

ICG/PTWS - XXX Session

Nuku'alofa, Tonga

11 – 15 September 2023



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3.1 CHAIRPERSON REPORT

NISHIMAE Yuji
Chair, ICG/PTWS

Major Meetings and Events related to the ICG/PTWS from December 2021 to August 2023



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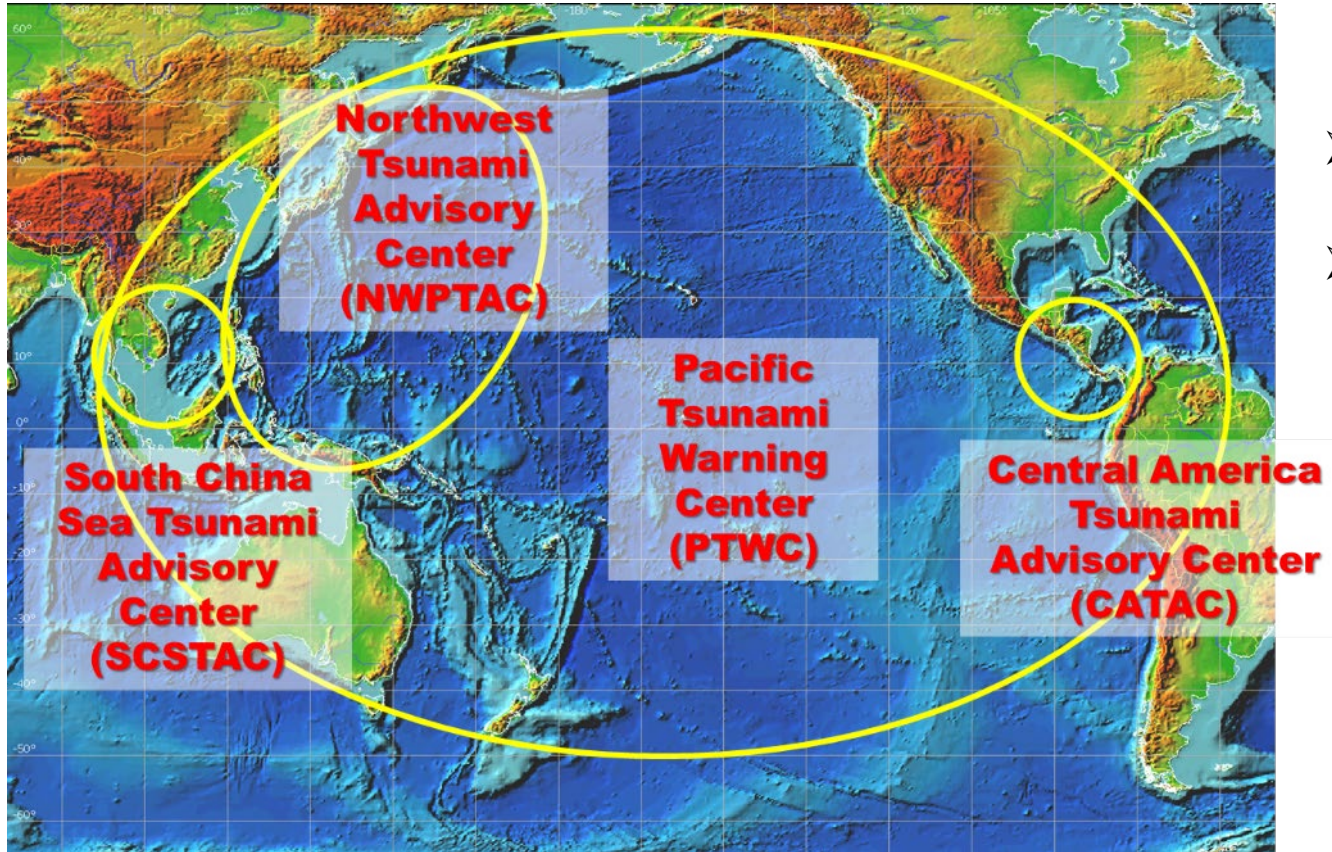
Year	Date	Month	Meeting and Events
2021	1, 2, 7, 8	December	ICG/PTWS 29 th Session (online)
2022	15	January	Hunga Tonga-Hunga Ha'apai Volcano eruption and Tsunamis
2022	20, 3, 10	January, February	Hunga Tonga-Hunga Ha'apai Volcano eruption and tsunamis debriefing meetings (online)
2022	21 – 22	February	TOWS-WG TTTWO and TTDMP (online)
2022	21 – 22	February	TOWS-WG 15 th session (online)
2022	13 – 17	June	IOC 55 th Executive Council
2022	12	July	PTWS Steering Committee meeting (online)
2022		September – November	Pacific Wave 2022
2022	13	October	PacWave 22 Live Communication Test
2023	27 – 28	February	TOWS-WG TTTO and TTDMP
2023	2 – 3	March	TOWS-WG 16 th session
2023	6 – 9	March	PTWS Steering Committee meeting
2023	21 – 30	June	IOC 32 nd Assembly

Tsunami Service Providers (TSPs) in the Pacific



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- Four TSPs (PTWC, NWPTAC, SCSTAC, CATAC) are now in operation.
- CATAC is fully operated (24hours/7days) on the interim service.

Recommendation at the ICG/PTWS 29th Session (ICG/PTWS-XXIX.5)

- Requests the CATAC to make an effort in order to use the Global Telecommunication system (GTS) for dissemination of information and to make English format of information for the global communication;
- Noting that the approval of both the ICG/CARIBE-EWS and IOC are necessary for the official full functional operations of CATAC;
- Decides to admit the start of CATAC's full functionality on the interim service as of 17 January 2022

ICG/CARIBE-EWS 16th Session

- **The ICG recommended** the start of CATAC's full functionality in an interim manner for the Caribbean coast of Central America, starting in June 2023 (as already decided by the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS-XXIX) for the Pacific coast of Central America, as from December 2021).
- **The ICG further recommended** the consideration of Central America Tsunami Advisory Centre (CATAC) as a Tsunami Service Provider (TSP) at its 17th session in 2024 to enable the IOC Executive Council to consider the final admission of CATAC as TSP in June 2024.

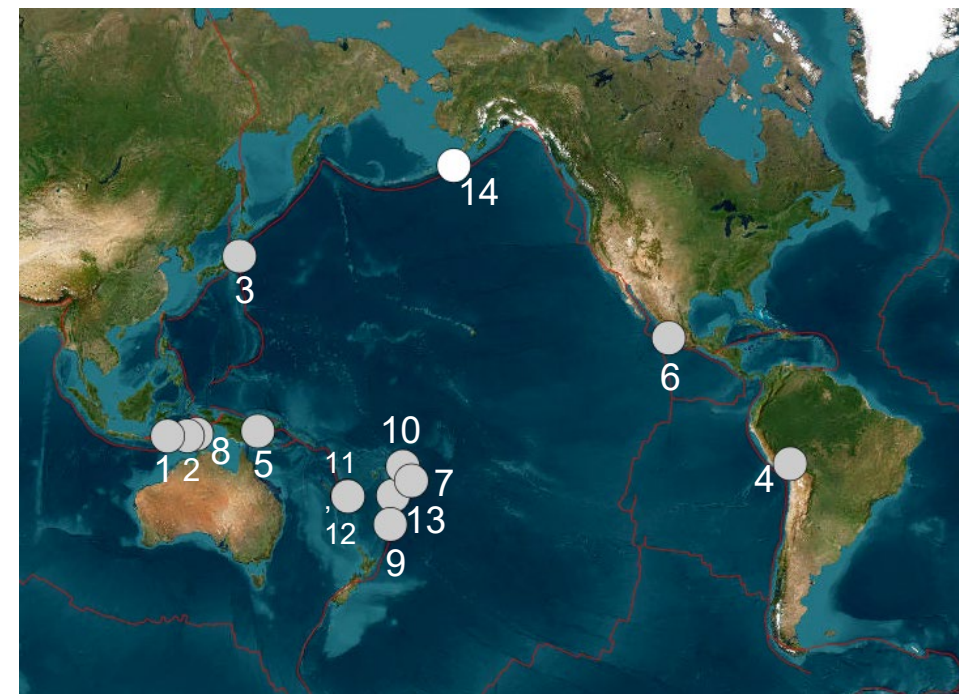
Significant earthquakes from December 2021 to August 2023 (M>7.0)



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No	Time	Latitude	Longitude	Depth	Mag	Mag type	Max. tsunami height (m)
1	2021-12-14T03:20:23.809Z	-7.60	122.23	14	7.3	Mww	0.07
2	2021-12-29T18:25:51.962Z	-7.55	127.58	165	7.3	Mww	no tsunami
3	2022-03-16T14:36:30.997Z	37.71	141.58	41	7.3	Mww	0.31**
5	2022-05-26T12:02:21.110Z	-14.91	-70.29	236	7.2	Mww	no tsunami
5	2022-09-10T23:47:00.233Z	-6.29	146.50	116	7.6	Mww	no tsunami
6	2022-09-19T18:05:08.217Z	18.46	-102.96	27	7.6	Mww	0.79*
7	2022-11-11T10:48:46.710Z	-19.29	-172.15	37	7.3	Mww	0.12*
8	2023-01-09T17:47:35.038Z	-7.07	130.00	105	7.6	Mww	0.09*
9	2023-04-24T00:41:55.894Z	-29.96	-177.84	47	7.1	Mww	0.11*
10	2023-05-10T16:02:00.334Z	-15.63	-174.49	210	7.6	Mww	no tsunami
11	2023-05-19T02:57:03.172Z	-23.21	170.74	18	7.7	Mww	0.61*
12	2023-05-20T01:50:59.158Z	-23.04	170.56	27	7.1	Mww	0.14*
13	2023-06-15T18:06:28.572Z	-22.99	-177.11	179	7.2	Mww	no tsunami
14	2023-07-16T06:48:22.606Z	54.46	-160.76	33	7.2	Mww	0.15*



Earthquake Source Parameters by USGS

Tsunami height by;

*: NGDC/WDS Global Historical Tsunami Database

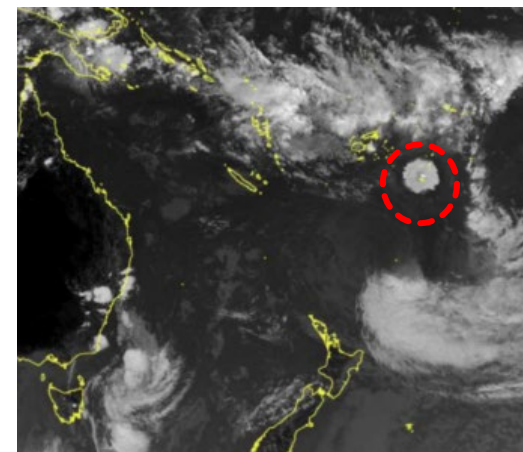
** : Japan Meteorological Agency

PTWS responses to 15 January 2022, Hunga Tonga-Hunga Ha'apai Volcanic Eruption and Tsunami

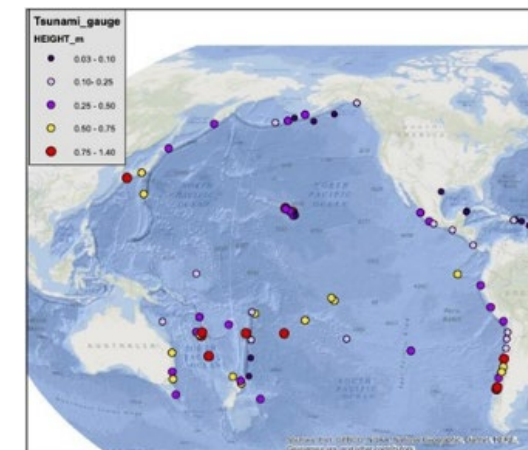
- Hunga Tonga-Hunga Ha'apai Volcano erupted on 15 January 2022.
- Tsunami waves were observed at not only near tide gauges but also distant tide gauges.- Larger than 1 meter in California of USA, Chile, Japan.
- PTWS held Debrief meetings three times; 20 January, 3, 10 February.
 - Objectives of the meeting
 - ✓ Interim Volcanic Tsunami SOP – What to do if it happens again.
 - ✓ Review what happened in TWCs – share experiences with TWCs : what was available, what was not



Location of Hunga-Tonga Hunga-Ha'apai volcano



Ash cloud detected by the meteorological satellite Himawari-8



maximum tsunami amplitude reported by PTWC on 15 January

PTWS Interim Procedures Implementation Plan and Users Guide for the future event



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- Preparation for the future event – What to do if the event happens again.
- Small temporary task team was established to work for implementation plan.
- Tsunami amplitudes are forecasted by scaling observed maximum amplitudes observed across the Pacific from the January 15 event with observed amplitudes for any future event, starting with the observed amplitudes at Nuku'alofa and the NZG DART.
- PTWC provides special products for a HTHH volcano generated tsunami.
- 12 July: PTWS Steering Committee
- 17 August: User's Guide Published (CL-2902)
- 6 September: ICG/PTWS HTHH Interim Procedures and PTWS Products Informational Webinar
- PICT drill in the PacWave 2022 to test interim procedures
- Implementation Plan and Users Guide will be officially endorsed at the ICG/PTWS 30th Session

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
COMMISSION Océanographique Intergouvernementale
COMISION OCEANOGRÁFICA INTERGUBERNAMENTAL
МЕЖПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ
اللجنة الدولية الحكومية لعلوم المحيطات
政府間海洋学委员会

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IOC Circular Letter No 2902
(Available in English only) IOC/VR/BA/ah/RB
17 August 2022

To : Tsunami National Contacts (TNCs),
National Tsunami Warning Centres (NTWCs), and
Tsunami Warning Focal Points (TWFPs) of the Intergovernmental Coordination Group of the Pacific Tsunami Warning and Mitigation System (ICG/PTWS)

cc. : Official National Coordinating Bodies for liaison with the IOC,
Permanent Delegates/Observer Missions to UNESCO, and
National Commissions for UNESCO of IOC ICG/PTWS Member States
Directors of UNESCO and IOC Regional Offices in the Asia/Pacific Region
Permanent Observers to ICG/PTWS
Director Pacific Tsunami Warning Center (PTWC)
Director, Northwest Pacific Tsunami Advisory Center (NWPTAC)
Director, South China Sea Tsunami Advisory Center (SCSTAC)
Director, International Tsunami Information Center (ITIC)
ICG/PTWS Officers
ICG/PTWS Steering Committee

Subject: PTWC Interim Procedures and PTWS products for Tsunamis developed after the Hunga Tonga Hunga Ha'apai Volcano event (User's Guide and informational webinar on 6 September 2022)

The massive explosion on the volcanic island of Hunga Tonga-Hunga Ha'apai (HTHH), about 30 km (19 mi) south-southeast of Fonuafo'ou Island in Tonga, on 15 January 2022 at about 4:14 UTC, generated a tsunami that caused damages locally, regionally, and across the Pacific.

This was the first time that the Pacific Tsunami Warning Center (PTWC) had to respond to such an event, since its system is primarily focused on earthquake-generated tsunamis representing nearly 90% of the past cases of tsunamis in the world.

Following this event and with reference to the information provided in the IOC [Circular Letter 2877](#) regarding the launch of an IOC Post-Event Assessment for the HTHH volcanic eruption and tsunami, we are pleased to confirm that nearly all Member States of the ICG/PTWS did respond to the online survey. The results of this assessment will be published by 30 September 2022.

In response to the HTHH volcanic explosion and tsunami, the Intergovernmental Coordination Group (ICG) for the Pacific Tsunami Warning and Mitigation System (PTWS) established a Task Team on Tsunami Hazard Response and requested it to prepare a PTWS Interim Volcanic Tsunami Alert

<p>Chairperson Mr Ariel Herman TROISI Technical Secretary Navy Hydrographic Service Av. Montes de Oca 2124 C1279AKV Buenos Aires ARGENTINA</p> <p>Executive Secretary Dr Vladimir RYABININ Intergovernmental Oceanographic Commission – UNESCO 7 Place de Fontenay 75352 Paris Cedex 07 SP FRANCE</p>	<p>Vice-Chairpersons Dr Marie-Alexandrine SICRE Directrice de Recherche Centre national de la recherche scientifique (CNRS) 3 rue Michel Ange 75016 Paris FRANCE</p> <p>Dr Alexander FROLOV Assistant to the President National Research Center "Kurchatov Institute" Akademika Kurchatova st. 1 123182 Moscow RUSSIAN FEDERATION</p>	<p>Mr Frederico Antonio SARAIVA NOGUEIRA Navy Captain (Ret) Director of Hydrography and Navigation Rua Barão de Jacquin S/N 24048-900 Mairá BRAZIL</p> <p>Dr Srinivasa Kumar TUMMALA Director Indian National Centre for Ocean Information Services (INCOIS) Pragathi Nagar (BC), Nuzvid (S) Hyderabad 500095 INDIA</p>	<p>Dr Karim HELMI Head of Oceanography Department Institut National de Recherche Halieutique (INRH) 02, Boulevard Sid Abderrahmane Ain Dab 20150 Casablanca MOROCCO</p>
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HTHH Volcanic Tsunami Hazard Response:
ICG/PTWS PTWC Interim Procedures and PTWS Products User's Guide, V1.3

Hunga Tonga – Hunga Ha'apai Volcanic Tsunami Hazard Response

Intergovernmental Coordination Group for Pacific Tsunami Warning and Mitigation System (ICG/PTWS) PTWC Interim Procedures and PTWS Products User's Guide Version 1.3, 25 July 2022

Due to the potential for another Hunga Tonga–Hunga Ha'apai volcanic eruption and tsunami, immediate development of an intergovernmental Coordination Group for Pacific Tsunami Warning and Mitigation System (ICG/PTWS) Interim Procedures Implementation Plan for the Hunga Tonga–Hunga Ha'apai Volcanic Tsunami Hazard Response was initiated. This followed the proposal presented to Member States, their feedback, and agreed upon 'Actions Forward' concluded from the PTWS Post-Event Brief I: 15 January 2022: Hunga Tonga–Hunga Ha'apai Volcanic Eruption and Tsunami held on 20 January 2022. Further Member State feedback was provided during PTWS Post-Event Brief II on 3 February 2022 and PTWS Post-Event Brief III on 10 February 2022.

To facilitate implementation of the PTWS Interim Volcanic Tsunami Alert Products and Procedures, the ICG/PTWS established a Task Team on the HTHH Volcanic Tsunami Hazard Response. The Task Team finalised the Implementation Plan and it was endorsed by the ICG/PTWS Steering Committee on 1 March 2022 (v1.1).

This document now details the ICG/PTWS PTWC Interim Procedures and PTWS Products User's Guide, which was developed by the Task Team, reviewed in consensus by the ICG/PTWS Steering Committee and subsequently approved by the Chair of ICG/PTWS on 25 July 2022 (v1.3)

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Discussion in the TOWS-WG related to non-seismic tsunamis



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Decision and Recommendation in the TOWS-WG 15th session

- **The Group decided** to establish a specific Ad Hoc Team on Meteo-tsunamis under the Task Team on Tsunami Watch Operations (TT TWO) chaired by Mr Mike Angove
- **The Group decided** to establish an Ad Hoc Team on Tsunamis Generated by Volcanoes chaired by Dr Francois Schindele

Decision and Recommendation in the TOWS-WG 16th session

- **Ad Hoc Team on Tsunamis Generated by Volcanoes.**

The Group decided warning systems for tsunamis generated by volcanoes should be considered and coordinated as part of the UNESCO/IOC Global tsunami and other Ocean-related Hazards Warning and Mitigation System (GOHWMS), and also when possible be part of a MHEWS.

The Group decided to continue the *Ad Hoc* Team on Tsunamis Generated by Volcanoes in order to complete its report in time for tabling at the IOC Assembly at its 32nd Session in 2023 by the Chair of TOWS-WG.

- **Ad Hoc Team on Meteotsunamis.**

The Group acknowledged that meteotsunamis are a meteorological driven phenomenon, and as such, better clarifying the roles of NMHS and WMO will be critical in supporting the development of any potential future detection and alerting service for meteotsunamis.

The Group decided to continue the *Ad Hoc* Team on Meteotsunamis to finalise its report, **recommended** that WMO experts be engaged to assist in this task, and **also acknowledged** that WMO requests the WMO-IOC Joint Collaborative Board to discuss tsunami related issues with respect to meteotsunami, to clarify the roles and responsibilities for the WMO and UNESCO/IOC, and how best to strengthen collaboration for supporting Member States.

The reports of the both teams were submitted at the TOWS-WG 16th session.



PTWS Steering Committee (July 12, 2022) (online)



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- The Kingdom of Tonga offered the host country for the PTWS 30th session in September 2023.
- The PTWS-SC discussed “HTHH PTWC Interim Procedures and PTWS Products – User’s Guide”.
 - ✓ User’s Guide was published on 17th August 2022 (CL-2902)
 - ✓ Official endorsement in the PTWS 30th Session
- The PTWS-SC decided the next PTWS-SC will be held back-to-back with the next TOWS-WG.



PTWS Steering Committee (6 – 9 March, 2023) (Paris)



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Agenda

1. Welcome and Opening
2. Adoption of Agenda
3. Review of Action Items from the ICG/PTWS XXIX session
4. Report on the IOC EC 55th Session and TOWS-WG from the Chair
5. Report of Tsunami Service Providers
6. Report of Working Groups
7. Report of Task Teams
8. Report of ITIC
9. Expansion of PTWS's Earthquake Source Zone
10. Provision of Tsunami Information of the TSPs to Maritime Community for Navigational Warning
11. TSPs User's Guide
12. Formally full operation of the CATAC
13. Progress of Tsunami Ready Recognition Programme in the Pacific
14. PTWS role in the Tsunami Ready Coalition
15. UN Decade of Ocean Science for Sustainable Development (ODTP Research, Development and Implementation Plan)
16. Tsunami Warning for non-seismic generated Tsunamis
 - 16.1 Volcano Generated Tsunamis: included the new established HTHH interim warning system
 - 16.2 Meteo-tsunamis
17. Date and Venue of the PTWS-XXX Session
18. Draft Agenda of the PTWS-XXX Session
19. Scientific Symposium
20. Any Other Business
21. Closing



Recommendations of PTWS Steering Committee in March 2023



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Agenda	Recommendation	ICG/PTWS XXX
INTERNATIONAL TSUNAMI INFORMATION CENTRE	The Group instructed the ICG/PTWS TT on Minimum Competency Levels for NTWC Operational Staff to finalize the draft Global Competency Framework for NTWCs to be presented at ICG/PTWS-XXX.	Agenda 3.5, 4.3
EXPANSION OF PTWS EARTHQUAKE SOURCE ZONE	The Group recommended that the issue of expanding the PTWS earthquake source zone into the southern Atlantic Ocean to cover the seismicity associated with the Scotia Subduction Zone be discussed at ICG/PTWS-XXX in Tonga. If the ICG agrees with the expansion, then it will instruct the IOC to change the PTWS earthquake source zone map in the TS 130 (2016 version) and this decision will be reported back to the TT-TWO and the TOWS-WG.	Agenda 4.5
PROVISION OF TSUNAMI INFORMATION OF THE TSPs TO THE MARTIME COMMUNITY FOR NAVIGATIONAL WARNING	The Group recommended the establishment of a TT on the provision of tsunami information of the TSPs to the maritime community for navigational warning with the following membership: All TSPs (PTWC, NWPTAC, SCSTAC), Chile, Peru and Australia. The Group instructed the Secretariat to send an email to formally launch the TT and support holding of a TT meeting before September 2023.	Agenda 4.6
TSP USER's GUIDE	The Group agreed that a final version of the TSP User's Guide Table of Contents would be prepared for approval or modification by ICG/PTWS-XXX in September 2023 in Tonga. The Group also agreed that, following ICG/PTWS-XXX, the TT TSP will work with each ICG/PTWS TSP [PTWC, NWPTAC, SCSTAC, CATAC (interim service)] to determine a timeline for creating an updated version of each of their User's Guides. The Group further agreed that each TSP will then work with its regional WG on approving updated versions of its User's Guides; for PTWC, the Steering Committee will review and approve. Once the User's Guides are updated and approved regionally, they will be submitted to the ICG/PTWS for endorsement.	Agenda 4.7



Recommendations of PTWS Steering Committee in March 2023 (continued)



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Agenda	Recommendation	ICG/PTWS XXX
<p>FORMAL FULL OPERATION OF THE CATAC</p>	<p>The Group agreed for the full operation of CATAC to discussed and endorsed at the ICG/PTWS-XXX in Tonga. The Group also requested CATAC to prepare a report about the full operation of CATAC and propose a start date for the full operation of CATAC, at ICG/PTWS-XXX</p>	<p>Agenda 4.9</p>
<p>PROGRESS OF TSUNAMI READY RECOGNITION PROGRAMME IN THE PACIFIC</p>	<p>The Group agreed for WG3 to prepare in collaboration with the TT UN Ocean Decade for ICG/PTWS-XXX an Information Document exploring the potential governance structure for Tsunami Ready within the PTWS, considering sustainability beyond the UN Ocean Decade. The Group also agreed that this document should be disseminated to WG 1, WG 2, TT Future Goals and Performance Monitoring and all Regional WGs in advance of ICG/PTWS-XXX (via the ICG/PTWS Secretariat) to receive and incorporate feedback into the Information Document.</p> <p>The Group recognized the importance of incorporating countries with developed preparedness programmes but are not involved in UNESCO/IOC Tsunami Ready into the UNESCO/IOC Tsunami Ready recognition programme. The Group agreed for WG3 to prepare in collaboration with the TT UN Ocean Decade for ICG/PTWS-XXX an Information Document exploring suggestions for incorporating these countries into the UNESCO/IOC Tsunami Ready recognition programme. The Group also agreed that this document should be disseminated to WG 1, WG 2, TT Future Goals and Performance Monitoring and all Regional WGs in advance of ICG/PTWS-XXX (via the ICG/PTWS Secretariat) to receive and incorporate feedback into the Information Document.</p> <p>The Group also agreed the ICG/PTWS Secretariat, with support from WG3, would encourage additional membership to WG3 through an email sent to ICG/PTWS TNCs.</p>	<p>Agenda 4.2</p>

Recommendations of PTWS Steering Committee in March 2023 (continued)



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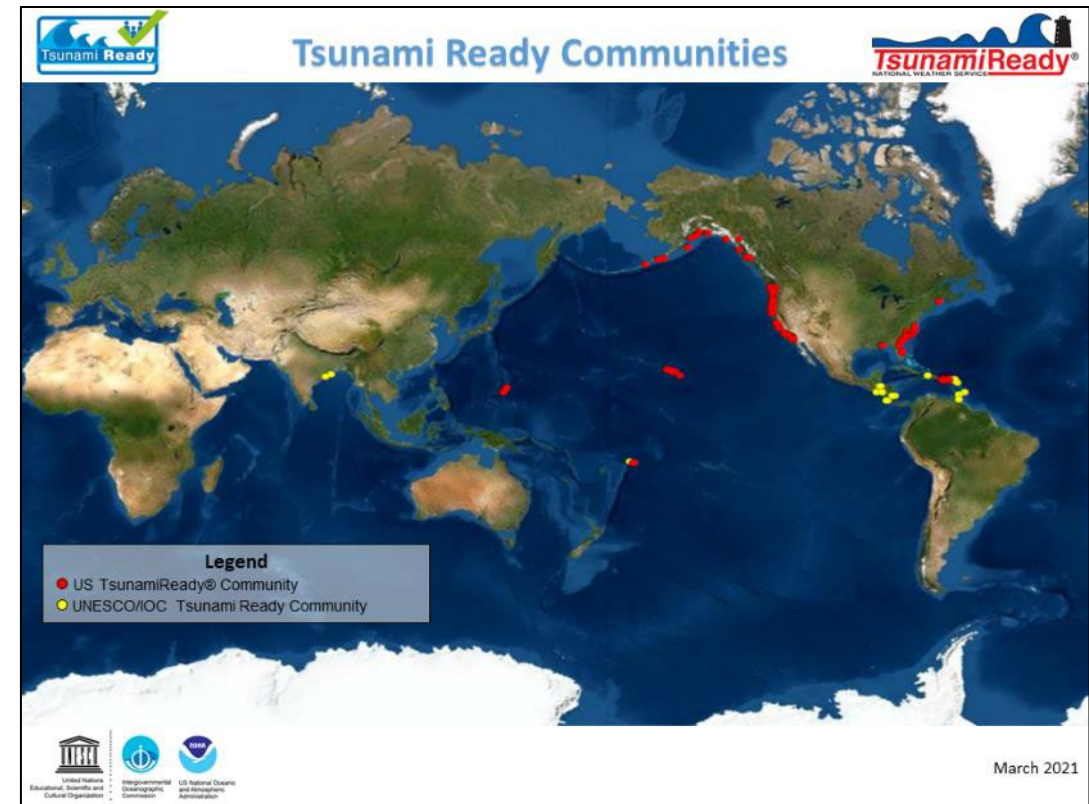
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Agenda	Recommendation	
DATE AND VENUE OF THE ICG/PTWS-XXX SESSION	<p>The Group agreed that the Chair, Mr Nishimae, would initiate follow-up with Mr Ofa Fa'anunu (Tonga), in coordination with Mr Jiuta Korovulavula and the Secretariat.</p> <p>The Group agreed on an updated draft agenda.</p>	<p>The ICG/PTWS-XXX Session has been held on 11-15 September, 2023.</p>
SCIENTIFIC SYMPOSIUM	<p>The Group recognized that the Scientific Symposium is a collaboration between the IUGG Joint Tsunami Commission, UNESCO/IOC and the host country (here, the Kingdom of Tonga). The Group emphasized the importance of engaging with representatives from the Kingdom of Tonga to organize the Scientific Symposium, including within the Organizing Committee. This would provide the opportunity for establishing dates and duration of, and funding for, the event. The Group agreed that the ICG/PTWS Secretariat would discuss logistics and costs with representatives from the Kingdom of Tonga. The Group also agreed that the ICG/PTWS Chair, Mr Yuji Nishimae, would reach out to the IUGG Joint Tsunami Commission Chair, Dr Yuichiro Tanioka, to initiate engagement on organization of the Scientific Symposium.</p>	<p>Joint Tsunami workshop was held on 11 September, 2023</p>



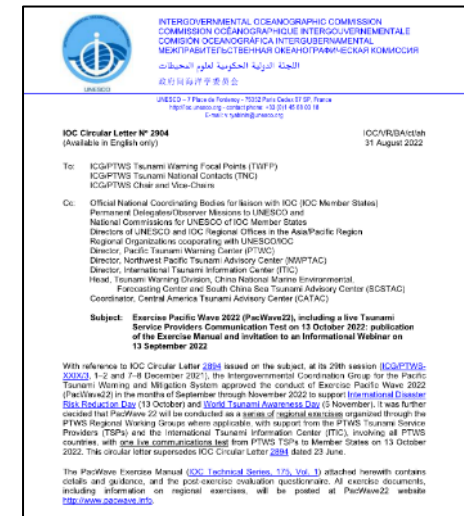
IOC/UNESCO Tsunami Ready Recognition Program

- Honduras
 - Cedeño
- Costa Rica
 - Ostional
 - Samara
 - Tamarindo
 - Playas El Coco
 - Quepos
 - Uvita-Bahía
- Samoa
 - Savaia, Upolu
- Guatemala
 - San Jose
 - Sipacate
- Panama
 - Puerto Armuelles
- Ecuador
 - Galapagos
- El Salvador
 - La Libertad
 - Tamanique



14 communities of 7 countries has been certified

Exercise Pacific Wave 2022



PacWave22

- 23rd June: PacWave 22 was announced (CL-2894).
- 31st August: PacWave 22 manual was distributed (CL-2904).
- 13th September: Informational Webinar
- 13th October 0000 UTC: Live Communications Test was conducted by the TSPs
- ✓ PTWC, NWPTAC, SCSTAC and CATAAC sent the test message.

➤ PICT Regional Exercise

- 2nd November: Exercise Pacific Wave 2022 - Pacific Island Countries and Territories (PICT) Informational Webinar
- 2300 UTC 9 Nov to 0100 UTC 10 November: PICT Regional Exercise
- ✓ Exercise Scenario: HTHH eruption and tsunami on 15 January, 2022
- 16th November: Exercise Pacific Wave 2022 - Pacific Island Countries and Territories (PICT): Cold Wash and Debrief

Expansion of the ICG/PTWS Earthquake Source Zone



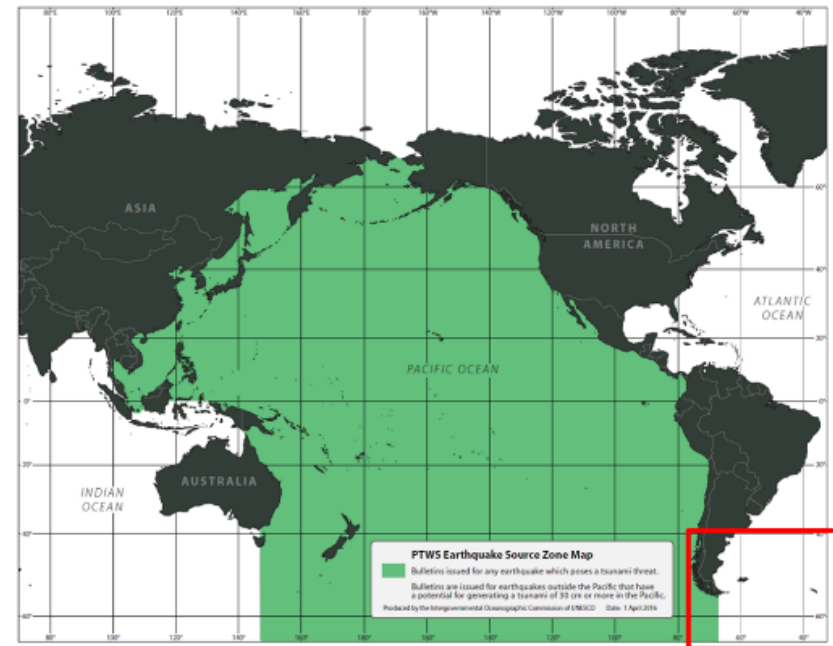
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Decision of the ICG/PTWS 29th session

In the PTWS XXIX session, PTWS decided that the PTWS Earthquake Source Zone be expanded to include the southernmost Atlantic seismic region to routinely provide Member States of the PTWS with information about the frequent large earthquakes from this region and any subsequent tsunami threat.

- The decision of the ICG/PTWS 29th session was submitted to the TOWS-WG 15th session in February 2022 and then was submitted to the IOC 55th Executive Council through discussion at the TOWS-WG 15th session.
- However, the PTWS's decision was removed from the IOC Decisions and expansion of the PTWS Earthquake Source Zone has not yet realized.
- The PTWS Steering Committee was held in March 2023 and the PTWS Steering Committee decided the recommendation related to this issue.



UN Ocean Decade Tsunami Program (UNODTP)



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UNODTP Research & Development Implementation Plan was endorsed at the IOC 32nd Assembly.

Two objectives of UNODTP;

1. The first objective to develop the warning systems' capability to issue actionable and timely tsunami warnings for tsunamis from all identified sources to 100 percent of coasts at risk.
2. The second objective is that 100 percent of communities at risk to be prepared and resilient to tsunamis by 2030 through efforts like the IOC-UNESCO Tsunami Ready Recognition Programme.

Intergovernmental Oceanographic Commission
Technical Series



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**Research, Development and
Implementation Plan for the Ocean
Decade Tsunami Programme**

April 2023

The second International Tsunami Symposium in Aceh (Indonesia), 2024



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Decision and Recommendation in the TOWS-WG 16th session

- **The Group decided** to organize a Scientific Symposium and **recommended** an Organizing Committee be composed of two Co-chairs nominated by the TT-TWO and TT-DMP, the Chair of the UN Ocean Decade Tsunami Programme Scientific Committee (ODTP-SC), a representative from the Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG), a representative of the IUGG-Joint Tsunami Commission, and a representative of each of the TICs.
- **The Group accepted** with appreciation the offer of the Government of the Republic of Indonesia to host the symposium in December 2024 as part of the plans by the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) to commemorate the 20th Anniversary of the Indian Ocean Tsunami of 2004.





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Future Events from 2023 to 2024 related to the ICG/PTWS

Year	Month	Event
2023	September	ICG/PTWS 30 th session
2024	February	TOWS-WG 17 th session and TOWS-WG TTDMP and TTTWO
2024	June	IOC 57 th Executive Council
2024	TBD	Officially full operation of the CATAC
2024	September – November (TBC)	Pacific Wave 2024
2024	December (TBC)	The second International Tsunami Symposium in Aceh, Indonesia 2024



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THANK YOU 

