start of Operation of Central America Tsunami Advisory Center (CATAC)

The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS),

Considering the report of the fourth meeting of the Regional Working Group for Central America of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS), held in Managua, Nicaragua, on 11 February 2019, and the recommendations of the fifth meeting of the Regional Working Group for Central America of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS), 15 November 2021 (Online),

Considering recent tsunamis on the Pacific (September 1992 and August 2012) and Caribbean Central America coasts (1991, 2009 and 2018), and the potential loss of life and economic impact caused by such possible future events,

Considering the Coordination Centre for the Prevention of Natural Disasters in Central America (CEPREDENAC) as the institution specialized in integrated disaster risk management in Central America and that harmonizes the approach to these priorities with the strategies and agendas of other specialized bodies of the Central American Integration System (SICA),

Considering the efforts of Central American countries and regional organizations to establish new seismic stations, to maintain existing stations, and to make progress in the exchange of seismic data to advance tsunami and earthquake warning and research capabilities in Central America,

Recalling and appreciating the technical cooperation provided by the Japan International Cooperation Agency (JICA) to Nicaragua for the creation of the Central America Tsunami Advisory Centre (CATAC) and the strengthening of the regional system, including technical training,

Decided 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 recalling that CATAC has been on trial mode as of August 2019,

Notes that CATAC elaborated a report to ICG/PTWS-XXX in PPT and Text formats about its development and the progress during the interim period 2022-2023,

Notes that CATAC elaborated a draft version of its Users Guide corresponding to the new standard proposed (25 Aug 2023) by ICG/PTWS Task Team of TSPs; taking into account the new processing methods, messaging formats and channels,

also **notes** that CATAC will discuss the final version (English) of the new User´s Guide in WG-CA, ICG/PTWS TT Task Team of TSPs, for decision, for the Pacific coast of CA. Thereafter the Spanish translation will be produced,

Recalling Recommendation ICG/PTWS-XXIX.5 which noted that the approval of both the ICG/CARIBE-EWS and IOC are necessary for the official full functional operations of CATAC,

Decides to admit the start of the official full functional operations of CATAC, starting after the IOC governing body meeting in 2024, with the specific starting date to be **decided** after the coordination with the ICG/CARIBE-EWS

Financial implications: None

Recommendation ICG/PTWS-XXX.7

Minimum competency levels for National Tsunami Warning Centre (NTWC) operations staff

The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS),

Recalling the requests from Pacific Island Countries in 2016 and at the Twenty-seventh Session of the ICG/PTWS-XXVII in 2017 for the PTWS Working Group Two to establish minimum competency levels for NTWC operations,

Recalling the Draft NTWC Competency Framework shared at the Twenty-eighth Session of the ICG/PTWS-XVIII in 2019, and the establishment of the Task Team on the Minimum Competency Levels for National Tsunami Warning Centre (NTWC) Operational Staff established under PTWS Working Group Two during this Session,

Recalling further the establishment of the Task Team on Capacity Development established under PTWS Regional Working Group for the Pacific Island Countries and Territories on Tsunami and Mitigation at Twenty-eighth Session of the ICG/PTWS-XXVII in 2019, to continue the development of a competency framework for National Tsunami Warning Centres personnel and pilot it in Australia, Vanuatu, Fiji, Samoa and Tonga, and report progress and lessons learned to ICG/PTWS WG 1, 2 and 3,

Appreciating the initiative of Tonga, ITIC, PTWC, and IOC to pilot the Draft NTWC Competency Framework with the Tonga Meteorological and Geological Services and the Solomon Islands Meteorological Services in Nuku'alofa, Tonga in October 2019,

Appreciating feedback to the PTWS NTWC Competency Framework from Task Team on Capacity Development Report to the Ninth Session of PTWS PICT WG in February 2023,

Noting the TOWS WG-XV (2022) request to its Inter-ICG Task Teams on Disaster Management and Preparedness and Tsunami Watch Operations to consider development of guidelines for a global NTWC competency framework based on the available set of documents and Pacific input, noting that implementation can be at a regional level,

Noting the TOWS WG-XVI (2023) appreciation of the intersessional progress of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS) to develop a National Tsunami Warning Centre (NTWC) Competency Framework (2019), and the ITIC's leadership to pilot training courses based on the Framework,

Noting the TOWS WG-XVI (2023) instruction to the regional ICG, notably the PTWS, and the ITIC to pilot the PTWS National Tsunami Warning Centre (NTWC) Competency Framework for endorsement by ICG/PTWS with the goal to develop a global framework for all ICGs to use,

Noting the United Nations *Early Warning 4 All* and *Weather Ready Pacific Programme* includes the need for timely and effective tsunami warnings in order to save lives, and the strategic importance of partnerships (e.g., IOC-WMO),

Recommends the approval of the PTWS National Tsunami Warning Centre competencies, framework, and training requirements, as described in IOC ICG/PTWS-XXX Working Document (Agenda 4.5) Report from the Task Team on the Minimum Competency Levels for National Tsunami Warning Centre (NTWC) Operational Staff.

Welcomes the ITIC proposal to pilot the PTWS Minimum NTWC Competency Framework through the development and conduct of a training course during the intersessional period, and report back on its outcome to the Thirty-first Session of the ICG/PTWS.

Recommends the ICG/PTWS WG 2 to report on the use of the Framework by Member States during the intersessional period to the Thirty-first Session of the ICG/PTWS.

Recommendation ICG/PTWS-XXX.8

UN Decade of Ocean Science for Sustainable Development (2021-2030)

The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS),

Recognizing the UN Decade of Ocean Science for Sustainable Development (2021-2030) as a once-in-a-lifetime opportunity to realize transformative ocean science solutions,

Recognizing the UN Decade of Ocean Science societal outcomes include a Safe Ocean, where life and livelihoods are protected from ocean-related hazards, such as tsunamis,

Recalling the IOC Symposium, "Advances in Tsunami Warning to Enhance Community Responses" (February 2018) that informed the TOWS WG on best practices and guidelines for the implementation and future development of the four regional tsunami warning and mitigations systems of the Global Tsunami Warning System,

Recalling Recommendation ICG/PTWS-XXVIII.6 for PTWS Member States to actively support the Ocean Decade through contributions of existing and new data, and promotion of the Decade programs as part of their national platforms and priorities,

Noting the recommendation of the 14th Session of the TOWS WG to establish a UN ODTP,

Considering the decision of the 32nd Assembly of the IOC (IOC Decision A-32/3.4.1) to endorse the 10-Year Research, Development, and Implementation Plan of the UN ODTP. as presented in document IOC/A-32/3.4.1.2.Doc(1)

Welcoming the endorsement of "Science Monitoring and Reliable Telecommunications (SMART) Subsea Cables: Observing the Global Ocean for Climate Monitoring and Disaster Risk Reduction, ID 94" as a UN Ocean Decade Project,

Further welcoming the UN Decade Project "Ocean Teacher Global Academy: Building Capacity and Accelerated Technology Transfer for the Ocean Decade",

Recognizing that in the context of the Decade, **'**Ocean Science' encompasses social sciences and human dimensions; the infrastructure that supports ocean science (observations, data systems); the application of those sciences for societal benefit, including knowledge transfer and applications in regions that are lacking science capacity; and the science-policy/user interface. The integration of traditional knowledge in ocean research will also be promoted in the context of the Decade,

Noting the ICG/PTWS-XXIX decision to establish a Task Team on the Ocean Decade under the PTWS Steering Committee with Terms of Reference ICG/PTWS-XXIX.1,

Noting also the ICG/PTWS-XXIX **decision** to include a permanent agenda item on the Ocean Decade in the Policy section of its regular meetings,

Appreciating the intersessional efforts of the SC TT Ocean Decade,

Noting the need for coordination between the ICG/PTWS and its working groups in order to fulfil the UN ODTP goals for the PTWS,

Noting the strong leadership and strategic oversight required to implement the UN ODTP

Recognising that the Steering Committee has responsibility for strategic direction and coordination across all PTWS activities, including Ocean Decade,

Also **recognising** that the Steering Committee has the authority to invite additional members for advice on specific topics,

Decides to dissolve the SC TT Ocean Decade, and

Recommends strengthening the mandate and ability of the Steering Committee to deliver on the Decade goals by modifying its Terms of Reference as contained in Appendix 1 to the Recommendation ICG/PTWS-XXX.1.

Financial implications: None

Appendix 1 to Recommendation ICG/PTWS-XXX.1

Terms of Reference

Working Group 1:
Understanding Tsunami Risk

1. Develop and promote best practice tsunami risk assessment material, programmes, standards, and tools for understanding tsunami risk, to support emergency management and early warning, including but not limited to:
   - hazard assessment and coastal inundation models and products
   - risk assessment methodology and risk forecasting
   - scenario assessments including maximum credible and most likely events to understand likely exposure, vulnerability, and event frequency
   - forecast and threat models
   - evacuation and inundation modelling
   - use of new and improved data including digital elevation modelling (DEM), GNSS and paleotsunami information
2. Work with scientific experts to support Member State tsunami risk assessment.
3. Improve best practice for assessing risk of local source and non-seismic tsunami sources.
4. Develop projects to address gaps or areas for improvement in tsunami risk assessment, this may include land-use planning, vertical evacuation or supporting early warning improvements.

The Group will be composed of members nominated by Member States, with two co-chairs, one from a science and one from a disaster risk management background, to be elected.

Terms of Reference

Working Group 2:
Tsunami Detection, Warning and Dissemination

1. Liaise with other working group(s) and Task Team(s) within the ICG/PTWS and with working groups from the other ocean basins through the TOWS-WG to:

2. Develop, coordinate, and enhance operational implementation of interoperable tsunami threat information products and services.

3. Undertake studies to determine warning requirements for seismic and sea level data.

4. Monitor and report on the performance of key observational, warning and communication system components.

5. Contribute to the conduct of regular exercises and communication tests of the PTWS.

6. Identify areas of priority for action following assessments, communications tests, exercises, and real tsunami events.

7. Develop and maintain relevant documentation, such as the PTWS TSP User's Guides.

8. Provide advice to the International Tsunami Information Centre (ITIC) on educational materials and for capacity building about the warning systems and services.

9. Help strengthen the capacity and capability of Member States.

10. Provide advice to the PTWS considering emergent data and novel processing and forecasting technologies to support NTWC and TSP, ensuring alignment to the UN ODTP goals.

The Working Group will be composed of members nominated by Member States, representatives for each ICG designated TSPs, ITIC, and invited observers, with a Chair and two Vice-Chairs to be elected by the ICG.

Terms of Reference

WG2 Task Team:
Tsunami Service Providers (TT-TSP)

1. Share with each other their response to significant events including a timeline of actions, analyses made and the result of those analyses, decisions made and the basis for those decisions, the timeliness and accuracy of products issued, and any other notable successes or challenges.

2. Share with each other information about existing and any new methodologies for rapidly detecting and characterizing tsunami source events, for detecting and measuring tsunami waves, and for forecasting tsunami propagation and impacts.

3. Share with each other information on the effectiveness of products including format and content to make them understandable and actionable, dissemination methods and their testing, and any other support to customers prior to and during events.

4. Report to ICG on Task Team activities during the intersessional period as well as any resulting findings, changes, or recommendations regarding TSP operations.

The Task Team will be composed of representatives of PTWS Tsunami Service Providers (TSPs) and a representative from ITIC.

Terms of Reference

WG2 Task Team:
Integrated PTWS Sensor Networks for Tsunami Detection and Characterisation (TT-ISN)

This expert Task Team will establish and document a methodology to test the sensitivity of the PTWS sensing networks, integrating new and emerging techniques and technologies by:

1. Developing a methodology for gap and sensitivity analysis that combines multiple sensing technologies for tsunami detection and characterisation.

2. Integrating emerging techniques and sensor technologies (e.g. better use of tide gauges; GNSS technology and processing; sensors on SMART Cables) with the existing sensing network to meet tsunami warning service requirements in support of UN ODTP goals.

3. Where possible, include cost-benefit analysis of the potential technologies being considered.

4. Undertake to establish direct collaboration between ICG/PTWS Member States and other expert groups (such as International Association of Geodesy (IAG), International GNSS Service (IGS)) for the purpose of collaborating on data sharing and research efforts that are adaptable to the tsunami warning systems and operations of the IOC-Tsunami Programme, and aligned to the 10-year Research, Development and Implementation Plan of the UN ODTP.

5. Assess the utility and limitations of emergent technologies and techniques, e. g. GNSS, ADDOSS and SMART Cable, that have potential to deliver ocean height in real-time.

6. Align efforts with the *Task Team on Tsunami Forecasting from Ocean Observations* to ensure that Task Team recommendations account for existing and likely future observation systems.

7. Align efforts with the *Task Team for TSPs* and NTWC operational needs, to ensure that the Task Team recommendations consider the current and potential operational feasibility of emergent technologies augmentation for TSPs and NTWCs.

The Task Team will be open to TSPs, members nominated by Member States, and invited experts. Co-chairs to be elected by the ICG.

Terms of Reference

WG2 Task Team:
Tsunami Forecasting from Ocean Observations (TT-FOO)

1. Compare and document existing strategies for source-independent tsunami early warning and quantify and document their operational usefulness. Efforts will include consideration of both existing and emerging ocean observations technologies and techniques.

2. Connect with appropriate entities in the WMO and IOC Oceanographic communities to allow best-practice direct observation driven forecasting techniques to be assessed for their usefulness in Tsunami Forecasting from Ocean Observations.

3. Align efforts with the Task Team Integrated PTWS Sensor Networks to ensure that existing and likely future monitoring systems support TT recommendations.

The Task Team will be open to members nominated by Member States, invited experts. Co-chairs to be elected by the ICG.

Terms of Reference

WG2 Task Team:
Tsunami Generated by Volcanoes (TGV)

1. To confirm the list of volcanoes identified by the TGV as posing a potential threat to the Pacific (referred in Annex 4 Technical Series 183), to identify additional potential threat volcanoes, and continually review the list.

2. Among the volcanoes with potential tsunami threat, to identify those with implemented tsunami hazard assessment, monitoring, warning, and preparedness systems.

3. To establish direct collaboration between ICG/PTWS member states and IAVCEI to facilitate the contribution of PTWS tsunami expertise to the monitoring and warning capability of existing volcano monitoring centres or NTWCs, as appropriate.

4. To Identify potential volcanic partners in countries and international bodies, and recommend collaboration opportunities with them to improve tsunami early warning and to support the downstream decision makers affected by the volcanically-generated tsunami

5. To develop guidelines on SOPs to monitor, detect, warn, and prepare for any volcano-induced tsunami waves.

6. To develop guidelines on SOPs to monitor, detect, warn, and prepare for any volcano process that could induce tsunami waves.

The Task Team will be composed of members nominated by Member States, a representative from ITIC, and invited observers. Co-chairs to be elected by the ICG.

Terms of Reference

Working Group 3:
Disaster Risk Management and Preparedness

1. In collaboration with TOWS Task Team on Disaster Management and Preparedness and organizations such as UNDRR, support the exchange of experiences and information on risk reduction and preparedness actions, and matters related to disaster management.

2. Promote preparedness in coastal communities through education and awareness products and campaigns.

3. Facilitate SOP training across regions to strengthen emergency response capabilities of Member States and their Disaster Management Offices.

4. Develop and promote best practice preparedness material, programs, and assessment tools.

5. Develop and Promote tsunami risk reduction theory and practice.

6. Support the ITIC of the ICG.

The Group will be composed of members nominated by Member States, regional organisations, a representative of ITIC with a Chair and a Vice-Chair to be elected by the ICG.

Terms of Reference

WG3 Task Team:
Tsunami Ready

This expert Task Team will facilitate and coordinate efforts relating to the Tsunami Ready Recognition Programme and within the ICG/PTWS, in support of UN Ocean Decade Goals.

1. Develop formal PTWS guidelines following the 'Tsunami Ready Equivalency Approach' for recognition of tsunami readiness of communities not implementing the IOC Tsunami Ready Recognition Programme,

2. Monitor Tsunami Ready campaigns and outcomes, and report results,

3. Ensure the advocacy for Tsunami Ready is aligned with other PTWS and IOC documents,

4. Advise on the Tsunami Ready workflow as it pertains to the PTWS and regions,

5. Support ITIC in its efforts to facilitate the implementation of Tsunami Ready in PTWS Member States,

6. Support ITIC's efforts to develop standardized training supporting Tsunami Ready under the framework of OTGA, such as through feedback on content and helping to test trainings before officially deployed,

7. Help to identify sources of funding in support of the implementation of Tsunami Ready,

8. Report progress on encouraging the standard text in the UNESCO-IOC Tsunami Ready signage for vertical evacuation, such as "Go to the designated building for vertical evacuation",

9. Report progress toward informing the public on the validity of the recognition, to be indicated on Tsunami Ready signage and on the certificate under the UNESCO-IOC Tsunami Ready logo.

The Group will be composed of members nominated by the Member States, representative of ITIC, with two co-chairs to be elected by the ICG.

Terms of Reference

Regional Working Group on Tsunami Warning and Mitigation System on the Central American Pacific Coast

1. To assist the Central American countries in the development, improvement and implementation of their National Tsunami Warning and Mitigation Systems, and the countries which are becoming new members of ICG/PTWS in their integration into the ICG/PTWS.

2. To request CEPREDENAC to support the development of CATAC in Nicaragua as interim Regional Tsunami Advisory Centre for all Central American countries.

3. To implement a regional communications and warning plan.

4. To facilitate Tsunami Hazard and Risk studies in the Central American Region.

5. To Serve as coordination point within the region for member states proposals related to UN ODTP objectives, including the SMART Cables initiative and advising the PTWS Steering Committee on details of such proposals for consideration.

The Group will be composed of members from Member States Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama, with a Chair and a Vice-Chair elected by the members of the Working Group and endorsed by the ICG.

Terms of Reference

Regional Working Group on Tsunami Warning and Mitigation System in the Southeast Pacific Region

1. To enhance regional capabilities in the Southeast Pacific Region for the Detection, Assessment, Warning and Dissemination of tsunami events, based on lessons learned and global trends, with the purpose of generating improvement opportunities for the National Tsunami Warning Centres (NTWCs) following the Sendai Framework priorities as a reference.

2. To facilitate cooperation in the establishment and upgrading of seismic and sea level stations and networks and communication systems in the region, and their interoperability in accordance with ICG/PTWS requirements, through the active participation of appropriate national delegates from Member States, in the Working Group 2: Tsunami Detection, Warning and Dissemination.

3. To improve the communication channels between the countries, according to the regional communications protocol established under Permanent Commission for the South Pacific (CPPS), through periodical tests using redundant systems.

4. To evaluate the merits of implementing the Tsunami Ready Equivalency Approach or the IOC Tsunami Ready Recognition Programme in the region.

5. To promote regional activities and join projects considering in-region capacity building and enhancing disaster preparedness for response as main efforts, according to the priorities number 1 and 4 of the Sendai Framework.

6. To facilitate capacity building and the sharing of sea level information among others, including the free and open exchange of data.

7. To improve the educational programs with regional criteria based on social, cultural, and economic reality, through the active participation of appropriate national delegates from Member States, in the Working Group 3: Disaster Risk Management and Preparedness.

8. To develop synergies with universities and academic centres to promote and to facilitate regional tsunami research in order to cope with regional needs.

9. To Serve as coordination point within the region for member states proposals related to UNODTP objectives, including the SMART Cables initiative, and advising the PTWS SC on details of such proposals for consideration

The Group will be composed of representatives nominated by the Member States of Chile, Colombia, Ecuador, and Peru, with a Chair and a Vice-Chair from each country rotating every two years, following an alphabetical order. In this context, the Vice-Chair will assume regional presidency for the coming period.

Terms of Reference

Regional Working Group on Tsunami Warning and Mitigation System in the South China Sea Region (WG-SCS)

1. To evaluate capabilities of countries in the South China Sea Region for providing end-to-end tsunami warning and mitigation services.

2. To ascertain requirements from countries in the South China Sea Region for the tsunami warning and mitigation services.

3. To promote and facilitate tsunami hazard and risk studies in the region.

4. To facilitate cooperation in the establishment and upgrading of seismic and sea level stations and networks and communication systems in the region.

5. To facilitate improvement of the education programmes on tsunami mitigation in the region.

6. To facilitate capacity building and the sharing of tsunami information in the region, including the free and open exchange of data.

7. To Serve as coordination point within the region for member states proposals related to UN ODTP objectives, including the SMART Cables initiative, and advising the PTWS SC on details of such proposals for consideration

The Group will be composed of members nominated by Member States Brunei, Cambodia, China, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam and invited experts with a Chair and Vice-Chair to be elected by the members of the Working Group and endorsed by the ICG.

Terms of Reference

WG-SCS Task Team:
Capacity Development and Services

1. To coordinate training workshops and other technical exchanges on topics related to earthquake and tsunami for enhancing the tsunami warning capabilities of the WG-SCS Member States.

2. To facilitate implementation of the International Staff Programme for short-term secondment of staff from WG-SCS Member States to SCSTAC on an annual basis.

3. To explore ways for furthering the sharing and exchange of relevant data and information in the South China Sea region.

4. To ascertain the latest requirements of WG-SCS Member States for tsunami advisory service provided by SCSTAC.

Membership: Representatives of Member States of the ICG/PTWS WG-SCS (Brunei Darussalam, Cambodia, China, Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam) and invited experts; representatives of PTWC and NWPTAC (JMA); with Chair and Vice-Chair to be elected by the ICG.

Terms of Reference

Pacific Island Countries and Territories Working Group on Tsunami Warning and Mitigation (WG-PICT)

The Pacific Island Countries and Territories Working Group on Tsunami Warning and Mitigation will contribute to the implementation to Framework for Resilient Development in the Pacific and is encouraged to share the results of the working group with the Pacific Resilience Partnership.

The working group aims to:

1. continually review and evaluate capabilities of and make recommendations for improvements to countries in the Pacific Islands and Territories (PICT) Region for providing end to-end tsunami warning and mitigation services.

2. support the involvement and contribution of PICT countries in the activities of the ICG/PTWS.

3. promote and facilitate the tsunami hazard and risk studies in the PICT region.

4. facilitate cooperation in the establishment and upgrading of seismic and sea level stations and networks in the region, and the interoperability of these systems in accordance with ICG/PTWS requirements.

5. facilitate training and capacity building in the end-to-end tsunami warning and mitigation system in the region.

6. encourage the sharing of tsunami information, including but not limited to the free and open exchange of data.

7. facilitate tsunami awareness in school curricula, and development and dissemination of public educational materials.

8. work in cooperation with PTWS Working Group 1, 2 & 3, and relevant task teams especially on activities that strengthen country capacity in tsunami warning, risk mitigation & emergency response.

Members composed of representatives from Pacific Island Countries and Territories (PICTs), Council of Regional Organizations in the Pacific (CROP) Agencies, ITIC and WMO. Chair and Vice Chair elected by the members of the Working Group and endorsed by the ICG.

Terms of Reference

WG-PICT Task Team:
Seismic Data Sharing in the Southwest Pacific

1. Advocate seismic data and related tsunami monitoring sharing in the region.

2. Advise Southwest Pacific countries on data sharing protocols, techniques, and technologies.

3. Work with Southwest Pacific Countries and partners to have a common data sharing policy.

4. Encourage Southwest Pacific Countries with existing or planned broadband seismograph stations to (i) join the International Federation of Digital Seismograph Networks (FDSN), (ii) use the standards developed by the FDSN for data exchange and (iii) take advantage of the data archiving and services provided by FDSN.

Members are representatives of Southwest Pacific Countries and territories (Australia, Fiji, France–French Polynesia, France-New Caledonia, New Zealand, Papua New Guinea, Samoa, Solomon Islands, Tonga, Vanuatu), PTWC, NWPTAC, Japan, and United States. Co-chairs to be elected by the ICG.

Terms of Reference

WG-PICT Task Team:
Capacity Development

1. Continue the implementation of minimum competency framework for National Tsunami Warning Centres personnel and work with the ITIC to pilot it with Australia, Fiji, Samoa, Tonga and Vanuatu, and report progress and lessons learned to ICG/PTWS WG 1, 2 and 3.

2. Continue to monitor and coordinate the Tsunami Ready Programme and TEMPP in Fiji, Cook Islands, Samoa, Solomon Islands, Tonga and Vanuatu and review the Tsunami Ready Checklist for schools and communities in PICT.

3. Continue to develop the guideline for National Tsunami Warning Centres in responding to local tsunami and report to WG 1, 2 and 3.

4. Develop an online survey of warning and mitigation capabilities in the Pacific Island Countries and Territories (Member countries and IOC).

The Task Team Members: Australia, Fiji, France-New Caledonia (Co-Chair), New Zealand, Papua New Guinea, Samoa, Solomon Islands, Tonga (Co-Chair), Vanuatu, ITIC, IOC, PTWC, SPC, SPREP. Co-chairs to be elected by the ICG.

Terms of Reference

WG-PICT Task Team:
Information Sharing Platforms

1. Propose a WG-PICT regional PacWave24 objective;

2. Based on Pacwave22 report, re-evaluate early / anticipatory information to be shared between NTWC and NDMO and which platform would be more adapted for each kind of information.

3. WhatsApp Guidelines:

   - Maintain mobile contact in order to keep the PICT PacWave22 group alive;
   - Obtain official mobile numbers of NTWC and NDMO
   - Develop a guideline for messages sent on WhatsApp

4. HF-Radio Guidelines:

   - Collect and collate feedback from monthly tests and recommend preliminary guidelines.
   - Membership of the task team is open to any technical communication expert on this platform

5. Email Listerv Guidelines:

   - Develop a guideline for messages shared by email (no acknowledgement, etc)
   - Update and add new e-mail into the Pacwave22 listserv handled by ITIC

6. Identify and list new and relevant platform(s) for Information Sharing

   - Other social media (e.g., Signal)
   - Mobile App Broadcast system
   - Dedicated (private) broadcasting information web-page.

The Group to be comprised of representatives from Pacific Island Countries and Territories (PICTs) and ITIC as members, Council of Regional Organizations in the Pacific (CROP) Agencies and WMO Regional Association V (RAV) as observers. Chair and Vice Chair to be elected by the members of the Working Group and endorsed by the ICG/PTWS.

Terms of Reference

PTWS Steering Committee

1. The Steering Committee shall act in an advisory capacity to the Chair of the ICG/PTWS during the inter-sessional period.

2. The Steering Committee shall coordinate and integrate the work of ICG/PTWS in the inter-sessional periods, as implemented through the various technical and regional working groups and task teams, including but not limited to:

   - Maintain the PTWS Medium Term Strategic Plan.
   - Monitor, maintain and update the PTWS Implementation Plan.
   - Develop a Strategy for funding PTWS activities.
   - Monitor the performance of the PTWS.
   - Guide the work and direction of the PTWS to help deliver the goals of the UN Ocean Decade Tsunami Programme in support of its 10-year Scientific Research Implementation and Development Plan.
   - Facilitate and report on PTWS contributions to the UN Ocean Decade Tsunami Programme and provide input to the Ocean Decade Tsunami Programme on behalf of the ICG/PTWS.

3. The Steering Group will be composed of the ICG/PTWS Officers (Chair and the Vice-Chairs), Chairs of the Technical and Regional Working Groups, Directors of the TSPs and ITIC, or their delegates, and other members' representatives by invitation of the Chair.

Terms of Reference

Task Team on PacWave Exercises

1. Design and carry out the eleventh Exercise Pacific Wave 2024 with the following characteristics:

- An exercise shall be conducted with the aim to test PTWS Tsunami Service Provider (TSP) arrangements, and Country preparedness arrangements and operational procedures to respond and recover from a destructive tsunami.
- An exercise shall be conducted with the following objectives:
    1. Test communications from the PTWS Tsunami Service Providers to Tsunami Warning Focal Points and National Tsunami Warning Centers of Member States.
    2. Test national communication and cooperation, and readiness within the country.
    3. Test regional communication and cooperation between Member States.

2. Prepare and Evaluate Exercise Pacific Wave 2024 (PacWave24), include that it will:

- Take place in the months of September through to November 2024 to support International Disaster Risk Reduction Day (13 October 2024, Sunday) and World Tsunami Awareness Day (5 November 2024, Tuesday),
- National exercises conducted within the intersessional period and before September, but not strictly as part of PacWave24, may be reported through the PacWave24 Post-Exercise evaluation survey.
- Be conducted as a series of regional exercises organized through the PTWS Regional Working Groups where applicable, with support from the PTWS TSPs and ITIC, involving all PTWS countries as part of the regular biennial Pacific Wave exercise conducted since 2006.
- Be conducted to include one live communications test from the PTWS TSPs to Member States on 5 November 2024, Tuesday at 00:00 UTC.
- Be conducted to include exercise activities over and above a table-top exercise. Possible exercise variations include:
    1. Consider conducting in real time during the daytime working hours with full staffing or simulating minimal staff during night-time or weekend hours.
    2. Consider testing country capability to carry out their warning and response responsibilities for the situation where one or more PTWS TSPs is not able to provide guidance in a timely manner.
    3. Consider conducting the exercise down to the community level, including where possible an extensive public awareness campaign.
    4. Consider conducting as a regional exercise to share national event and alert level information in a timely manner with neighbouring countries in order to better inform tsunami threat decision-making.
    5. Consider the Sendai Framework for Disaster Risk Reduction Global Sendai Framework for Disaster Risk Reduction seven global targets and four priorities for action, World Tsunami Awareness Day and/or the UN Decade of Ocean Science for Sustainable Development in designing the exercise.
- Exercise Pacific Wave 2024 will be announced by Circular Letter from the IOC to Member States before 31 January 2024.
- The Exercise Pacific Wave 2024 manual will

6. Include information on each regional exercise, such as through regional exercise manuals,
7. Inform Member States on the availability of exercise products for their region, including instructions to Member States regarding the distribution dates,
8. Include instructions to Member States regarding their participation and the evaluation instrument be prepared with content and structure similar to what was prepared for previous Pacific-wide exercises, but considering lessons learned on conducting exercises in a pandemic context, and any need to collect other additional information,
9. Include a compilation and summary of good practices for planning, conducting, and evaluating virtual exercise,
10. Be distributed by the IOC to Member States before 30 April 2024.

- Participating Member States are requested to complete and submit PacWave24 Exercise Evaluation Survey online by 15 December 2024 to complete (National/Exercise Survey + Live TSP Communications Test evaluation survey).
- Explore more automatic and efficient ways to compile the information, and accordingly implement subject to available resources.
- The Task Teak will define the survey questionnaire.
- The Task Team will compile the post-exercise evaluation survey and prepare the *Summary Report* with a list of recommendations for the PacWave24 exercise according to the following provisional calendar:

11. Announcement of PacWave24 to all Member States before 31 January 2024, in the form of an IOC Circular Letter announcing the exercise period and TSPs live communication test date and time;
12. PacWave24 National/Regional exercise period from 01 September to 31 November 2024;
13. TSPs live communication test, 05 November 2024, 00:00 UTC;
14. Deadline for PacWave24 online survey submission, 15 December 2024;
15. PacWave24 Exercise Draft Summary Report will be shared with Member States 10 days prior to ICG/PTWS-XXXI;
16. PacWave24 Summary Report will be published and posted at www.pacwave.info on 30 June 2025.

3. The Task Team will provide guidance for the conduct of the next Exercise Pacific Wave, tentatively planned for 2026.

4. The Task Team will be composed of members nominated by Member States, regional working groups, SPC, ITIC, and TSPs.

- Members are Chile, China, Colombia, Fiji, France-French Polynesia, France-New Caledonia, Guatemala, Indonesia, Japan, Republic of Korea, New Zealand, Panama, Solomon Islands, Tonga, USA (ITIC and PTWC), and Vanuatu.

Appendix 2 to Recommendation ICG/PTWS-XXX.8

Working Group 2
Tsunami Detection, Warning and Dissemination
Task Team on Tsunami Service Providers
Proposed Common PTWS TSP Users' Guide Table of Contents

In bold below is the structure and the main headings and sub-headings that should be included in all TSP Users' Guides. Other sub-headings, if necessary, would be at the discretion of individual TSPs based upon their unique capabilities, procedures, and products. Other common headings in all TSP User's Guides may be included, if necessary, with a consensus among the TSPs.

Change Log

The User's Guide is a living document that may require changes over time to reflect changes in TSP services, products, or other information. This section includes a table providing a brief description of any changes made, and the date of the change.

Executive Summary

This section may include some background information about the TSP, why the document exists, and a general summary of the document content.

1. Overview

1.1. Background

This section should contain background information about the country and organization that operates the TSP, why there is a need for the TSP, and how and when the TSP came into existence and how it is governed within the processes of IOC Tsunami Unit and the ICG/PTWS as well as within its own national organization.

1.2. Area of Service

This section should describe the coastal areas covered by the TSP and include a map indicating those coastal areas.

1.3. Earthquake Source Zone

This section should describe the seismic source area covered by the TSP and include a map of that area, ideally showing the seismicity and other potential tsunami sources such as active volcanoes. The section should note if sources other than earthquakes are also covered in some way. It should also note if any tsunami sources outside the normal Earthquake Source Zone will be covered if they produce tsunamis affecting the Area of Service.

1.4. Tsunami Hazard

This section should provide an overview of the known tsunami hazard for the Area of Service. It should include information about any significant historical tsunamis affecting the region as well as potential tsunamis that are not yet in the historical record.

2. Operations

2.1. TSP Facility

This section should contain information about the TSP operational facility including where it is located, what it contains in terms of an operations center, offices, IT and communications, how it is staffed overall and for 24x7 operations, and how it is backed up.

2.2. Operational Tools and Procedures

2.2.1. Tsunami Source Detection and Characterization

This section should primarily and generally describe the capabilities and procedures for rapidly detecting and characterizing large earthquakes and determining their tsunamigenic potential. The section should include a map of the seismic stations and any other sensors such as GNSS stations used for this task. It may also describe the same for other tsunami sources such as volcanoes or landslides if such capabilities and procedures exist.

2.2.2. Tsunami Wave Observations

This section should generally describe the capability for rapidly detecting and measuring tsunami waves that may produce hazardous impacts within the Area of Service, and also for monitoring tsunami waves impacting coasts within that area. It should include a map of those sensors that may be coastal sea level gauges, deep-ocean tsunameters, or other sensors.

2.2.3. Tsunami Forecasting

This section should generally describe tools such as those for tsunami travel time calculations and real-time or pre-run hydrodynamic models used for forecasting tsunami amplitudes and other impacts. It should include a brief description of their methodologies, constraining data, assumptions, strengths and weaknesses, and other characteristics.

2.2.4. Decision Support

This section should describe any tools employed by the analysts on duty at the TSP to to aid them in maintaining situational awareness as an event unfolds in order make soundly-based decisions regarding the tsunami forecasts, the types of products to be issued, and the content of those products.

2.2.5. Product Creation and Dissemination

This section should generally describe how the TSP products are created and disseminated. More detail about the products and dissemination methods is contained in later sections of the Guide.

2.2.6. Timeline

This section provides a general timeline and description of events that occur in carrying out TSP critical operations: from the source event (usually an

earthquake), to the source detection and alarms, source characterization and evaluation of hazardous tsunamigenic potential, travel time determinations, issuance of initial products, tsunami wave confirmation and measurement, tsunami impact forecasting, issuance of subsequent products with forecasts and observations, and issuance of a final product.

3. Products

3.1. Product Types and Criteria

3.1.1. Informational

This section should note that the TSP will issue products for large earthquakes that have occurred but that present no tsunami threat to the Area of Service. It should indicate the criteria for those products such as magnitude and depth thresholds. It should also contain information about any other situations when an informational statement would be issued – for example in the case of a very distant source when the tsunami threat to the Area of Service is still under evaluation. It could be noted that informational products will be the most frequent products and provide a general idea of their frequency based on the historical seismicity and how often it meets informational product criteria.

3.1.2. Threat

This section should contain basic information about how the TSP handles tsunami threat situations. The section may be divided into sub-headings that describe the different stages of the crisis through time that include: rapid source detection with a potential tsunami threat, a confirmed tsunami, a validated tsunami forecast, observed tsunami impacts, and the end of the tsunami threat. Included should be the criteria for issuing initial tsunami threat products such as the earthquake magnitude, depth, and onshore-offshore thresholds, and how those criteria map into the coastal areas named with a potential threat. It should also describe the criteria for issuing subsequent threat products based upon tsunami wave observations and on numerical forecast information, and again describe how this information is applied to indicate the level of impact along various coasts. If there are categories of threat such as a threat to marine areas, coastal flooding threat, or major tsunami threat, then the criteria for those categories should be defined. This section should also contain the criteria for issuing a final threat product indicating that the threat is largely over.

3.2. Product Content

3.2.1. Text Products

The categories of information and how it is organized in text products is described in this section. Each category may warrant its own sub-heading in the Table of Contents. These might include: Product Heading, Product Title, Earthquake Parameters, Current State of the Tsunami Evaluation, Threatened Coastal Areas, Forecast Arrival Times, Forecast Amplitudes, Tsunami Observations, and Tsunami Safety Information. Each of those sub-sections should provide sufficient detail to enable recipients to properly understand the text product and to base actions on the text product if necessary.

3.2.2. Graphical Products

This section should describe any graphical products that would be issued. Usually this would only be for threat messages. Each type of graphical product should be under its own sub-heading. These could include a forecast tsunami travel-time map, a tsunami propagation map showing forecast maximum amplitudes across the ocean basin, a coastal forecast maximum amplitudes map, and a tsunami gauge observations map. Each of those sub-sections should provide sufficient detail about each graphical product to enable recipients to properly understand them and use them to inform their actions if necessary.

4. Dissemination

4.1. Methodologies

This section needs to describe the various ways that TSP information about a potential or actual tsunami threat reaches Member State TWFPs and NTWCs as well as how any public information is more widely disseminated.

4.1.1. Products

TSP text and graphical products are disseminated by various electronic communication methods and each of these should be described in its own sub-heading. Only communication links and methods that are under the control of the TSP or related government or international organizations such as the WMO are included. Dissemination by commercial third parties is useful, of course, but unless the third party is intentionally fed products by the TSP, such as might be the case with social media outlets like Facebook, then they are not necessary to be included. Key methods such as the GTS, AFTN, email, fax, SMS, website, CISN, etc. should be included and described under their own sub-headings.

4.1.2. Customer Decision Support

TSP staff may reach out to customers during events to ensure they are aware of a tsunami situation and ensure they have received any TSP products issued. They may also provide additional information to help with customer decision-making. Any such procedures should be described in this section and listed under separate sub-headings when appropriate. Procedures of this sort might include: call-down lists, conference calls, chat rooms, social media, and mass media interactions. It should be noted if such procedures are prescribed procedures or are ad-hoc and voluntary depending on staff availability.

4.2. Communication Testing

This section describes how TSPs routinely ensure that their products are reaching Member State TWFPs and NTWCs in a reliable and timely manner and that they are able to quickly recognize and respond to those products when their coasts are threatened by a tsunami. Testing is typically accomplished by a variety of means including routine and/or surprise communication tests, tsunami exercises, electronic product receipt verification, and by other means. Each method employed by the TSP should be named in its own sub-heading

and described there. Part of ensuring that TSP products sent to TWFPs and NTWCs are recognized and viewed quickly also rests with The Member States. Their responsibility for responding to communication tests when necessary should be described and emphasized in this section. The IOC process for keeping their contact information up-to-date should also be described and emphasized.

4.3. Contact Information

This section should contain the contact information of the designated contact person(s) for the TSP including their name, physical address, email address, telephone number(s), and telefax number(s) if available. It should also include for reference similar contact information for the International Tsunami Information Center.

ANNEXES

I. Example Products

This annex should contain examples of TSP text and graphical products that cover the general range of what the TSP might issue – sample informational products, sample initial threat products, sample threat products with a forecast, sample threat products with observations, and sample final threat products. It could contain that sample threat suite for multiple source event scenarios if that would be useful. This section could contain sub-headings to make it easier for the user to locate particular sample products.

II. Forecast Points

This annex should contain a map or maps and table with the names and coordinates of geographical points used for forecast arrival times that may appear in text products. The annex should a table also contain a map or maps with the names and locations of points and/or coastal segments used for forecast maximum tsunami amplitudes given in products.

III. Observation Sites

This annex should provide maps and tables with the locations and key characteristics of the seismic, sea level, and any other observational stations that support their operation. This information will need to be only a snapshot of these stations at a given time since these data sources change frequently.