

Intergovernmental Oceanographic Commission
Reports of Meetings of Experts and Equivalent Bodies



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**Regional Working Group
of the PTWS on Tsunami
Warning and Mitigation for
the Pacific Islands Countries
and Territories (PICTS)**

Eighth Meeting

29 March–1 April 2021

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Eighth Meeting
29 March–1 April 2021

UNESCO 2021

ICG/PTWS-WG-PICTS-VIII/3
Paris, July 2021
English only

TABLE OF CONTENT

1. WELCOME AND OPENING OF SESSION.....	1
1.1. WELCOME	1
1.2. ADOPTION OF THE AGENDA	2
1.3. DESIGNATION OF RAPORTEURS	2
1.4. CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION	2
2. REVIEW OF THE OUTCOME OF PICT-WG SEVENTH MEETING.....	2
2.1. UPDATE FROM THE 28TH MEETING OF ICG/PTWS.....	2
2.2. UPDATE FROM ICG/ PTWS STEERING COMMITTEE MEETING	2
3. REVIEW OF TSUNAMI DETECTION, WARNING AND RESPONSE AND TSUNAMI MITIGATION IN THE REGION.....	3
3.1. REPORT FROM ICG/PTWS WORKING GROUP 2 (WG2) TASK TEAM SEISMIC DATA SHARING IN THE SOUTHWEST PACIFIC	3
3.1.1 WG2 Task Team Seismic Data Sharing in the Southwest Pacific Progress and Recommendations	5
3.2. REPORT FROM ICG/PTWS WG-PICT TASK TEAM CAPACITY DEVELOPMENT.....	6
3.2.1 WG-PICT Task Team Capacity Development Recommendations	8
4. UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT	8
5. COLLABORATION WITH OTHER BODIES.....	13
6. PRIORITIES AND FUTURE ACTION PLAN & ELECTION OF WG-PICT OFFICERS	14
6.1. PTWS POST-EVENT DEBRIEF AND HOT WASH FOR 4 MARCH 2021 KERMADEC ISLAND EARTHQUAKE	14
6.2. ELECTION OF WG-PICT OFFICERS.....	15
7. REVIEW OF WG-PICT TERMS OF REFERENCE	15
8. RECOMMENDATIONS TO THE 29TH SESSION OF ICG/PTWS	16
9. NEXT MEETING	17
10. CLOSURE OF MEETING	17

ANNEXES

- I. [AGENDA](#)
- II. [PROGRESS, DECISIONS AND RECOMMENDATIONS PACIFIC ISLANDS
COUNTRIES \(PICTs\) AND TERRITORIES REGIONAL WORKING GROUP ON
TSUNAMI WARNING AND MITIGATION & TASK TEAM ON CAPACITY
DEVELOPMENT](#)
- III. [LIST OF PARTICIPANTS](#)
- IV. [LIST OF ACRONYMS](#)

1. WELCOME AND OPENING OF SESSION

1.1. WELCOME

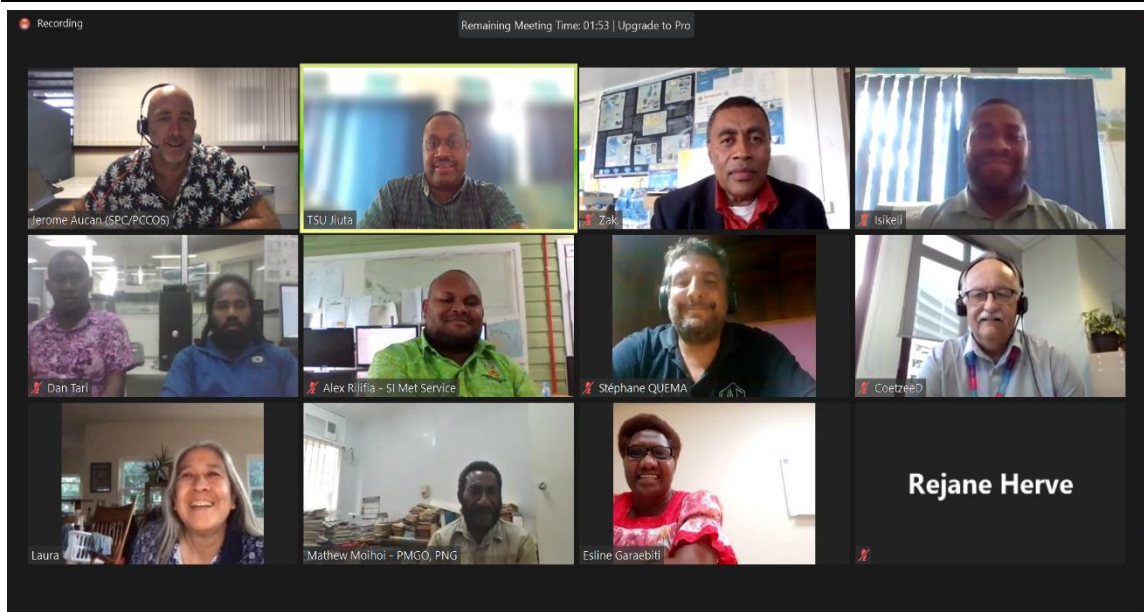
The Eighth Meeting of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS-VIII) Pacific Island Countries and Territories Regional Working Group on Tsunami Warning and Mitigation System (WG-PICT) was held online on 1 April 2021.

Session 1



A series of online meetings commenced on 29 March 2021 with the ORSNET Meeting, followed by the PTWS WG2 Task Team Seismic Data Sharing in the Southwest Pacific on 30 March 2021. Due to unforeseen circumstances, WG-PICT officers moved the WG-PICT Task Team Capacity Development Session scheduled for 31 March 2021 to 30 March 2021.

Session 2



Mr Jérôme Aucan, Chair of the PTWS (Pacific Tsunami Warning System) Pacific Island Countries and Territories Regional Working Group, warmly welcomed all participants attending the online meeting.

1.2. ADOPTION OF THE AGENDA

Mr Aucan presented the Agenda items for the two Sessions which had been circulated earlier. The Agenda was adopted without changes and included under [Annex II](#).

1.3. DESIGNATION OF RAPPORTEURS

Mr Isikeli Duwai from Fiji Mineral Resources Department and Mr Jiuta Korovulavula, IOC (Intergovernmental Oceanographic Commission) Secretariat, were proposed to serve as rapporteurs. The meeting accepted the proposal.

1.4. CONDUCT OF THE SESSION, TIMETABLE AND DOCUMENTATION

Mr Aucan provided an overview of the Agenda of the two online sessions. He suggested that if the Agenda items of Session One are covered earlier than expected, it would be prudent to move forward the Agenda items of Session Two.

2. REVIEW OF THE OUTCOME OF PICT-WG SEVENTH MEETING

2.1. UPDATE FROM THE 28TH MEETING OF ICG/PTWS

Mr Aucan updated the Meeting on the outcome of the 28th ICG/PTWS meeting held in Managua, Nicaragua, in April 2019. He noted that WG-PICT and its Task Team for Capacity Development Terms of Reference (TOR) were endorsed and extended for the next intersessional period.

The Meeting appointed Mr Ofa Fa'anunu as the Vice-Chair and endorsed the two newly elected officers for the WG-PICT, namely Mr Jérôme Aucan of New Caledonia, as Chair and Ms Esline Garaebiti of Vanuatu as Vice-Chair.

2.2. UPDATE FROM ICG/ PTWS STEERING COMMITTEE MEETING

Mr Aucan reported that three Sessions of the ICG/PTWS Steering Committee have been held since the 28th ICG/PTWS meeting.

In June 2020 during the ICG/PTWS Steering Committee meeting, the WG-PICT and Task Team Capacity development reported on progress achieved and challenges encountered.

He pointed out that due to COVID-19 pandemic travel restrictions, the Steering Committee Meeting reviewed its decision of holding the 29th meeting of the ICG/PTWS in Japan in two sessions. The sessions were earlier planned for September 2020 and January 2021.

The Meeting noted that in June 2020, the ICG/PTWS Steering Committee Meeting recognized the difficulty of conducting Exercise Pacific Wave 2020 (PacWAVE20) because of the COVID-19 pandemic. Accordingly, the PacWave20 will consist of the following:

- (i) TSP-TWFP communication test on 5 November 2020, and
- (ii) CATAC regional exercise.

Other activities are encouraged but at the discretion of Member States.

The Meeting noted that PTWS SC (Steering Committee) meeting supports the plan suggested by Japan. It requested Japan and the Secretariat to immediately embark on the alternatives of hosting the 29th Meeting of ICG/PTWS. This would entail:

- (i) The Meeting taking place as initially presented by Japan on 13-14 March and 15 -18 March 2021,
- (ii) A semi-presential meeting with reduced number of participants, combined with an online Session, and
- (iii) Postponement of the in-person Meeting for later in 2021 and an online Meeting in September 2020 to make the final decision.

The Meeting disclosed that the September 2020 PTWS SC Meeting decided to review the decision for the 29th Meeting of the ICG/PTWS in January 2021.

The Meeting noted that the PTWS SC Meeting held in January 2021 recommended the following:

- Postponement of ICG/PTWS meeting to November 2021, preferably around 5 November or March 2022,
- ICG/PTWS meeting dates to be reviewed in May/June 2021,
- Venue of ICG/PTWS meeting be moved from Sendai to Tokyo
- In view of any further new postponements, PTWS SC should request IOC Secretariat to develop rules for a complete online meeting,
- Officers to explore the possibility of a special session (online) to discuss urgent matters,
- That there be no elections,
- A full PTWS SC A meeting online in May /June,
- Circular Letter to inform Member States about SC decision and extended terms for Officers, and
- Extended terms for ICG PTWS Working Groups and Task Teams including Officers such as Chairs and Vice-Chairs until the next regular session.

3. REVIEW OF TSUNAMI DETECTION, WARNING AND RESPONSE AND TSUNAMI MITIGATION IN THE REGION

3.1. REPORT FROM ICG/PTWS WORKING GROUP 2 (WG2) TASK TEAM SEISMIC DATA SHARING IN THE SOUTHWEST PACIFIC

Mr Rennie Vaiomounga, chair of the PTWS WG2 Task Team Seismic Data Sharing in the Southwest Pacific, presented the Seventh meeting of the Task Team held online on 30 March 2021.

Mr Vaiomounga highlighted that the Seventh meeting of Task Team Seismic Data Sharing in the Southwest Pacific, agreed to continue with the PTWS WG2 Task Team Seismic Data Sharing in the Southwest Pacific in the next intersessional period with the following Terms of Reference:

- Advocate seismic data sharing in the region,

- Advice Southwest Pacific countries on data sharing protocols, techniques, and technologies,
- Work with Southwest Pacific countries and donors to ensure a common data sharing policy, and
- Encourage Southwest Pacific Countries with existing or planned 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 provided by FDSN.

It was noted that members are representatives of South 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 the United States.

The Seventh meeting of the Task Team Seismic Data Sharing in the Southwest Pacific recommended the nomination of Rennie VAIOMOUNGA from Tonga as Chair, Mathew MOIHOI from Papua New Guinea as Co-Chair and Pierre LEBELGARD and Sylvain TODMAN as ORSNET (Oceania Regional Seismic Network) technical adviser for the next intersessional period.

Task Team Members were pleased to be informed of the progress of the Sixth meeting of ORSNET Member States and their 2021–2022 priorities. The priorities are:

- (i) Upgrade the regional ORSNET server that is due for an upgrade.
- (ii) Continue the issue of earthquake bulletins notifications for tsunami warning systems as appropriate to members and Tsunami warning focal points for other PICs (Pacific Island Countries) upon request.
- (iii) Encouraged ORSNET Member States to expedite the signing of the ORSNET Regional Agreement document signed by Fiji.
- (iv) There are 33 out of 53 seismic stations that are currently operational, and Member States are encouraged to increase investment in maintenance and upgrade of existing stations and the installation of new seismic stations.
- (v) Continue efforts in expanding data-sharing efforts with French Polynesia and the volcanic seismic monitoring observatories in the region such as Rabaul Volcano Observatory (RVO).
- (vi) Encourage Member States to collaborate with The Pacific Community (SPC) consultants to provide the information required to issue a technical report on ORSNET needs and plans. The report should be ready and submitted to the ORSNET secretariat by April 15th, 2021.

The meeting maintained the current ORSNET focal point of Member States, namely:

- Tonga – Mr Rennie VAIOMOUNGA,
- Papua New Guinea – Mr Mathew MOIHOI,
- Fiji- Mr Isikeli DUWAI,
- Vanuatu – Ms Eslie GARAEBITI,
- Solomon Islands – Mr Kevin POROHOA,

- Samoa – Mr Lameko Talia,
- New Caledonia – Mr Pierre Lebellegard.

The meeting also proposed to have an alternate ORSNET focal point for Member States for redundancy purposes, namely:

- Tonga – Ms Yumi NAFE,
- Papua New Guinea – Mr Mikhail HERRY,
- Fiji – Mr Laisenia RAWACE,
- Vanuatu – Mr Dan TARI,
- Solomon Islands – Mr Jack BEN,
- Samoa – Mr Maleafatu LEAVASA, and
- New Caledonia – Mr Yann Fuselier

The meeting re-elected Ms Eslie GARAEBITI from Vanuatu as the Chair, Mr Rennie VAIOMOUNGA from Tonga as the Vice-Chair and Mr Isikeli DUWAI from Fiji as the Secretary and Ms Katie POGI from Samoa as Vice-Secretary for the following year.

Task Team members were pleased to be informed on the deployment of the New Zealand government DART network through the New Zealand Emergency Management Agency (NEMA) and GNS New Zealand.

It was noted that:

- The array network is expected to be fully deployed in 2021.
- The new DARTs are useful to improve PTWS network and PTWC warning products.
- Regionalized Southwest Pacific products are currently developed and require further effort to deliver effective and safe improvements to Tsunami early warning.
- The meeting recognized and supported the need to hold an Expert meeting on Tsunamigenic seismic data sources on the New Hebrides and New Britain trenches to strengthen tsunami modelling and inundation mapping in the Southwest Pacific.

The meeting pointed out that Member States should consider the alignment of seismic monitoring with the UN Decade of Ocean Science for Sustainable Development through the IOC Tsunami Programme, for visibility and funding opportunities.

3.1.1 WG2 Task Team Seismic Data Sharing in the Southwest Pacific Progress and Recommendations

The meeting was pleased to note the recommendations of the Task Team Seismic Data Sharing in the Southwest Pacific outlined below. It was agreed to re-establish the Task Team Seismic Data Sharing in the Southwest Pacific with the following Terms of Reference

- Advocate seismic data sharing in the region,
- Advice Southwest Pacific countries on data sharing protocols, techniques, and technologies,

- Work with Southwest Pacific countries and donors to ensure a common data sharing policy, and
- Encourage Southwest Pacific Countries with existing or planned 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 provided by FDSN.

It was noted that members are representatives of South 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 the United States.

- **Promote** and support the recommendations of the Sixth Meeting of ORSNET Member State.
- **Support** towards ORSNET continuing operations.
- **Recognized** and supports the need to hold an Expert meeting on Tsunamigenic seismic data sources on the New Hebrides and New Britain trenches to strengthen tsunami modelling and inundation mapping in the Southwest Pacific.
- **Encourage** the alignment of seismic monitoring with the UN Decade of Ocean Science for Sustainable Development through the IOC Tsunami Programme, for visibility and funding opportunities.
- **Support** the deployment of the New Zealand government DART network through New Zealand Emergency Management Agency (NEMA) and GNS New Zealand
- **Nominated** Rennie VAIOMOUNGA from Tonga as Chair, Mathew MOIHOI from Papua New Guinea as Co-Chair and Pierre LEBELLGARD and Sylvain TODMAN as ORSNET (Oceania Regional Seismic Network) technical adviser for the next intersessional period.

3.2. REPORT FROM ICG/PTWS WG-PICT TASK TEAM CAPACITY DEVELOPMENT

Mr Jiuta Korovulavula, IOC Secretariat, informed the meeting of the progress and recommendations of the WG-PICT Task Team Capacity Development Meeting held online on 30 April 2021, in the absence of Chairperson Mr Ofa Fa'anunu of Tonga.

The meeting was pleased to note the progress made by Task Team Capacity Development tabulated below.

Terms of Reference (TOR)	Progress at March 2021
1. Continue the development of competency framework for National Tsunami Warning Centres personnel and pilot it in Australia, Vanuatu, Fiji, Samoa, and Tonga and report progress and lessons learnt to ICG/PTWS WG1, 2, and 3.	<ul style="list-style-type: none"> • The meeting noted the collaboration between Tonga and ITIC (International Tsunami Information Center) Hawaii in 2019 on the Tsunami Warning Operations Training to pilot the NTWC (National Tsunami Warning Centres) competency framework for Tsunami Watchkeepers. • The meeting noted the effort of ITIC, Indonesia-IOTIC, and SPC under Ocean Teacher Global Academy (OTGA) and USP to provide a suite of tsunami courses that allows tsunami watchkeepers to attain micro-qualifications or an officially recognized qualification to enable them to issue a national tsunami warning.

Terms of Reference (TOR)	Progress at March 2021
<p>2.Continue to monitor and coordinate Pilot Tsunami Ready Recognition Pilot Programme and TEMPP in Samoa, Tonga, Fiji, Cook Islands, Solomon Islands and Vanuatu and review the Tsunami Ready Checklist for PICT (Pacific Island Countries and Territory) schools and communities.</p>	<ul style="list-style-type: none"> • Solomon Islands – 7 schools and nearby communities have yet to complete the Tsunami Ready Checklist • Vanuatu – NDMO led tsunami drill on Port Villa and Luganville in collaboration with other national agencies and NGO's. • Fiji yet to commence the implementation of the Tsunami Ready Recognition Pilot Programme. First, they have plans to review and update the tsunami warning and response SOP (Standard Operation Procedures) before linking it with community warning and response SOP. • Tonga conducted tsunami awareness and consultations with 17 schools and communities on Ha'apai and Vava'u island. 13 communities targeted Northern Ha'apai and Tongatapu. • Samoa plans to develop a monitoring and Evaluation Framework to strengthen existing guidelines to prepare all communities to be Tsunami Ready.
<p>3.Continue to develop the guideline for National Tsunami Warning Centres in responding to local Tsunami and develop competency for warning personal and report to WG1, 2 and 3; and</p>	<ul style="list-style-type: none"> • The meeting noted progress reported by Tonga on the use of the PTWS Draft Guideline of local source tsunami SOP at the 2019 ITIC-Hawaii training • The meeting also noted Fiji's plans to use the PTWS Draft Guideline of Local source tsunami SOP to develop Fiji's local source tsunami SOP. • The meeting also noted and recognized the Draft Design of Tonga Earthquake and Volcano Monitoring Network to strengthen oceans and geo-hazard early warning.
<p>4.Develop an online survey of warning and mitigation capabilities in PICTs (Member countries and IOC).</p>	<ul style="list-style-type: none"> • The meeting noted the outcome of the series of online survey and their recommendation and recognized the following capacity development or training gaps. <ol style="list-style-type: none"> a. Tsunami forecasting. b. Tsunami Ready & TEMPP c. End to End Tsunami Warning and Response SOP d. Tsunami Science e. Tide-Tool Training f. Tsunami Warning Centre Operations <p>NOTE: The above list of training gaps to be validated further with each Member States.</p> <ul style="list-style-type: none"> • Following a tsunami event, the meeting noted that countries to be encouraged to debrief and prioritize shared learning and experiences within the PTWS.

Mr Yuelong Mao highlighted that Australia National Tsunami Warning Centre personal piloted the National Tsunami Competency Framework. Trained Australian tsunami watchkeepers are

issuing national tsunami warning following the National Tsunami Competency Framework training.

Accordingly, Mr Mao recommended an amendment to the text of Task Team Capacity Development TOR item 1, where Australia is not on the list of countries to pilot the competency framework for National Tsunami Warning Centres personnel. The meeting recognized that Australia is suitably positioned to support PICTs in developing a national competency framework for National Tsunami Warning Centres personnel.

Dr Laura Kong informed the meeting that ITIC-Hawaii and Indonesia-IOTIC, and SPC are currently working on delivering a suite of tsunami courses under the OTGA.

Dr Laura Kong asked the Member States to confirm their priority training gaps identified by the 2020 online survey and the March 4th debriefs survey.

Consequently, the meeting noted that the training gaps need to be validated further with each Member State.

3.1.1 WG-PICT Task Team Capacity Development Recommendations

The meeting was pleased to note the recommendations of the Task Team Capacity Development outlined below. It was agreed to re-establish the Task Team Capacity Development with the following Terms of Reference:

- (i) Continue the development of competency framework for National Tsunami Warning Centres personnel and pilot it in Vanuatu, Fiji, Samoa, and Tonga as well as report progress and lessons learnt to ICG/PTWS WG1, 2, and 3.
- (ii) Continue to monitor and coordinate Pilot Tsunami Ready Recognition Pilot Programme and TEMPP in Samoa, Tonga, Fiji, Cook Islands, Solomon Islands and Vanuatu and review the Tsunami Ready Checklist for PICT (Pacific Island Countries and Territory) schools and communities.
- (iii) Continue to develop the guideline for National Tsunami Warning Centres in responding to local Tsunami and develop competency for warning personal and report to WG1, 2 and 3.
- (iv) Develop an online survey of warning and mitigation capabilities in PICTs (Member countries and IOC).

The Task Team Members—Australia, New Caledonia (Co-chair), Tonga (Chair), Samoa, Vanuatu, New Zealand, Solomon Islands, Fiji, would:

- **Assess** the effectiveness of online training,
- **Identify** best practices to roll out Tsunami Ready Program, e.g., working with partner agencies,
- **Request** regional partners to support bathymetric surveys and modelling, and
- **Encourage** countries to promote bathymetric data sharing among national and regional agencies.

4. UN DECADE OF OCEAN SCIENCE FOR SUSTAINABLE DEVELOPMENT

Dr Laura Kong gave a presentation on the UN Decade of Ocean Science for Sustainable Development (2021–2030) and the Inter-ICG Working Group on Tsunamis and other Hazard

related to Sea-level Warning and Mitigation Systems (TOWS-WG). It was acknowledged that her presentation is specific to the objectives of UN Decade.

The Meeting observed that the IOC established in 1960, is the only intergovernmental body of the UN System for ocean science. It has 150-Member States. One of the IOC capacity development, education and communication initiative components is early warning and services. IOC leads the implementation of science and observation system, Tsunami, sea level and earthquakes. There are knowledge gaps in ocean literacy and other technical topics.

It was further noted that oceanography focus continues to be in research. However, discussions within the Tsunami space that all research should evolve into something more practical such as operations or Tsunami Ready. This would move the research information gain into value-added action that makes a positive impact on day-to-day life.

The Meeting acknowledged that capacity in oceanography is hugely uneven, especially in developing countries and SIDS (Small Island Developing State). The goal of the Ocean Decade, while making advances in data, policy, or technology, is to ensure that no one is left behind. It is important that current efforts to build technology transfer or capacity development of human resources be of benefit to all.

Preparing the Decade

The Meeting noted that in 2018, there was a UN Resolution which proclaimed a Decade and IOC was given the lead role to develop the implementation plan. Regional Consultation was conducted between 2018 to 2020 that allowed IOC to put together several activities intended to achieve societal outcomes. In 2021 the implementation plan is envisaged to be endorsed to kick off Decade Actions.

The Meeting recognized the vision for the Decade "The science we need for the ocean we want." Dr Laura Kong highlighted that it is not business as usual for the Decade. The key question is "What can we do that is bold and transformative that improves life on earth through sustainable development and connects people and the ocean?"

The Meeting noted that the UN Ocean Decade is well aligned with the efforts of the Tsunami Community as outlined in the following Ocean Decade challenges, namely:

- (i) Pollution and Marine Debris.
- (ii) Ecosystem Protection and Restoration.
- (iii) Food Security and Sustainable Seafood.
- (iv) Economic Development.
- (v) Ocean-Climate Nexus.
- (vi) Multi-hazard warnings.
- (vii) Ocean Observing System.
- (viii) Digital Ocean Map and Data Portal.
- (ix) Capacity Development.
- (x) Social and Behavioral Barriers to Change.

It was emphasized that the goal of the UN Decade of Ocean Science for Sustainable Development revolves around the Societal Outcomes tied to Sustainable Development Goals. These are:

- (i) A Clean Ocean - sources of pollution are identified and reduced or removed.

- (ii) A Healthy and Resilient Ocean - Marine ecosystems are understood, protected, restored, and managed.
- (iii) A Productive Ocean, Supporting sustainable food supply and a sustainable ocean economy.
- (iv) A Predicted Ocean - Society understands and can respond to changing ocean conditions.
- (v) A Safe Ocean - life and livelihoods are protected from ocean-related hazards.
- (vi) An Accessible Ocean - open and equitable access to data information, technology, and innovation.
- (vii) An Inspiring and Engaging Ocean - Society understands and values the diverse roles and different value systems of the Ocean concerning human well-being and sustainable development.

The Meeting noted the Decade Action Hierarchy as follows:

1. Decade Programme

- Global and regional in scale.
- To fulfil one or more of the Decade Objectives.
- It is long term (multi-year), interdisciplinary and typically multi-national.

Dr Kong disclosed that the outcome of the 14th Session of TOWS-WG endorsed a Tsunami Programme under the UN Ocean Decade on Sustainable Development. It is an outreach technical outreach programme that is inter-disciplinary with a preparedness component. There would be individual projects within the programme.

2. Decade Project

- Discrete and focused undertaking of a shorter duration.
- It may stand alone but preferably aligned to an identified Decade programme.

3. Decade Activity

- This should be in support of an outcome, objective, programme, or project.
- Typically, a one-off stand-alone activity.
- It can form part of a programme or project or can relate directly to the Decade objective.

4. Decade Contribution

- Supports the Decade through the provision of required resources.
- A contribution can support the implementation of Decade Action or for coordination costs and be in-kind or financial.

The Meeting clarified that currently they are at the stage of identifying and endorsing programmes.

The meeting noted that the Joint World Meteorological Organization (WMO)-IOC Collaborative Board (JCB) used to be formerly known as Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM). Mr Aucan' sought clarification on when JCOMMS transitioned into JCB as a new body that deals with the atmosphere and oceans.

Dr Kong responded that a few years ago, WMO undertook an extensive effort to re-organize. During the re-organization, they identified subjects and categories were revised and re-named. Subsequently, JCOMMS was re-cast as JCB, with an interim chair.

ACTION: Dr Kong to share a presentation on the functions and activities of JCB with the Meeting and members of WG-PICT.

The Meeting noted the establishment of the Joint WMO-IOC Collaborative Board (JCB) based on the recommendations of the Joint WMO-IOC Consultation Group on the Reform of the WMO-IOC JCOMM, Congress 18, through Resolution 9 (Cg-18), and the 30th IOC Assembly through Resolution XXX-2.

UNESCO-IOC Tsunami Ready Programme and Recognition

It has agreed that the Tsunami Ready Guideline initially developed in the United States (US) in 2021, should now be adopted by IOC-UNESCO as a flagship for community resilience on Tsunami.

The Meeting noted that the Tsunami Early Warning Coordination comes under two societal outcomes:

- Predicted Ocean.
- Safe Ocean

It was pointed out that the community performance-based programme that facilitates Tsunami preparedness as an active collaboration of the public (community), community leaders, local and national emergency agencies and national Tsunami warning center (UNESCO-IOC Tsunami Ready Programme and Recognition), is aligned to the two societal outcomes:

- Predicted Ocean.
- Safe Ocean.

A community performance-based programme facilitates tsunami preparedness as an active collaboration of the public (community), community leaders, local and national emergency management agencies, and the national tsunami warning center. Such benefits include:

- Bringing the ownership of preparedness of the community
- Ensure a structural and systematic approach in building community preparedness supported by Science and Knowledge.
- A collaborative effort to meet a level of tsunami preparedness by fulfilling a set of established best practice guideline.

Mr David Coetzee informed the meeting of the recommendations of the 14th Session of TOWS-WG held online on February 25–26 2021. TOWS-WG had recommended that the Tsunami Programme should submit a proposal to the UN Decade of Ocean Sciences for Sustainable Development. An outcome is still pending.

The Group also recommended that the Draft 10–Year Research, Development, and Implementation Plan for the UN Decade Tsunami Programme (*the programme*) be dedicated to achieving transformational advances in tsunami detection, measurement, and forecasting, including tsunamis generated by non-seismic sources.

The meeting noted the recommendations of the 14th Session of TOWS-WG. They are:

That the programme should include the following focus areas related to tsunami warning capabilities:

- (i) Expansion of existing observational systems, including seismometers, coastal tide gauges, and deep ocean tsunami meters to fill identified gaps.
- (ii) Deploy new technologies to address observational gaps that cannot be covered by existing networks. This would include the widespread implementation of scientific instrumentation on deep-ocean telecommunication cables as developed by the ITU/WMO/UNESCO-IOC Joint Task Force (JFT) SMART Subsea Cables effort and submitted as a Programme to the UN Decade of Ocean Science for Sustainable Development.
- (iii) Wide expansion of data access and availability and development of capability for real-time sea level, seismic and GNSS-derived land motion data at an appropriate sampling rate and relevant tools to forecast tsunamis from all sources.
- (iv) Increase access and regularly update the collection of coastal topographic and bathymetric data, in collaboration with SEABED 2030, as well as high-performance computational capabilities to enable more timely, accurate and comprehensive Tsunami and other coastal hazard forecasts to advise community response better.
- (v) Ensure all National Tsunami Warning Centres have access to data, tools and communication platform, protocols, and training to timely and effectively warn coastal and maritime communities threatened by tsunamis and other coastal hazards and are integrated into a multi-hazard framework.

Other areas highlights were as follows:

The Group requested that the 31st IOC Assembly at its session in 2021 consider approving the establishment of the UN Decade Tsunami Programme.

The Scientific Committee to prepare the Draft 10–Year Research, Development, and Implementation Plan for this programme with Terms of Reference included in Appendix 1 and Annex II to the report of 14th Session of [IOC/TOWS-WG-XIV/3](#).

The Group recommended that the IOC Assembly at its session in 2021 encourage Member States to provide voluntary financial loans to IOC special accounts and in-kind contribution to support the UN Decade Tsunami Programme.

Dr Kong informed the meeting that the TOWS-WG recommendations would be tabled at the 31st IOC Assembly in June 2021 for final approval. Once approved, the Scientific Committee will prepare the draft 10-year Research, Development, and Implementation Plan.

Mr Aucan reiterated the TOWS-WG decision on SMART Subsea cables, and noted it has an excellent chance to be endorsed. Dr Kong disclosed that resources for Tsunami programmes had been limited over the years.

She stated that a UN Decade banner, especially for Tsunami Readiness, can bind everyone together as one region, both small and large communities, unlock donor support and the funding needed to target 100% coastal communities. She added that bathymetry and data sharing is equally important.

Mr Yuelong Mao thanked Dr Laura Kong for the presentation and highlighted the potential of the UN Decade Tsunami Programme to transform Tsunami early warning. UN Decade helps to focus on oceans and sustainable development.

It was agreed the UN Decade Tsunami Programme could get more people on board and amass partnership including non-traditional partners such as economists, media, and investors, allow gaps to be filled as well as align efforts. A good advocacy approach would be required. For example, it would take 800 years for one ship to survey the world ocean. How many years would it take 800 boats to survey the world ocean?

Dr Kong highlighted that more than 650 million people worldwide live along the coastline less than 10 meters above sea level.

Advocacy is required to attract funding support as well as greater efforts to reduce the impact of exposure of coastal dwellers to tsunami risks through preparedness and mitigation measures.

Mr Mathew Moihoi of PNG sought clarification from the meeting on the possibility of a brief to be provided on JCB to allow geo-hazards scientific and technical personal to align priorities.

Ms Esline Garaebiti highlighted that bathymetric data is an issue for proper modelling of tsunami inundation in SIDS.

She sought clarification on how the different priorities of Pacific SIDS are harmonized into the Decade Programme on Tsunami and supported by the UN Decade Submission.

Dr Kong informed the meeting that no new funding has been committed. The meeting noted that it is up to Member States to make the need for funding support known to donors and development partners. Other Decade Societal outcomes would equally be instrumental in getting funding support. It was agreed that the goal of the Tsunami Ready Programme and Recognition) is well defined and aligned the required needs and actions. In particular, the Tsunami Ready Programme advantage is that it is very much a people project, hence, its big attraction for Humanitarian Foundations.

Mr Aucan pointed out that the UN Oceans Decade Unit would coordinate donors to provide funding support. UNESCO-IOC does not fund many activities or provide money directly. The UN Oceans Decade would serve as a stamp of approval and legitimacy of Programmes endorsed by the Decade.

The Decade does not have direct access to funds; however, it can recommend Programmes and Projects to potential Donors. Technically, there will be funding through the Decade but not directly from the Decade. For example, when UNESCO-IOC approves a programme, it can easily be translated that 150 governments provided approval. The UN Decade is a legitimacy process with credibility and facilitates access to funding support.

5. COLLABORATION WITH OTHER BODIES

Mr Aucan highlighted the regional bodies identified in the Seventh WG-PICT meeting. Although CPPT is not on the list, they are encouraged to share their expertise with other WG-PICT Member States.

The central regional bodies that collaborate with WG-PICT are as follows:

- Pacific Meteorological Council
- Pacific Disaster Managers

- Pacific Resilience Partnership

The Meeting also discussed and noted the list of current and prospective partner agencies collaborating with WG-PICT.

Mr Jiuta Korovulavula highlighted the outcome of the 2020 Regional Disasters Managers Meeting on the new EU (European Union) funding envelope for the Southwest Pacific. SPC will coordinate sixty per cent, and the WMO CREWS project will administer forty per cent focused on multi-hazard early warning systems

Ms Eslie Garaebiti highlighted that in Vanuatu, NGOs (non-government organizations) and other government departments support Tsunami Ready. There is need to encourage PPP (Public-Private Partnerships) to support national Tsunami Ready Programmes.

The Meeting noted the inclusion of Emergency Management partners through the Regional Disaster Managers Partnership. Each Member States should send in their list of partner agencies.

6. PRIORITIES AND FUTURE ACTION PLAN & ELECTION OF WG-PICT OFFICERS

6.1. PTWS POST-EVENT DEBRIEF AND HOT WASH FOR 4 MARCH 2021 KERMADEC ISLAND EARTHQUAKE

The Meeting noted the PTWS Post-event and Hot Wash for 4 March 2021, on Kermadec island undersea earthquake report presented by Dr Kong.

She highlighted preliminary issues of the Hot Wash/debrief drawing from the findings of the Hot Wash/debrief. They include:

- A debrief and not Hot Wash.
- Whether you want to do a True PTWS Hot Wash.
- Whether there was too much time.
- Two debriefs, especially if it is a good event.

The Meeting noted guidance sought by Dr Laura's on how we improve Hot Wash, including:

- Templates and consistencies,
- Customized Hot Wash format for each region, and
- Divide sessions into two sessions, one for technical and one for response participants.

The Meeting emphasized that it is essential for emergency managers and scientists to be involved in discussions and prioritize them.

The Meeting recognized that the Hot Wash/debrief meeting invitations need to be improved as invitations are only made to TNCs and TWFPs.

The Meeting noted that the PICT summary was not fully covered.

The Meeting recognized that more time could be allocated to question-and-answer sessions.

The Meeting noted the importance of Hot Wash/debrief to gather different responses and sharing of observations.

Dr Kong highlighted PTWC's intent to know NTWC updates during the event. A system to provide feedback to PTWC is lacking as communication is in broadcast mode. Feedback is required and needs to be addressed by TSPs during or after the event.

The Meeting noted that PTWC took out countries from the PTWC messages due to feedback from social media that they had cancelled the national tsunami warning.

Mr Aucan explained that PTWC issued threat messages and not warnings and recommended that feedback be organized through TNC, TWFP and NTWC.

Mr David Coetze highlighted that the online debrief method is not conducive and noted the usefulness of the structure of the Hot Wash/Debrief in identifying lessons and areas of improvement. Importantly, the online debrief method does not indicate who has control or access and who is keen to share relevant information. "How can we overcome that? How do we deal with smaller events?"

He stated that providing feedback to PTWC is not feasible nor advisable. Dr Kong highlighted that PTWC feedback is currently ad hoc and may take time to be more organized.

Mr Yuelong Mao highlighted the conflict between domestic and international Tsunami warning products. He suggested that PTWC could also remove Tsunami watch and warning and only include assessment. Also, he acknowledged the significant effort of the PTWS and asked whether PTWC had considered more accurate modelling.

Dr Kong highlighted that Japan, Australia, New Caledonia, and Chile undertook their modelling and noted the US Rift model should be shared, noting that Chile had requested a more forecast zone. There was a question on how to undertake an "ensemble forecast"?

Mr Coetze proposed that the Meeting should request ICG/PTWS to provide a template for conducting a Hot Wash and De-brief.

The Meeting noted the following way forward on Post Event Hot Wash/ Debrief:

- Review the Hot Wash/Debrief and survey applicability and guidelines
- Development of Hot Wash/Debrief templates
- Format/ Structure for national and regional Hot Wash/Debrief
- More online seminar on forecasting is needed to minimize confusion.

The Meeting noted that countries should be encouraged to debrief following each event. Shared learning and experiences of the countries within PTWC jurisdiction are critical to identifying what is vital following each event.

6.2. ELECTION OF WG-PICT OFFICERS

The Meeting noted that Mr Aucan could no longer be a delegate of New Caledonia due to his new official appointment at SPC.

The Meeting nominated and elected the following new officers: Ms Eslie Garaebiti (Vanuatu) as Chair and Mr Mathew Moihoi (PNG) as Vice-Chair of WG-PICT.

7. REVIEW OF WG-PICT TERMS OF REFERENCE

The Meeting updated the Terms of Reference as outlined below:

- (i) To continually review and evaluate capabilities of, 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 within the multi-hazard framework.
- (ii) To support the involvement and contribution of PICT in the activities of the ICG/PTWS.
- (iii) To promote and facilitate the tsunami hazard and risk studies in the PICT region.
- (iv) To facilitate cooperation in the establishment and upgrading of earthquake and tsunami monitoring networks in the region and the interoperability of these systems in accordance with ICG/PTWS requirements.
- (v) To facilitate training and capacity building in the end-to-end tsunami warning and mitigation system in the region.
- (vi) To encourage the sharing of tsunami information, including but not limited to the free and open exchange of data.
- (vii) To facilitate tsunami awareness in school curricula, and development and dissemination of public educational materials
- (viii) To 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. Support the implementation of Tsunami priorities under the UN Decade.

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

8. RECOMMENDATIONS TO THE 29TH SESSION OF ICG/PTWS

The Meeting recognized the following recommendations of the WG-PICT to the 29th Session of the ICG/PTWS:

- **Continue** the WG-PICT with updated TOR and newly elected office bearers.
- **Continue** WG-PICT Task Team Capacity Development with updated TOR and recommendations.
- **Recognize** and Support WG 2 Task Team Seismic Data Sharing in Southwest Pacific recommendations.
- **Ensure** support towards ORSNET continuing operations.
- **Continuous** bilateral and multilateral support for Tsunami Ready Programme, TEMPP and MHEW through Development Partners and Donors.
- **Encourage** SPC to seek additional funding for improved coastal bathymetry acquisition (LIDAR) and build regional resources for modelling and support toward TEMPP.
- **Encourage** the ICG/PTWS to develop a template to conduct Hot Wash/Debrief after a significant event efficiently.
- **Consider** ITIC to be a member of WG-PICT.

- **Encourage** in-country collaboration (private and public partnership) for building tsunami community resiliency.

9. NEXT MEETING

The Meeting recognized the need to organize the WG-PICT Meeting following the ORNEST and PMC PIMOS Panel Meeting. Ms Eslie Garaebiti highlighted that ORSNET supports Member States travel to attend ORSNET Meetings. In 2017, PICT-WG Meeting was held following the ORSNET and PMC Meetings.

Dr Laura Kong highlighted that since Disaster Managers lead Tsunami Ready, it would be ideal to organize the WG-PICT Meeting following the SPC Pacific Disasters Managers Meeting.

Dr Laura Kong highlighted for WG-PICT to hold a Regional Meeting with everyone to support regional UN Decade Activities – to bring everyone together for a specific focus and outcome.

The Meeting recognized the need to organize the WG-PICT Meeting following the Pacific Disaster Managers Meeting or Pacific Resilience Partnership (PRP) Meeting.

10. CLOSURE OF MEETING

Mr Mathew Moihoi congratulated Mr Jérôme Aucan on his new official appointment at SPC.

Mr Jérôme Aucan highlighted that PCOSS is the reporting body for the UN Decade at SPC.

Mr Jérôme Aucan thanked national delegates and Permanent observers for attending the Meeting and encouraged them to support the delegates and Permanent Observers to work together in this intersessional period.

ANNEX I

AGENDA

- 3 EIGHTH MEETING OF THE PTWS REGIONAL WORKING GROUP ON TSUNAMI WARNING AND MITIGATION FOR PACIFIC ISLAND COUNTRIES AND TERRITORIES (PICTS) SESSION 1: 22:00-24:00 UTC ON 31ST MARCH 2021, SESSION 2: 2:00-4:00 UTC ON 1ST APRIL 2021
- 3.1 WELCOME AND OPENING Chair PICT-WG Jérôme Aucan (2 minutes)
- 3.2 REVIEW OF OUTCOME OF SEVENTH MEETING OF PICT-WG (10 mins)
 - 3.2.1 UPDATE FROM 28th ICG/PTWS MEETING (Ofa Fa'anunu) (5 mins)
 - 3.2.2 UPDATE FROM ICG/PTWS SC MEETING (Jérôme Aucan) (5mins)
- 3.3 REVIEW OF TSUNAMI DETECTION, WARNING, AND RESPONSE AND TSUNAMI MITIGATION IN THE REGION (40 mins)
 - 3.3.1 REPORT FROM PTWS TASK TEAM ON SEISMIC DATA SHARING IN SW PACIFIC (Rennie Vaiomounga) (20 mins)
 - 3.3.2 REPORT FROM TASK TEAM CAPACITY DEVELOPMENT IN SW PACIFIC (Ofa Fa'anunu) (20 mins)
- 3.4 ZOOM GROUP PHOTO (2mins)
- 3.5 UN DECADE FOR OCEANS AND SUSTAINABLE DEVELOPMENT (10mins)
- 3.6 COLLABORATION WITH OTHER BODIES (10 mins)
- 3.7 DISCUSSION ON WG PRIORTIES AND FUTURE ACTION PLAN (10 mins)
 - 3.7.1 PTWS Debrief/Hotwash Of 4 March 2021 Meeting Feedback
- 3.8 REVIEW OF WG TOR (10 mins)
- 3.9 RECOMMENDATION to 29TH ICG/PTWS SESSION (20mins)
- 3.10 NEXT MEETING (2 mins)
- 3.11 CLOSURE OF MEETING (2mins)

ANNEX II

PROGRESS, DECISIONS AND RECOMMENDATIONS PACIFIC ISLANDS COUNTRIES (PICTs) AND TERRITORIES REGIONAL WORKING GROUP ON TSUNAMI WARNING AND MITIGATION & TASK TEAM ON CAPACITY DEVELOPMENT

(Draft Recommendations to be submitted to ICG/PTWS-XXIX)

Despite the current COVID-19 pandemic, WG-PICT and its Task Team on Capacity Development was able to meet once during the intersessional period, back to back with the online Sixth ORSNET meeting and Seventh Meeting of the PTWS WG2 Task Team Seismic Data Sharing in the Southwest Pacific on 29-30 March, 2021.

The decisions of the ICG/PTWS -XXVIII session on WG-PICT and its Task Team Capacity Development TOR guided efforts of Member States and development partners in this intersessional period.

1. PROGRESS SINCE THE 28TH SESSION OF THE ICG/PTWS

1.1 OCEANIA REGIONAL SEISMIC NETWORK (ORSNET) & TASK TEAM SEISMIC DATA SHARING IN SOUTHWEST PACIFIC

- Through the support of The Pacific Community (SPC) PREP Project ORSNET members states.
 - Completed a Basic SeisComp Training delivered by GemPa.
 - Reviewed ORSNET status with the support of two SPC consultants
- Upgrade of Seismic Stations in Fiji and Tonga
 - Fiji undergoing upgrade through Fiji government support
 - Tonga undergoing upgrade through World Bank PREP project support
- ORSNET data sharing agreement
 - Fiji signed ORSNET data sharing agreement.
- New Zealand DART Buoy Network
 - 4.3 Million government funded network
 - Currently provides monitoring and detection information for Tokelau, Niue, the Cook Islands, Tonga and Samoa.

1.2 CAPACITY DEVELOPMENT

- Through the support of The Pacific Community (SPC) WG-Capacity Development conducted the following training;
 - TEMPP1 Training
 - Basic SeisComp Training
- UNESCO/IOC Tsunami Ready Recognition Programme in progress in Fiji, Solomon Islands and Vanuatu

1.3 MULTI-HAZARD EARLY WARNING SYSTEM

- Palau and Fiji Tsunami Siren Network Project ongoing;
- UNDP Tsunami Preparedness Kits for Kiribati, Federated States of Micronesia, Tuvalu, Palau and Vanuatu;
- PacWAVE20 conducted where Tuvalu, Fiji and Vanuatu carried out Full Functional Exercise;

- 4th March Event HotWASH/Debrief conducted highlighting progress and challenges within NTWC; and
- Tsunami SOP and National Tsunami Response Plan reviewed and updated in Kiribati, Fiji, Vanuatu, Samoa and Solomon Islands.

2. RECOMMENDATIONS TO THE 29TH SESSION OF ICG/PTWS

The Meeting agreed on the following recommendations of the WG-PICT to the 29th Session of the ICG/PTWS:

- **Continue** the WG-PICT with updated TOR and newly elected office bearers.
- **Continue** WG-PICT Task Team Capacity Development with updated TOR and recommendations.
- **Recognize** and Support WG 2 Task Team Seismic Data Sharing in Southwest Pacific recommendations.
- **Ensure** support towards ORSNET continuing operations.
- **Continuous** bilateral and multilateral support for Tsunami Ready Programme, TEMPP and MHEW through Development Partners and Donors.
- **Encourage** SPC to seek additional funding for improved coastal bathymetry acquisition (LIDAR) and build regional resources for modelling and support toward TEMPP.
- **Encourage** the ICG/PTWS to develop a template to conduct Hot Wash/Debrief after a significant event efficiently.
- **Consider** ITIC to be a member of WG-PICT.
- **Encourage** in-country collaboration (private and public partnership) for building tsunami community resiliency.

WG-PICT Task Team Capacity Development Progress and Recommendations

The meeting was pleased to note the recommendations of the Task Team Capacity Development outlined below. It was agreed to re-establish the Task Team Capacity Development with the following Terms of Reference:

1. Continue the development of competency framework for National Tsunami Warning Centres personnel and pilot it in Vanuatu, Fiji, Samoa, and Tonga as well as report progress and lessons learnt to ICG/PTWS WG1, 2, and 3.
2. Continue to monitor and coordinate Pilot Tsunami Ready Recognition Pilot Program and TEMPP in Samoa, Tonga, Fiji, Cook Islands, Solomon Islands and Vanuatu and review the Tsunami Ready Checklist for PICT (Pacific Island Countries and Territory) schools and communities.
3. Continue to develop the guideline for National Tsunami Warning Centres in responding to local Tsunami and develop competency for warning personal and report to WG1, 2 and 3.
4. Develop an online survey of warning and mitigation capabilities in PICTs (Member countries and IOC).

The Task Team Members - Australia, New Caledonia (Co-chair), Tonga (Chair), Samoa, Vanuatu, New Zealand, Solomon Islands, Fiji, would:

- **Assess** the effectiveness of online training,
- **Identify** best practices to roll out Tsunami Ready Programme, e.g., working with partner agencies,
- **Request** regional partners to support bathymetric surveys and modelling, and
- **Encourage** countries to promote bathymetric data sharing among national and regional agencies.

WG2 Task Team Seismic Data Sharing in the Southwest Pacific Progress and Recommendations

The meeting was pleased to note the recommendations of the Task Team Seismic Data Sharing in the Southwest Pacific outlined below. It was agreed to re-establish the Task Team Seismic Data Sharing in the Southwest Pacific with the following Terms of Reference:

- Advocate seismic data sharing in the region,
- Advice Southwest Pacific countries on data sharing protocols, techniques, and technologies,
- Work with Southwest Pacific countries and donors to ensure a common data sharing policy, and
- Encourage Southwest Pacific Countries with existing or planned 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 provided by FDSN.

It was noted that members are representatives of South 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 the United States.

- **Promote** and support the recommendations of the Sixth Meeting of ORSNET Member State
- **Support** towards ORSNET continuing operations
- Recognized and supports the need to hold an Expert meeting on Tsunamigenic seismic data sources on the New Hebrides and New Britain trenches to strengthen tsunami modelling and inundation mapping in the Southwest Pacific.
- **Encourage** the alignment of seismic monitoring with the UN Decade of Oceans for Sustainable Development through the IOC Tsunami Programme, for visibility and funding opportunities.
- **Support** the deployment of the New Zealand government DART network through New Zealand Emergency Management Agency (NEMA) and GNS New Zealand
- **Nominated** Rennie VAIOMOUNGA from Tonga as Chair, Mathew MOIHOI from Papua New Guinea as Co-Chair and Pierre LEBELGARD and Sylvain TODMAN as ORSNET (Oceania Regional Seismic Network) technical adviser for the next intersessional period.

The progress of the Sixth meeting of ORSNET Member States and their 2021–2022 priorities. The priorities are:

- a. Upgrade the regional ORSNET server that is due for an upgrade.
- b. Continue the issue of earthquake bulletins notifications for tsunami warning systems as appropriate to members and Tsunami warning focal points for other PICs (Pacific Island Countries) upon request.
- c. Encouraged ORSNET Member States to expedite the signing of the ORSNET Regional Agreement document signed by Fiji.
- d. There are 33 out of 53 seismic stations that are currently operational, and Member States are encouraged to increase investment in maintenance and upgrade of existing stations and the installation of new seismic stations.
- e. Continue efforts in expanding data-sharing efforts with French Polynesia and the volcanic seismic monitoring observatories in the region such as Rabaul Volcano Observatory (RVO).
- f. Encourage Member States to collaborate with The Pacific Community (SPC) consultants to provide the information required to issue a technical report on ORSNET needs and plans. The report should be ready and submitted to the ORSNET secretariat by April 15th, 2021.

The meeting maintained the current ORSNET focal point of Member States, namely:

- Tonga – Mr Rennie VAIOMOUNGA,
- Papua New Guinea – Mr Mathew MOIHOI,
- Fiji- Mr Isikeli DUWAI,
- Vanuatu – Ms Esline GARAEBITI,
- Solomon Islands – Mr Kevin POROHOA,
- Samoa – Mr Lameko Talia,
- New Caledonia – Mr Pierre Lebellegard.

The meeting also proposed to have an alternate ORSNET focal point for Member States for redundancy purposes, namely:

- Tonga – Ms Yumi NAFE,
- Papua New Guinea – Mr Mikhail HERRY,
- Fiji – Mr Laisenia RAWACE,
- Vanuatu – Mr Dan TARI,
- Solomon Islands – Mr Jack BEN,
- Samoa – Mr Maleafatu LEAVASA, and
- New Caledonia – Mr YANNS

The meeting re-elected Ms Esline GARAEBITI from Vanuatu as the Chair, Mr Rennie VAIOMOUNGA from Tonga as the Vice-Chair and Mr Isikeli DUWAI from Fiji as the Secretary and Ms Katie POGI from Samoa as Vice-Secretary for the following year.

ANNEX III

Seventh Meeting of the PTWS Working Group 2 Task Team on Seismic Data Sharing in the Southwest Pacific and Eighth Meeting of the PTWS Regional Working Group on Tsunami Warning and Mitigation for Pacific Island Countries and Territories (PICTs), Paris, France, 29 March–1 April 2021

LIST OF PARTICIPANTS

Delegates

Mr David COETZEE
Manager, Regional Partnerships/ National
Controller
National Emergency Management Agency
Ministry of Civil Defence & Emergency
Management
PO Box 5010
Wellington 6145
New Zealand
Tel: +64 274421236

Mr 'Ofa FA'ANUNU
Director of Meteorological Service
Meteorological & Coast Radio Services
Domestic Terminal
Nuku'alofa Tonga

Mrs. Esline GARAEBITI
Geohazards Manager
Vanuatu Meteorology & Geohazards
Department, Private Mail Bag 9054
Port Vila Vanuatu
Tel: +678 24686

Dr Laura KONG
Director ITIC
UNESCO IOC NOAA International Tsunami
Information Center
1845 Wasp Blvd, Bldg 176
Honolulu Hawaii 96818 USA
United States of America
Tel: 1-808-725-6051
Fax: 1-808-725-6055

Mr Pierre LEBELLEGARD
Research engineer
UMR Géoazur (Seismology)
Institut de Recherche pour le

Développement, Centre de Nouméa
101 Promenade Roger Laroque
Nouméa Cedex 98848
New Caledonia
Tel: +687 964470

Mr Raymond MOHAMMED
Mineral Resources Department, Fiji
Private Mail Bag, GPO Suva.
Fiji

Mr Mathew MOIHOI
Seismologist
121 Port Moresby, National Capital District
Port Moresby National Capital District 121
Papua New Guinea
Tel: (675) 321 4634
Fax: (675) 321 3976

Ms Adrienne MOSELEY
Director, National Earthquake Alerts Centre,
Geoscience Australia
Cnr Jerrabomberra Ave and Hindmarsh
Drive
Canberra ACT 2609, Australia
Tel: +61 (0)2 6249 9604

Mr Arona NGARI
Director, Meteorological Service
P O Box 127, Avarua
Rarotonga, Cook Islands
Avarua Cook Islands
Tel: (682) 20603

Ms Katie POGI
Senior Scientific Officer
Meteorology Division
Ministry of Natural Resources and
Environment, Samoa
Tuiatua Tupua Tamasese Efi - Sogi Apia
Samoa

Stéphane QUEMA
Laboratoire de Géophysique, Commissariat
à l'Energie Atomique (CEA/DASE/LDG).
P.O. Box 640
Papeete Tahiti 98713
French Polynesia

Ms Sally RIMON
Secretariat of the Pacific Community (SPC)
Office of Te Beretenti, Kiribati (PM's Office)
P.O. Box 68, Bainki
Tarawa-Sud Kiribati

Ms Jewel TUITAMA
Ministry for Climate, Ocean and Resilience
P.O. Box 3298
Apia, SAMOA Tokelau

Members of Delegation

Mr Peni KUBOUTAWA
Fiji National Disaster Management Office
1 Regional House
Knolly Street
Suva Fiji

Mr Edward MARU
Department of Communications, Aviation
and Meteorology
P.O. Box 21
Honiara Solomon Islands

Mr Simon ALLEN
Bureau of Meteorology, Melbourne
700 Collins Street, Docklands
GPO Box 1289
Melbourne VIC 3001
Australia
Jack BEN
Ministry for Mines, Energy and Rural
Electrification
P.O. Box G37
Honiara Solomon Islands

Dr Bill FRY
Scientist
Tectonophysics
GNS Science
P.O. Box 30-368
1 Fairway Drive

Avalon Lower Hutt 5040 5010
New Zealand

Mr Vailoa IEFATA
Scientific Officer- Geo-Science
Geoscience
Meteorology Division, Samoa
Mulinuu Samoa, BO. Box 4020

Beach Road, Tate Building, Level 3
Apia Samoa 95564
Samoa
Tel: 20996

Ms Ima ITIKARAI
Rabaul Volcano Observatory-Department of
Mineral Policy & Geohazards Management
P O Box 323
Rabaul Papua New Guinea

Mr Sakaraia V MALODALI
Mineral Resources Department, Fiji
Private Mail Bag, GPO
Suva Suva Fiji

Ms Mele MANU
Natural Resources Division
Ministry of Lands and Natural Resources
Vaololoa
Nuku'alofa P.O Box 5
Tonga

Dr Yuelong MIAO
Manager for Tsunami and Storm Surge
Environmental Prediction Services
Bureau of Meteorology, Melbourne
700 Collins Street, Docklands
Melbourne VIC 3001
Australia
Tel: +61 3 9669 4110

Ms Yumi NAFE
Assistant Geologist
Natural Resources Division
Ministry of Lands and Natural Resources
Vaololoa
Nuku'alofa P.O Box 5
Tonga
Tel: +6767703047

Mr Bernard PELLETIER
Institut de Recherche pour le
Développement, Centre de Nouméa
101 Promenade Roger Laroque
B.P. A5
Nouméa Cedex 98848
New Caledonia

Mr Laisenia RAWACE
Seismology Unit
Mineral Resources Department, Fiji
Private Mail Bag, GPO
Suva Fiji

Mr Alexander RILIFIA
Weather Forecaster
National Weather Office
Department of Communications, Aviation
and Meteorology
P.O. Box 21
Honiara Solomon Islands
Tel: +677 27658

Dan TARI
Vanuatu Meteorology & Geohazards
Department
Private Mail Bag 9054
Port Vila Vanuatu

Mr Rennie VAIOMOUNGA
Natural Resources Division
Ministry of Information and Communications
- Lands, Survey & Natural Resources
P.O. Box 5
Nuku'alofa Tonga

Mr Isikeli WAISEGA DUWAI
Mineral Resources Department, Fiji
Private Mail Bag, GPO
Suva Suva Fiji

Permanent Observers

Dr Jérôme AUCAN
Researcher
Pacific Community Center for Ocean
Science (PCCOS)
Pacific Community
95 Promenade Roger Laroque
Nouméa Cedex 98848
New Caledonia

Secretariat

Mr Bernardo ALIAGA ROSSEL
Programme Specialist
Intergovernmental Oceanographic
Commission of UNESCO
7, place de Fontenoy
Paris cedex 07 75732
France
Tel: +33 1 45 68 03 17

Mr Jiuta KOROVLAVULA
Tsunami Unit
Intergovernmental Oceanographic
Commission of UNESCO
7, place de Fontenoy
Paris cedex 07 75732 France
France

Observers

Ms Molly POWERS
Team Leader, Ocean Literacy and Maritime
Capacity
Oceans & Maritime Programme
Secretariat of the Pacific Community -
Regional Office
Ratu Mara Road
Suva Fiji
Tel: +6798629655

ANNEX IV

LIST OF ACRONYMS

CREWS	Climate Risk & Early Warning Systems
CROP	Council of Regional Organizations in the Pacific
DART	Deep-ocean Assessment and Reporting of Tsunamis Project
EU	European Union
FDSN	International Federation of Digital Seismograph Networks
ICG	Intergovernmental Coordination Group (IOC-UNESCO)
ICG/PTWS	Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (IOC-UNESCO)
IOC	Intergovernmental Oceanographic Commission (UNESCO)
IOTIC	Indian Ocean Tsunami Information Centre
ITIC	International Tsunami Information Center
ITU	International Telecommunication Union
JCB	Joint WMO-IOC Collaborative Board
JCOMM	Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
JFT	Joint Task Force
LIDAR	Light Detection and Ranging (remote sensing method)
MHEWS	Multi Hazard Early Warning System
NGO	Non-Government Organization
NWPTAC	Northwest Pacific Tsunami Advisory Centre
NZ	New Zealand
NEMA	New Zealand Emergency Management Agency
ORSNET	Oceania Regional Seismic Network
OTGA	Ocean Teacher Global Academy
PacWAVE20	Exercise Pacific Wave 2020
PICT	Pacific Island Countries and Territories
PMC	Pacific Meteorological Council
PIMOS	Pacific Islands Marine and Ocean Services

PNG	Papua New Guinea
PPP	Public-Private Partnership
PRP	Pacific Resilience Partnership
PTWC	Pacific Tsunami Warning Center
PTWS	Pacific Tsunami Warning and Mitigation System (IOC-UNESCO)
RVO	Rabaul Volcano Observatory
SC	Steering Committee
SIDS	Small Island Developing State
SOP	Standard Operating Procedure
SPC	The Pacific Community
TEMPP	Tsunami Evacuation Mapping, Plans and Procedures
TOR	Terms of Reference
TOWS-WG	Working Group on Tsunamis and other Hazard related to Sea-level Warning and Mitigation Systems (IOC-UNESCO)
US	United States
UN	United Nations
WG	Working Group
WMO	World Meteorological Organization
WTAD	World Tsunami Awareness Day (5 November)

In this Series, entitled

Reports of Meetings of Experts and Equivalent Bodies, which was initiated in 1984 and which is published in English only, unless otherwise specified, the reports of the following meetings have already been issued:

1. Third Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans
2. Fourth Meeting of the Central Editorial Board for the Geological/Geophysical Atlases of the Atlantic and Pacific Oceans S. Fourth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' (**Also printed in Spanish**)
4. First Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
5. First Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources
6. First Session of the Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
7. First Session of the Joint CCOP(SOPAC)-IOC Working Group on South Pacific Tectonics and Resources
8. First Session of the IODE Group of Experts on Marine Information Management
9. Tenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies in East Asian Tectonics and Resources
10. Sixth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
11. First Session of the IOC Consultative Group on Ocean Mapping (**Also printed in French and Spanish**)
12. Joint 100-WMO Meeting for Implementation of IGOSS XBT Ships-of-Opportunity Programmes
13. Second Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
14. Third Session of the Group of Experts on Format Development
15. Eleventh Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
16. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
17. Seventh Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
18. Second Session of the IOC Group of Experts on Effects of Pollutants
19. Primera Reunión del Comité Editorial de la COI para la Carta Batimétrica Internacional del Mar Caribe y Parte del Océano Pacífico frente a Centroamérica (**Spanish only**)
20. Third Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
21. Twelfth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of South-East Asian Tectonics and Resources
22. Second Session of the IODE Group of Experts on Marine Information Management
23. First Session of the IOC Group of Experts on Marine Geology and Geophysics in the Western Pacific
24. Second Session of the IOC-UN(OETB) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources (**Also printed in French and Spanish**)
25. Third Session of the IOC Group of Experts on Effects of Pollutants
26. Eighth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
27. Eleventh Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (**Also printed in French**)
28. Second Session of the IOC-FAO Guiding Group of Experts on the Programme of Ocean Science in Relation to Living Resources
29. First Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
30. First Session of the IOCARIBE Group of Experts on Recruitment in Tropical Coastal Demersal Communities (**Also printed in Spanish**)
31. Second IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
32. Thirteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asia Tectonics and Resources
33. Second Session of the IOC Task Team on the Global Sea-Level Observing System
34. Third Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and Overlay Sheets
35. Fourth Session of the IOC-UNEP-IMO Group of Experts on Effects of Pollutants
36. First Consultative Meeting on RNODCs and Climate Data Services
37. Second Joint IOC-WMO Meeting of Experts on IGOSS-IODE Data Flow
38. Fourth Session of the Joint CCOP/SOPAC-IOC Working Group on South Pacific Tectonics and Resources
39. Fourth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
40. Fourteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asian Tectonics and Resources
41. Third Session of the IOC Consultative Group on Ocean Mapping
42. Sixth Session of the Joint IOC-WMO-CCPS Working Group on the Investigations of 'El Niño' (**Also printed in Spanish**)
43. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
44. Third Session of the IOC-UN(OALOS) Guiding Group of Experts on the Programme of Ocean Science in Relation to Non-Living Resources
45. Ninth Session of the IOC-UNEP Group of Experts on Methods, Standards and Intercalibration
46. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
47. Cancelled
48. Twelfth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans
49. Fifteenth Session of the Joint CCOP-IOC Working Group on Post-IDOE Studies of East Asian Tectonics and Resources
50. Third Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
51. First Session of the IOC Group of Experts on the Global Sea-Level Observing System
52. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean
53. First Session of the IOC Editorial Board for the International Chart of the Central Eastern Atlantic (**Also printed in French**)
54. Third Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (**Also printed in Spanish**)
55. Fifth Session of the IOC-UNEP-IMO Group of Experts on Effects of Pollutants
56. Second Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean
57. First Meeting of the IOC *ad hoc* Group of Experts on Ocean Mapping in the WESTPAC Area
58. Fourth Session of the IOC Consultative Group on Ocean Mapping
59. Second Session of the IOC-WMO/IGOSS Group of Experts on Operations and Technical Applications
60. Second Session of the IOC Group of Experts on the Global Sea-Level Observing System

61. UNEP-IOC-WMO Meeting of Experts on Long-Term Global Monitoring System of Coastal and Near-Shore Phenomena Related to Climate Change
62. Third Session of the IOC-FAO Group of Experts on the Programme of Ocean Science in Relation to Living Resources
63. Second Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
64. Joint Meeting of the Group of Experts on Pollutants and the Group of Experts on Methods, Standards and Intercalibration
65. First Meeting of the Working Group on Oceanographic Co-operation in the ROPME Sea Area
66. Fifth Session of the Editorial Board for the International Bathymetric and its Geological/Geophysical Series
67. Thirteenth Session of the IOC-IHO Joint Guiding Committee for the General Bathymetric Chart of the Oceans (**Also printed in French**)
68. International Meeting of Scientific and Technical Experts on Climate Change and Oceans
69. UNEP-IOC-WMO-IUCN Meeting of Experts on a Long-Term Global Monitoring System
70. Fourth Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
71. ROPME-IOC Meeting of the Steering Committee on Oceanographic Co-operation in the ROPME Sea Area
72. Seventh Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño' (**Spanish only**)
73. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (**Also printed in Spanish**)
74. UNEP-IOC-ASPEI Global Task Team on the Implications of Climate Change on Coral Reefs
75. Third Session of the IODE Group of Experts on Marine Information Management
76. Fifth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
77. ROPME-IOC Meeting of the Steering Committee for the Integrated Project Plan for the Coastal and Marine Environment of the ROPME Sea Area
78. Third Session of the IOC Group of Experts on the Global Sea-level Observing System
79. Third Session of the IOC-IAEA-UNEP Group of Experts on Standards and Reference Materials
80. Fourteenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans
81. Fifth Joint IOG-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
82. Second Meeting of the UNEP-IOC-ASPEI Global Task Team on the Implications of climate Change on Coral Reefs
83. Seventh Session of the JSC Ocean Observing System Development Panel
84. Fourth Session of the IODE Group of Experts on Marine Information Management
85. Sixth Session of the IOC Editorial Board for the International Bathymetric chart of the Mediterranean and its Geological/Geophysical Series
86. Fourth Session of the Joint IOC-JGOFS Panel on Carbon Dioxide
87. First Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Pacific
88. Eighth Session of the JSC Ocean Observing System Development Panel
89. Ninth Session of the JSC Ocean Observing System Development Panel
90. Sixth Session of the IODE Group of Experts on Technical Aspects of Data Exchange
91. First Session of the IOC-FAO Group of Experts on OSLR for the IOCINCWIO Region
92. Fifth Session of the Joint IOC-JGOFS CO₂ Advisory Panel Meeting
93. Tenth Session of the JSC Ocean Observing System Development Panel
94. First Session of the Joint CMM-IGOSS-IODE Sub-group on Ocean Satellites and Remote Sensing
95. Third Session of the IOC Editorial Board for the International Chart of the Western Indian Ocean
96. Fourth Session of the IOC Group of Experts on the Global Sea Level Observing System
97. Joint Meeting of GEMSI and GEEP Core Groups
98. First Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
99. Second International Meeting of Scientific and Technical Experts on Climate Change and the Oceans
100. First Meeting of the Officers of the Editorial Board for the International Bathymetric Chart of the Western Pacific
101. Fifth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico
102. Second Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
103. Fifteenth Session of the Joint IOC-IHO Committee for the General Bathymetric Chart of the Oceans
104. Fifth Session of the IOC Consultative Group on Ocean Mapping
105. Fifth Session of the IODE Group of Experts on Marine Information Management
106. IOC-NOAA *Ad hoc* Consultation on Marine Biodiversity
107. Sixth Joint IOC-WMO Meeting for Implementation of IGOSS XBT Ship-of-Opportunity Programmes
108. Third Session of the Health of the Oceans (HOTO) Panel of the Joint Scientific and Technical Committee for GLOSS
109. Second Session of the Strategy Subcommittee (SSC) of the IOC-WMO-UNEP Intergovernmental Committee for the Global Ocean Observing System
110. Third Session of the Joint Scientific and Technical Committee for Global Ocean Observing System
111. First Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate
112. Sixth Session of the Joint IOC-JGOFS CO₂ Advisory Panel Meeting
113. First Meeting of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS)
114. Eighth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of "El Niño" (**Spanish only**)
115. Second Session of the IOC Editorial Board of the International Bathymetric Chart of the Central Eastern Atlantic (**Also printed in French**)
116. Tenth Session of the Officers Committee for the Joint IOC-IHO General Bathymetric Chart of the Oceans (GEBCO), USA, 1996
117. IOC Group of Experts on the Global Sea Level Observing System (GLOSS), Fifth Session, USA, 1997
118. Joint Scientific Technical Committee for Global Ocean Observing System (J-GOOS), Fourth Session, USA, 1997
119. First Session of the Joint 100-WMO IGOSS Ship-of-Opportunity Programme Implementation Panel, South Africa, 1997
120. Report of Ocean Climate Time-Series Workshop, Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate, USA, 1997
121. IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional Global Ocean Observing System (NEAR-GOOS), Second Session, Thailand, 1997
122. First Session of the IOC-IUCN-NOAA *Ad hoc* Consultative Meeting on Large Marine Ecosystems (LME), France, 1997

123. Second Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), South Africa, 1997
124. Sixth Session of the IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico, Colombia, 1996 **(also printed in Spanish)**
125. Seventh Session of the IODE Group of Experts on Technical Aspects of Data Exchange, Ireland, 1997
126. IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), First Session, France, 1997
127. Second Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LME), France, 1998
128. Sixth Session of the IOC Consultative Group on Ocean Mapping (CGOM), Monaco, 1997
129. Sixth Session of the Tropical Atmosphere - Ocean Array (TAO) Implementation Panel, United Kingdom, 1997
130. First Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), France, 1998
131. Fourth Session of the Health of the Oceans (HOTO) Panel of the Global Ocean Observing System (GOOS), Singapore, 1997
132. Sixteenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO), United Kingdom, 1997
133. First Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), France, 1998
134. Fourth Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IOC/EB-IBCWIO-IW3), South Africa, 1997
135. Third Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), France, 1998
136. Seventh Session of the Joint IOC-JGOFS C02 Advisory Panel Meeting, Germany, 1997
137. Implementation of Global Ocean Observations for GOOS/GCOS, First Session, Australia, 1998
138. Implementation of Global Ocean Observations for GOOS/GCOS, Second Session, France, 1998
139. Second Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Brazil, 1998
140. Third Session of IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS), China, 1998
141. Ninth Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño', Ecuador, 1998 **(Spanish only)**
142. Seventh Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series, Croatia, 1998
143. Seventh Session of the Tropical Atmosphere-Ocean Array (TAO) Implementation Panel, Abidjan, Côte d'Ivoire, 1998
144. Sixth Session of the IODE Group of Experts on Marine Information Management (GEMIM), USA, 1999
145. Second Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), China, 1999
146. Third Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Ghana, 1999
147. Fourth Session of the GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC); Fourth Session of the WCRP CLIVAR Upper Ocean Panel (UOP); Special Joint Session of OOPC and UOP, USA, 1999
148. Second Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), France, 1999
149. Eighth Session of the Joint IOC-JGOFS CO2 Advisory Panel Meeting, Japan, 1999
150. Fourth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), Japan, 1999
151. Seventh Session of the IOC Consultative Group on Ocean Mapping (CGOM), Monaco, 1999
152. Sixth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), France, 1999
153. Seventeenth Session of the Joint IOC-IHO Guiding Committee for the General Bathymetric Chart of the Oceans (GEBCO), Canada, 1999
154. Comité Editorial de la COI para la Carta Batimétrica Internacional del Mar Caribe y el Golfo de Mexico (IBCCA), Septima Reunión, Mexico, 1998
IOC Editorial Board for the International Bathymetric Chart of the Caribbean Sea and the Gulf of Mexico (IBCCA), Seventh Session, Mexico, 1998
155. Initial Global Ocean Observing System (GOOS) Commitments Meeting, IOC-WMO-UNEP-ICSU/Impl-III/3, France, 1999
156. First Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, Venezuela, 1999 **(also printed in Spanish and French)**
157. Fourth Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), China, 1999
158. Eighth Session of the IOC Editorial Board for the International Bathymetric Chart of the Mediterranean and its Geological/Geophysical Series, Russian Federation, 1999
159. Third Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS), Chile, 1999
160. Fourth Session of the IOC-WMO-UNEP-ICSU-FAO Living Marine Resources Panel of the Global Ocean Observing System (GOOS). Hawaii, 2000
161. Eighth Session of the IODE Group of Experts on Technical Aspects of Data Exchange, USA, 2000
162. Third Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LME), France, 2000
163. Fifth Session of the IOC-WMO-UNEP-ICSU Coastal Panel of the Global Ocean Observing System (GOOS), Poland, 2000
164. Third Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System (GOOS), France, 2000
165. Second Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, Cuba, 2000 **(also printed in Spanish and French)**
166. First Session of the Coastal Ocean Observations Panel, Costa Rica, 2000
167. First GOOS Users' Forum, 2000
168. Seventh Session of the Group of Experts on the Global Sea Level Observing System, Honolulu, 2001
169. First Session of the Advisory Body of Experts on the Law of the Sea (ABE-LOS), France, 2001 **(also printed in French)**
170. Fourth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, Chile, 2001
171. First Session of the IOC-SCOR Ocean CO₂ Advisory Panel, France, 2000
172. Fifth Session of the GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), Norway, 2000 **(electronic copy only)**
173. Third Session of the *ad hoc* Advisory Group for IOCARIBE-GOOS, USA, 2001 **(also printed in Spanish and French)**
174. Second Session of the Coastal Ocean Observations Panel and GOOS Users' Forum, Italy, 2001
175. Second Session of the Black Sea GOOS Workshop, Georgia, 2001
176. Fifth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), Republic of Korea, 2000
177. Second Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Morocco, 2002 **(also printed in French)**
178. Sixth Session of the Joint GCOS-GOOS-WCRP Ocean Observations Panel for Climate (OOPC), Australia, 2001 **(electronic copy only)**
179. *Cancelled*
180. Second Session of the IOC-SCOR Ocean CO₂ Advisory Panel, Honolulu, Hawaii, U.S.A., 2002 **(electronic copy only)**

181. IOC Workshop on the Establishment of SEAGOOS in the Wider Southeast Asian Region, Seoul, Republic of Korea, 2001 (SEAGOOS preparatory workshop) **(electronic copy only)**
182. First Session of the IODE Steering Group for the Resource Kit, USA, 19–21 March 2001
183. Fourth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), France, 2002
184. Seventh Session of the IODE Group of Experts on Marine Information Management (GEMIM), France, 2002 **(electronic copy only)**
185. Sixth Session of IOC/WESTPAC Coordinating Committee for the North-East Asian Regional - Global Ocean Observing System (NEAR-GOOS), Republic of Korea, 2001 **(electronic copy only)**
186. First Session of the Global Ocean Observing System (GOOS) Capacity Building Panel, Switzerland, 2002 **(electronic copy only)**
187. Fourth Session of the ad hoc Advisory Group for IOCARIBE-GOOS, 2002, Mexico **(also printed in French and Spanish)**
188. Fifth Session of the IOC Editorial Board for the International Bathymetric Chart of the Western Indian Ocean (IBCWIO), Mauritius, 2000
189. Third session of the Editorial Board for the International Bathymetric Chart of the Western Pacific, China, 2000
190. Third Session of the Coastal Ocean Observations Panel and GOOS Users' Forum, Vietnam, 2002
191. Eighth Session of the IOC Consultative Group on Ocean Mapping, Russian Federation, 2001
192. Third Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Lisbon, 2003 **(also printed in French)**
193. Extraordinary Session of the Joint IOC-WMO-CPPS Working Group on the Investigations of 'El Niño', Chile, 1999 **(Spanish only; electronic copy only)**
194. Fifth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, France, 2002
195. Sixth Session of the IOC-WMO-UNEP-ICSU Steering Committee of the Global Ocean Observing System, South Africa, 2003
196. Fourth Session of the Coastal Ocean Observations Panel, South Africa, 2002 **(electronic copy only)**
197. First Session of the JCOMM/IODE Expert Team On Data Management Practices, Belgium, 2003 *(also JCOMM Meeting Report No. 25)*
198. Fifth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), Paris, 2003
199. Ninth Session of the IOC Consultative Group on Ocean Mapping, Monaco, 2003 **(Recommendations in English, French, Russian and Spanish included)**
200. Eighth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), France, 2003 **(electronic copy only)**
201. Fourth Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Greece, 2004 **(also printed in French)**
202. Sixth Session of the IOC-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), Paris, 2004 **(electronic copy only)**
203. Fifth Session of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Argentina, 2005 **(also printed in French)**
204. Ninth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), France, 2005 **(electronic copy only)**
205. Eighth Session of the IOC/WESTPAC Co-ordinating Committee for the North-East Asian Regional – Global Ocean Observing System (NEAR-GOOS), China, 2003 **(electronic copy only)**
206. Sixth Meeting of the Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Spain, 2006 **(also printed in French)**
207. Third Session of the Regional Forum of the Global Ocean Observing System, South Africa, 2006 **(electronic copy only)**
208. Seventh Session of the IOC-UNEP-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), Paris, 2005 **(electronic copy only)**
209. Eighth Session of the IOC-UNEP-IUCN-NOAA Consultative Meeting on Large Marine Ecosystems (LMEs), Paris, 2006 **(electronic copy only)**
210. Seventh Meeting of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Gabon, 2007 **(bilingual English/French)**
211. First Meeting of the IOC Working Group on the Future of IOC, Paris, 2008 **(Executive Summary in English, French, Russian and Spanish included)**
212. First meeting of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, 3–4 April 2008 **(Executive Summary in English, French, Russian and Spanish included)**
213. First Session of the Panel for Integrated Coastal Observation (PICO-I), Paris, 10–11 April 2008 **(electronic copy only)**
214. Tenth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), Paris, 6–8 June 2007 **(electronic copy only)**
215. Eighth Meeting of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Paris, 21–25 April 2008 **(bilingual English/French)**
216. Fourth Session of the Global Ocean Observing System (GOOS) Regional Alliances Forum (GRF), Guayaquil, Ecuador, 25–27 November 2008 **(electronic copy only)**
217. Second Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, 27 March 2009 **(Executive Summary in English, French, Russian and Spanish included)**
218. Ninth Meeting of the IOC Advisory Body of Experts on the Law of the Sea (IOC/ABE-LOS), Paris, 30 March–3 April 2009 **(bilingual English/French)**
219. First Session of the IOC-SCOR International Ocean Carbon Coordination Project (IOCCP) Scientific Steering Group (also IOCCP Reports, 3), Broomfield, Colorado, U.S.A., 1 October 2005 **(electronic copy only)**
220. Second Session of the IOC-SCOR International Ocean Carbon Coordination Project (IOCCP) Scientific Steering Group (also IOCCP Reports, 6), Paris, France, 20 April 2007 **(electronic copy only)**
221. Third Session of the IOC-SCOR International Ocean Carbon Coordination Project (IOCCP) Scientific Steering Group (also IOCCP Reports, 10), Villefranche-sur-mer, France, 3–4 October 2008 **(electronic copy only)**
222. Fourth Session of the IOC-SCOR International Ocean Carbon Coordination Project (IOCCP) Scientific Steering Group (also IOCCP Reports, 15), Jena, Germany, 14 September 2009 **(electronic copy only)**
223. First Meeting of the joint IOC-ICES Study Group on Nutrient Standards (SGONS) (also IOCCP Reports, 20), Paris, France, 23–24 March 2010 **(Executive Summary in E, F, R, S included)**
224. Third Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Lisbon, Portugal, 5–6 May 2010 **(Executive Summary in English, French, Russian and Spanish included)**
225. Eleventh Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), Paris, 13–15 May 2009 **(electronic copy only)**
226. Second Session of the Panel for Integrated Coastal Observation (PICO-II), Paris, 24–26 February 2009 **(electronic copy only)**
227. First meeting of the Task Team on Seismic Data Exchange in the South West Pacific of the ICG/PTWS Regional Working Group for the Southwest Pacific, Port Vila, Vanuatu, 19–20 October 2009 **(electronic copy only)**
228. Fourth Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, France, 20–21 March 2011 **(Executive Summary in English, French, Russian and Spanish included)**
229. Second Session of the IODE Steering Group for Ocean Teacher (SG-OT), Miami, Florida, 11–15 April 2011
230. First Meeting of the Inter-ICG Task Team 1 on Sea Level Monitoring for Tsunami (Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Seattle, USA, 29 November–1 December 2010
231. First Meeting of the Inter-ICG Task Team 2 on Disaster Management and Preparedness (Working Group on Tsunamis and Other Hazards Related to

- Sea-Level Warning and Mitigation Systems (TOWS-WG), Seattle, USA, 29 November–1 December 2010
232. First Meeting of the Inter-ICG Task Team 3 on Tsunami Watch Operations (Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Seattle, USA, 29 November–1 December 2010
 233. Primera Reunión del Grupo de Trabajo Regional para América Central del Grupo Intergubernamental de Coordinación del Sistema de Alerta contra los Tsunamis y Atenuación de sus Efectos en el Pacífico (ICG/PTWS), Managua (Nicaragua) del 4 al 6 de noviembre de 2009 (**Resumen dispositivo en español e inglés**)
 234. Segunda Reunión del Grupo de Trabajo Regional para América Central del Grupo Intergubernamental de Coordinación del Sistema de Alerta contra los Tsunamis y Atenuación de sus Efectos en el Pacífico (ICG/PTWS), San Salvador (El Salvador) del 28 al 30 de septiembre de 2011 (**Resumen dispositivo en español e inglés**)
 235. First Session of the Joint IODE-JCOMM Steering Group for the Global Temperature-Salinity Profile Programme (SG-GTSP), 16–20 April 2012, Ostend, Belgium
 236. Ad hoc Session of the Joint JCOMM-IODE Steering Group for the Ocean Data Standards Pilot Project (SG-ODSPP), 23–25 April 2012, Ostend, Belgium
 237. First Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the South China Sea Region (SCS-WG), Sanya, China, 12–14 December 2011
 238. First Meeting of the IODE Steering Group for OceanDocs (SG-OceanDocs), 24–27 January 2012, Ostend, Belgium
 239. Fifth Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Tokyo, Japan, 15 February 2012 (**Executive Summary in English, French, Russian and Spanish included**)
 240. Ad hoc Session of the IODE Group of Experts on Biological and Chemical Data Management and Exchange Practices (GE-BICH), Ostend, Belgium, 25 October 2012
 241. Twelfth Session of the IODE Group of Experts on Marine Information Management (GE-MIM), Miami, USA, 22–25 January 2013
 242. Twelfth Session of the IOC Group of Experts on the Global Sea level Observing System (GLOSS), Paris, 9–11 November 2011 (**electronic copy only**)
 243. Meeting of the Pacific Tsunami Warning System Working Group 2 on Detection, Warning and Dissemination Task Team on PacWave11, Honolulu, USA, 21 May 2012 (**electronic copy only**)
 244. Sixth Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, 20–21 February 2013 (**Executive Summary in English, French, Russian and Spanish included**)
 245. Second Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the South China Sea Region (SCS-WG), Petaling Jaya, Malaysia, 16–18 October 2012 (**electronic copy only**)
 246. Seventh Meeting of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems, UNESCO, Paris, 12–13 February 2014 (**Executive Summary in English, French, Russian and Spanish included**)
 247. Third Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the South China Sea Region (SCS-WG), Hong-Kong, China, 6–7 April 2014 (**electronic copy only**)
 248. Tercera Reunión del Grupo de Trabajo Regional para América Central del Grupo Intergubernamental de Coordinación del Sistema de Alerta contra los Tsunamis y Atenuación de sus Efectos en el Pacífico (ICG/PTWS), Managua, Nicaragua, del 29 al 30 de septiembre de 2014 (**Resumen dispositivo en español e inglés**)
 249. Workshop on Tsunami Modelling and Mitigation of the ICG/CARIBE-EWS Working Group 2: Tsunami Hazard Assessment, 1–3 December 2014, Cartagena de Indias, Colombia (**electronic copy only**)
 250. Fourth meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the South China Sea Region (SCS-WG), Jakarta, Indonesia, 11–12 February 2015 (**electronic copy only**)
 251. Eighth Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, 12–13 March 2015 (**Executive Summary in English, French, Russian and Spanish included**)
 252. Ninth Meeting of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems, UNESCO, Paris, 25-26 February 2016 (**Executive Summary in English, French, Russian and Spanish included**)
 253. Fifth Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the South China Sea Region (SCS-WG), Manila, Philippines, 2–3 March 2016 (**electronic copy only**)
 254. Second Meeting of the Regional Working Group for the North West Indian Ocean (WG-NWIO), Tehran, Islamic Republic of, 27–28 February 2017 (**electronic copy only**)
 255. Sixth Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the South China Sea Region (SCS-WG), Shanghai, China, 1–3 March 2017 (**electronic copy only**)
 256. Tenth Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, 23–24 February 2017 (**Executive Summary in English, French, Russian and Spanish included**)
 257. First Meeting of the Group of Experts on Capacity Development (GE-CD), Paris, 21–23 March 2018 (**electronic copy only**)
 258. Eleventh Session of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG), Paris, 16–17 February 2018 (**Executive Summary in English, French, Russian and Spanish included**)
 259. Seventh Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the South China Sea Region (SCS-WG), Hanoi, Vietnam, 6–8 March 2018 (**electronic copy only**)
 260. Cuarta reunión del Grupo de Trabajo Regional para América Central del Grupo Intergubernamental de Coordinación del Sistema de Alerta contra los Tsunamis y Atenuación de sus Efectos en el Pacífico (ICG/PTWS), Managua (Nicaragua) el 11 de febrero de 2019 (**Resumen dispositivo y recomendación en español e inglés**)
 261. Eighth Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the South China Sea Region (SCS-WG), Jakarta, Indonesia, 4–6 March 2019 (**electronic copy only**)
 262. First Joint Meeting of the Task Teams of the IOC Group of Experts on Capacity Development: Capacity development requirements of Member States and implementation of a Clearing House Mechanism (CHM) for the Transfer of Marine Technology, UNESCO, Paris, 13–14 March 2019 (**electronic copy only**)
 263. Twelfth Meeting of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG-XII), Paris, 21–22 February 2019 (**Executive Summary in English, French, Russian and Spanish included**)
 264. Seventh Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the Pacific Islands Countries and Territories (PICTs-WG), 8 March 2019, Noumea, New Caledonia (**electronic copy only**).
 265. Thirteenth Meeting of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG-XIII), Paris, 20–21 February 2020 (**Executive Summary in English, French, Russian and Spanish included**)
 266. Second Meeting of the Group of Experts on Capacity Development (GE-CD), 26 October 2020, (online). (**electronic copy only**)
 267. Fourteenth Meeting of the Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG-XIV), Online, 25–26 February 2021 (**Executive Summary in English, French, Russian and Spanish included**)

268 Eighth Meeting of the Regional Working Group on Tsunami Warning and Mitigation System for the Pacific Islands Countries and Territories (PICTs-WG), 29 March–1 April 2021 (online)