



EXERCISE PACIFIC WAVE 2022

A Pacific-wide Tsunami Warning and Communications Exercise

1 September – 30 November 2022

Volume 1

Exercise Manual

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1. BACKGROUND

The Intergovernmental Oceanographic Commission (IOC) of UNESCO established the International Coordination Group for the Tsunami Warning System in the Pacific (ICG/ITSU) in 1965 in response to the 1960 earthquake off the coast of Chile, which generated a tsunami killing 2,000 people locally, and hundreds in the far field in Hawaii, Japan, and the Philippines. The main focus of the Group is to facilitate the issuance of timely international alerts, and advocate for comprehensive national programmes in hazard assessment, warning guidance, and preparedness [*ITSU Master Plan, 2004 (IOC/INF-1124 Rev.)*; *Medium-term Strategy: Pacific Tsunami Warning and Mitigation System (PTWS MTS), 2014–2021 (IOC/2013/TS/108)*; *PTWS Implementation Plan 2013*, (evolving document, version 4)]. In 2005, ICG/ITSU was re-established as the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS).

The US Pacific Tsunami Warning Center (PTWC), established in 1965 with the start of the Tsunami Warning System in the Pacific, serves as the lead Tsunami Service Provider (TSP) for the Pacific. Because of the Pacific's large size, several regional TSPs have been, or are being, established in order to improve timeliness and threat assessment accuracy, especially for regional events.

In response to Member States' requests for additional regional information, Japan began operation of its Northwest Pacific Tsunami Advisory Center (NWPTAC) in March 2005, and from April 2006 to November 2019 provided services on an interim basis to the South China Sea. The NWPTAC, which serves as the TSP for the Northwest Pacific, provides timely alerts for earthquakes occurring in the Northwest Pacific extending North to South from Russia to the Solomon Islands, and West to East from Thailand to Micronesia. Between 2018 and 12 October 2020, the NWPTAC issued advisories for 38 events.

In 2013, Member States approved the proposal for the South China Sea Tsunami Warning and Mitigation System, and the establishment of the South China Sea Tsunami Advisory Center (SCSTAC) hosted by China. The SCSTAC services countries bordering the South China Sea, Sulu Sea, and Celebes Sea. The SCSTAC began issuing trial products in January 2019 and commenced full operation on 5 November 2019.

A Pacific-wide tsunami exercise is an effective tool for evaluating the readiness of PTWS countries and identifying changes that can improve its effectiveness. The international tsunami exercises were first conceived and conducted in 2006 by the ICG/PTWS under the leadership of the PTWS Exercises Task Team with strong contributions from the International Tsunami Information Centre (ITIC), PTWC, and Japan Meteorological Agency (JMA). Altogether there have been nine IOC-coordinated international tsunami exercises: Exercise Pacific Wave (PacWave) 2006 (IOC/INF-1244), 2008 (IOC/2008/TS/82), 2011, (IOC/2011/TS/97 Vol.1 and 2); 2013 (IOC/2013/TS/106 Vol.1 and 2), 2015 (IOC/2015/TS/117 Vol.1 and 2), 2016 (IOC/2015/TS/126 Vol.1 and 2), 2017 (IOC/2016/TS/131 Vol.1 and 2), 2018 (IOC/2018/TS/139 Vol.1 Rev.2 and Vol. 2) and 2020 (IOC/2020/TS/155 Vol.1).

The exercises, using a multitude of Pacific scenarios and accompanied by tsunami message products from the PTWC, JMA's NWPTAC, the US National Tsunami Warning Center (formerly West Coast and Alaska Tsunami Warning Center), and the SCSTAC, have been used to evaluate the effectiveness of the system and measure the readiness of countries to respond, as national tsunami warning centres (NTWCs) and emergency response agencies and the public, to distant and local tsunamis. Exercise Pacific Wave 2011, 2013, and 2015 were additionally used to introduce and obtain feedback, test, and validate the PTWC new enhanced forecast products, the latter of which became official on 1 October 2014 (CL-2535). Exercise Pacific Wave 2016 and 2017 were used to evaluate experimental NWPTAC enhanced products and identify necessary modifications before the enhanced products were

formally adopted. Exercise Pacific Wave 2017 was also used to support the development of the SCSTAC products. Exercise Pacific Wave 2018 was used to validate the NWPTAC enhanced products, which were officially adopted on 28 February 2019 (CL-2753), and test the new SCSTAC products, which were subsequently adopted on 5 November 2019 (CL-2777). Recently, exercise Pacific Wave 2020 was used to support the development of tsunami procedures and products by the Central America Tsunami Advisory Centre (CATAC), which started full functionality on the interim service on 17 January 2022 (CL-2894).

The ICG/PTWS, at its 29th session held online in December 2021, approved the conduct of an Exercise Pacific Wave 2022 (Pacwave22) live TSP Communications Test (13 October) and also agreed to promote that each Member State or regional group run a Pacific Wave Exercise between the 1 September and 30 November 2022 to support the International Disaster Risk Reduction Day (13 October) and World Tsunami Awareness Day (5 November). PacWave22 will be the tenth in a series of PacWave exercises which have been conducted biennially since 2006.

The Task Team on PacWave Exercises is responsible for overseeing the design, conduct and evaluation of Exercise Pacific Wave 2022. It is aware that in some countries the pandemic continues to be a relevant issue when planning and providing an adequate response to tsunami events. For this reason, it is important for each country to assess the implications of the pandemic in their NTWC and National Disaster Management Office (NDMO) and to take preventive measures, if necessary. The safety of the exercise participants and the coordinating team must be taken into consideration (see Annex III).

2. EXERCISE PURPOSE

PacWave22 intends to support the development of improved PTWS tsunami products and procedures, including the products from CATAC, the latter of which is hosted by the Instituto Nicaragüense de Estudios Territoriales (INETER).

Accordingly, the aim of PacWave22 is to test PTWS TSP arrangements, country preparedness arrangements and operational procedures to respond to and recover from a destructive tsunami.

PacWave22 provides a valuable opportunity for Pacific countries to engage regionally in coordination and cooperation, test new products (where relevant), review their tsunami response procedures, test internal and external communication systems, and engage with communities through public education activities. Regular exercises are important for maintaining staff readiness in case of a real event. This is especially true for tsunamis which are infrequent but require a rapid response when they occur. Every Pacific country is encouraged to participate.

3. EXERCISE OBJECTIVE

The objectives for Exercise PacWave 2022 are fourfold:

- (a) Test communications from the PTWS TSPs to the Tsunami Warning Focal Points (TWFP) and NTWCs of the Member States concerned.
- (b) Test national communication, cooperation, and readiness within each of the participating countries.
- (c) Test regional communication and cooperation between Member States and their respective TSPs.

- (d) Support the development of tsunami procedures and products by the CATAC, a potential new TSP (pending CATAC endorsement of full functionality by IOC Governing Bodies).

Each individual country may organize at its discretion additional PacWave22 activities in line with the four original objectives, and specifically to fulfill objectives (b) and (c). These activities could include:

- Conducting regional exercises organized and conducted through the relevant PTWS Regional Working Groups (where applicable) and with support from the PTWS TSPs and the ITIC, involving all PTWS countries.

Possible country exercise variations include:

- a. Consider conducting exercises for situations based on limitations derived from the COVID-19 pandemic, such as the absence of (a) warning center duty officer(s), requirements for virtual exercises, and/or evacuation/sheltering considering physical distancing practices of a pandemic.
- b. Consider conducting exercises in real time during daytime working hours with full staffing or simulating minimal staffing during nighttime or weekend hours.
- c. Consider testing countries' capability to carry out their warning and response responsibilities for the situation where one or more PTWS TSPs is not able to operate.
- d. Provide guidance in a timely manner.
- e. Consider conducting the exercise down to the community level, including where possible an extensive public awareness campaign.
- f. Consider the Sendai Framework for Disaster Risk Reduction seven global targets and four priorities for action, the World Tsunami Awareness Day and/or the UN Decade of Ocean Science for Sustainable Development in designing the exercise.

PacWave22 is overseen by the Task Team on PacWave Exercise [Terms of Reference enclosed and related information available at the exercise website (<http://www.pacwave.info>)].

4. TSUNAMI COASTAL ASSESSMENT TOOL (TsuCAT)

To help countries with their national tsunami exercises, the International Tsunami Information Centre and the Pacific Marine Environmental Laboratory (PMEL) of the National Oceanic and Atmospheric Administration (US NOAA) are making available **TsuCAT (Tsunami Coastal Assessment Tool)**. TsuCAT enables countries to choose their own scenario and to generate the PTWC's enhanced text and graphical products that they can then use to conduct their exercises.

TsuCAT provides access to a Pacific, Caribbean, and Indian Ocean database of tsunami modelling results from NOAA's pre-computed catalog of sources. For the Pacific and Caribbean, it also provides access to the RIFT model, to assist a country in its tsunami hazard assessment, tsunami exercise and response planning, and warning decision-making. It also includes simulations for historical tsunami sources from NOAA's National Center for Environmental Information (NCEI) and the U.S. Geological Survey (USGS) earthquake archive, as well as IOC expert meeting worst-case regional seismic tsunami scenarios. TsuCAT is an independent and 'stand-alone' platform, in that it runs on Windows, Apple, and Linux computing platforms and does not require Internet connectivity. All libraries, databases, and documentation are installed in their entirety on the host machine. The only requirement is a Java v1.8 or higher free installation.

Additional information and video demonstrations can be accessed from the PacWave22 website (www.pacwave.info) and the TsuCAT website (http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=2239&Itemid=2763).

TsuCAT v1 was introduced at the 27th session of the ICG/PTWS (ICG/PTWS-XXVII, Tahiti, French Polynesia, 28–31 March 2017), and subsequent versions were released at meetings and trainings to authoritative tsunami officials globally. Version 4.0 was distributed at the 28th session of the ICG/PTWS (ICG/PTWS-XXVIII, Barcelo Montelimar, Nicaragua 2–5 April 2019). Version 4.1 was distributed during ITIC Training Program classes in the Caribbean [Regional Standard Operating Procedures (SOPs), Barbados, July 2019] and Pacific (Papua New Guinea, September 2019; Hawaii, September 2019; Tonga, October 2019; Colombia, November 2019; Indonesia, January 2020).

The current version is TsuCAT v4.2 (October 2020), which includes improvements in the displays and exercise messages. It is available on request to agencies and authorities responsible for and supporting tsunami warning and mitigation in their countries. To request v4.2, please contact ITIC directly (ITIC Director, laura.kong@noaa.gov).

Introduction and help on how to use TsuCat v4.2 can be provided during the informational PacWave22 webinars which will be organized by ITIC and IOC on **13 September 2022, 0300 UTC in English and 1800 UTC primarily in Spanish**.

Connection details are available at the Webinar Meeting site and will be sent to all PTWS Tsunami National Contacts (TNCs) and TWFPs by email. Participants will be nominated at the discretion of each TNC and TWFP.

5. EXERCISE AND DATES

5.1 TSUNAMI SERVICE PROVIDER COMMUNICATIONS TEST

To test communications from the TSPs to each Member State, a live message will be issued for PacWave22. The live test will occur at **0000 UTC on 13 October 2022**. Member States should note of when and how they will receive the live communications test message and report back through the Post-Exercise Evaluation Form. The PacWave22 communication test evaluation form will be made available at https://www.surveymonkey.com/r/pacwave22_comm from 13 to 23 October 2022. **The form should be completed by 23 October 2022 at the latest.**

Dummy Exercise messages ([Annex I](#)) will be issued by the PTWS TSPs to Member State TWFPs and NTWCs.

The TSPs for the PTWS are:

- Pacific Tsunami Warning Center (PTWC, since 1965) hosted by US NOAA;
- Northwest Pacific Tsunami Advisory Center (NWPTAC, since 2006) hosted by JMA;
- South China Sea Tsunami Advisory Center (SCSTAC, since 2019) hosted by China's Ministry of Natural Resources;
- Central America Tsunami Advisory Centre (CATAC) hosted by Nicaragua. (As of 17th January 2022, it is operating at full functionality on the interim service for the Pacific coasts of Central America).

In addition to the communication test, **participating countries may choose to run their own exercises following PacWave22 objectives at any time between 1 September and 30 November 2022**, allowing flexibility to avoid conflict with other important national events.

For the regional and national exercises, a Post-Exercise evaluation form is available at https://www.surveymonkey.com/r/pacwave22_eval. **The form should be completed by 21st December 2022 at the latest.**

All information can be found on the PacWave22 website (<http://www.pacwave.info/>).

To answer questions related to the conduct of PacWave22, the ITIC and IOC will host PacWave22 informational webinars on 13 September 2022, at 0300 UTC and 1800 UTC. Participants should register through the Webinar meeting site. Connection details are available at the Webinar meeting site and will be sent to all PTWS TNCs and TWFPs via email.

PROVISIONAL TIMELINE AND MILESTONES

1 September 2022	Exercise Manual, published on www.pacwave.info
13 September 2022, 0300 UTC (English) 13 September 2022, 1800 UTC (Spanish)	PacWave22 Informational Webinar Meeting site: https://oceanexpert.org/event/3622 Zoom registration link (English): https://unesco-org.zoom.us/meeting/register/tZcqD-GtqDliG9UEAmHIB-KYbNKbyFjDOxKk Zoom registration link (Spanish): https://unesco-org.zoom.us/meeting/register/tZEufumorzotE9BEIlg3vem6gzO6Ew2jtbiHh
20 September 2022	Regional Working Groups inform TSP if products needed, copied to ITIC.
1 September–30 November 2022	PacWave22 Member State / regional activities
2 weeks before Regional Exercise	TSP products available on Regional Exercise web page
13 October 2022 (0000 UTC)	PacWave22 Live TSP Communications Test
23 October 2022	Deadline: Member States to complete and submit Pacwave22 Live TSP Communications Test results
30 November, 2022	Draft Live TSP Communications Test report
21 December 2022 at latest	Deadline: Member States to complete and submit PacWave22 Post-Exercise Evaluation Form (online)
28 February 2023	Draft PacWave22 Summary Report
30 April 2023	Final PacWave22 Summary Report published and posted at www.pacwave.info

5.2 REGIONAL AND NATIONAL EXERCISES

In addition to the communication test, each region and/or country will be responsible for designing its own regional, national, provincial and/or local level exercise(s) in line with the international Exercise Pacific Wave framework. The TsuCAT tool may be used to generate the PTWC text and enhanced products.

Optionally, you may choose to use a previous PacWave scenario; TSP message products for these scenarios are available on the ITIC International Tsunami Exercises – Pacific web pages.

Regional exercises are encouraged. For PacWave22, it is possible to exercise the PTWC Interim Procedures and PTWC products for a “Hunga Tonga–Hunga Ha’apai type” volcanic tsunami (CL-2992, User’s Guide, Version 1.3, 25 July 2022, and [CL-2877](#)).

Regional groups that would like to organise a joint exercise should contact the relevant TSP focal point, with copy to the ITIC, before 20 September 2022, and refer to the specific user guide for the different products.

TSUNAMI SERVICE PROVIDER POINTS OF CONTACT.

TSP	Point of contacts	E-mail
PTWC hosted by USA NOAA.	Dr Charles McCreery, PTWC, USA Dr Laura Kong, ITIC, USA Carolina Hincapie, ITIC, USA	charles.mccreery@noaa.gov laura.kong@noaa.gov carolina.hincapie@noaa.gov
NWPTAC hosted by Japan JMA.	Hosted by Mr. TAIRA Yutaro Senior Coordinator for International Earthquake and Tsunami Information, Japan Meteorological Agency Mr. NISHIMAE Yuji Senior Scientific Officer, Japan Meteorological Agency	taira@met.kishou.go.jp nishimae@met.kishou.go.jp
SCSTAC, since 2019 hosted by China MNR.	Mr. Lianda Zhao, Principal Oceanographer.	zld@nmefc.cn
CATAC hosted by Nicaragua INETER.	M.Sc. Emilio Talavera, Director de Sismología, Dirección General de Geología y Geofísica (INETER) Managua, Nicaragua Dr. Wilfred Strauss, Scientific advisor to the Nicaraguan Institute of Territorial Studies (INETER)	emilio.talavera@ineter.gob.ni wilfried.strauch@yahoo.com
ITIC	Carolina Hincapie, USA	carolina.hincapie@noaa.gov

The experience from the significant tsunami events in 2021-2022 strengthens the importance of regional coordination to address the challenges of a tsunami from any kind of source. Each region can explore ways to further develop their coordination during exercises, which could be through formal platforms such as emails, HF radio, dedicated regional websites for disseminations of messages or automated SMS, as well as through informal fast coordination channels including instant messaging, group chat rooms or mobile applications to simulate handheld transceivers. These informal coordination tools can be a valuable asset to address non-seismic or unprecedented events which do not comply with the requirements of the automated tools.

If necessary, each regional exercise is free to set up its own exercise evaluation form to complement the PacWave22 post-exercise evaluation form. The regional group will handle the post-exercises evaluation, including the compilation and assessment of the exercise, and share its final report to the PacWave22 Task Team.

KEY ACTIONS REGIONAL EXERCISE

DEADLINE	ACTIONS	RESPONSIBLE
1 September	Regional Working Groups inform TSP if products are needed, copied to ITIC	Regional Working Groups
2 weeks before Regional Exercise	TSP products available on Regional Exercise web page	TSP, ITIC

6. TYPE OF EXERCISE

For national exercises, it is recommended that, if possible, Exercise Pacific Wave 2022 be carried out as a functional exercise with community engagement or be conducted to include activities over and above a tabletop exercise.

Exercise Pacific Wave 2022 could be carried out in a drill format within communities or as a functional exercise. In a drill exercise, staff physically handle equipment or perform a specific procedure. The exercise usually has a time frame element and is used to test the procedures. An example of a drill exercise may involve activating an emergency operations centre or using alternative communications (such as radios).

A functional exercise may also be referred to as an 'operational' or a 'tactical' exercise. It takes place in an operational environment and requires participants to actually perform the functions of their roles. Participants interact within a simulated environment through an exercise control group that provides prewritten injects (e.g., emergency situation inputs) and responds to questions and tasks developing out of the exercise. Functional exercises normally involve multi-agency participation (real or simulated) and are used to practice multiple emergency functions, e.g. direction and control, resource management and communications. An example of a functional exercise is a multiple agency response to a tsunami threat, where evaluation of a coastal area is required. Messages and injects are provided by the exercise control group and are handled by participants as described in relevant plans and procedures. Outcomes are generated that would be expected in a real situation.

Finally, functional exercises that include a practice evacuation of communities or sectors of a community such as a school or other important facilities, are encouraged where possible. A school evacuation would test the procedures for receiving the warning and subsequent evacuation order, and the evacuation of school staff and school children to a designated tsunami safe area.

In a tabletop exercise, participants are presented with a situation or problem that they are required to discuss and for which they must formulate the appropriate response or solution. Normally, the exercise requires no simulation other than the scenario and/or prewritten exercise injects. An exercise controller or moderator introduces a simulated scenario to participants and, as the exercise advances (in time), exercise problems and activities (injects) are further introduced. This type of exercise is used to practice problem solving and

coordination of services with or without time pressures. There is no deployment or actual use of equipment or resources.

An example of a tabletop exercise may involve key stakeholders such as the NTWC and the NDMO in one country, and/or NTWCs from neighboring countries, discussing their response to a tsunami threat in a particular area, where the only injects are the tsunami products from the relevant TSPs.

7. FURTHER GUIDANCE

Manuals and guides described in this section are available on the PacWave22 website.

7.1 PLANS AND PROCEDURES FOR TSUNAMI WARNING AND EMERGENCY MANAGEMENT GUIDELINE

The IOC Manual and Guides entitled *Plans and procedures for tsunami warning and emergency management (IOC/2017/MG/76 Rev)* has been developed to provide guidance for countries on strengthening tsunami warning and emergency response through the development of plans and SOPs for their warning and emergency management authorities. National authorities should have aligned and robust tsunami warning and response plans and procedures to ensure timely, actionable warnings and effective response by coastal communities.

The Guideline is a product of collaboration between the four Intergovernmental Coordination Groups (ICGs) through the Working Group on Tsunamis and Other Hazards related to Sea-Level Warning and Mitigation Systems (TOWS-WG) and is a reference point for global consistency with regard to planning for and responding to tsunamis.

The content is based largely on training materials developed by the ICG/PTWS, the Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) and their respective Tsunami Information Centres, in particular the UNESCO/IOC-NOAA ITIC, based in Hawaii, USA. The content of the Guideline was developed through training workshops conducted in countries of the Indian Ocean, Southeast Asia and the South China Sea region between 2008 and 2010, as part of the project entitled "*Strengthening Tsunami Warning and Emergency Responses: Training Workshops on the Development of Standard Operating Procedures for Indian Ocean and Southeast Asian Countries*". It includes contributions from international experts in the fields of tsunami science, early warning and mitigation, disaster management and community awareness.

7.2 HOW TO PLAN, CONDUCT AND EVALUATE TSUNAMI EXERCISES GUIDELINE

The IOC Manual and Guides *How to plan, conduct and evaluate UNESCO/IOC tsunami wave exercises (IOC/2011/MG/58 Rev)*, English/Spanish, available on PacWave22 website) has been developed to aid countries in planning, conducting, and evaluating a tsunami exercise at a national and/or provincial level.

This guideline contains information on how to plan, conduct and evaluate tsunami wave exercises. It has been designed for use by IOC Member States who will participate in these exercises and has been divided into four easy stages to provide a range of practical advice and templates for in-country exercise developers to analyze the need for an exercise at the country, provincial or local level, and design, conduct, and evaluate the exercise. A number of case studies are included to provide examples of in-country tsunami exercises. The case study examples are not necessarily based on tsunami wave exercise scenarios, but they provide an insight into the planning and execution of national level tsunami exercises.

7.3 PREPARING FOR COMMUNITY TSUNAMI EVACUATIONS: FROM INUNDATION TO EVACUATION MAPS, RESPONSE PLANS, AND EXERCISES

The IOC Manual and Guides *Preparing for Community Tsunami Evacuations: from inundation to evacuation maps, response plans and exercises* (IOC/2020/MG/82, English/Spanish) has been developed to aid countries in preparing communities for the next tsunami. It consists of a guide presenting a high-level summary of each programme module and the rationale behind them, and two Supplements that contain additional detailed information, templates, references to specialized documents, tutorials and best practice examples (http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=2166&Itemid=2640).

This guide focuses on actions that communities can take to build resilience to the next tsunami. It affects actions with the end goal of saving lives and reducing tsunami impact by focusing on coordinated stakeholder response planning and preparedness, accompanied by continuous awareness on the end-to-end warning system to sustain advocacy. The actions and products of this guide—tsunami hazard assessments, inundation and evacuation maps, response plans and procedures, awareness, and exercises—assist communities in making themselves more prepared. The guide, formatted to support the training of people who are responsible for these deliverables, can be used as part of the process to become UNESCO/IOC Tsunami Ready, or simply to enhance preparedness.

7.4 INTERNATIONAL DAY FOR DISASTER REDUCTION AND WORLD TSUNAMI AWARENESS DAY

It will be useful to link your exercise and especially any community activities with either the **International Disaster Risk Reduction Day** on 13 October 2022, or the **World Tsunami Awareness Day** on 5 November 2022. Please note that a live communication test from TSPs to Member States will be conducted at 0000 UTC on 13 October 2022.

7.5 UNESCO/IOC TSUNAMI READY RECOGNITION PROGRAMME

The **Tsunami Ready Recognition Programme** is an international community-based recognition programme developed by the UNESCO/IOC. The main goal of the Programme is to improve coastal community preparedness for tsunamis and to minimize the loss of life, livelihood and property. This is achieved through a collaborative effort to meet a standard level of tsunami preparedness through the fulfilment of a set of established indicators. Refer to the IOC Manual and Guides *Standard Guidelines for the Tsunami Ready Recognition Programme UNESCO IOC* ([IOC/2022/MG/74, English](http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=2166&Itemid=2640)).

The United Nations declared on 5 December 2017 that a Decade of Ocean Science for Sustainable Development would be held from 2021 to 2030 (Ocean Decade). Five years later, in June 2022, the IOC Assembly approved the establishment of the IOC Ocean Decade Tsunami Programme where its implementation will be a key contribution to achieving the societal outcome 'A Safe Ocean' of the Ocean Decade.

The Tsunami Ready Recognition Programme is voluntary programme. Communities must meet all 12 indicators which cover assessment, preparedness, and response, to be recognized Tsunami Ready by the UNESCO/IOC. This recognition is renewable every four years but does not imply approval or confirmation that a community can or will perform at a certain level in the event of an actual tsunami. Tsunami Ready recognition does not mean that a community is tsunami proof; rather, it is an acknowledgement and recognition that a community has adopted mitigation measures to cope with their tsunami risk. For further information, PTWS Member States can contact International Tsunami Information Centre (Dr. Laura Kong,

laura.kong@noaa.gov), or visit the Tsunami Ready website (http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=2234&Itemid=2758).

8. ASSUMPTIONS

Each country will be responsible for determining what assumptions should be considered as part of its national, provincial, and/or local tsunami exercise (if conducted).

9. EXERCISE PARTICIPATION

All Pacific countries are strongly encouraged to participate in the exercise. At a minimum, to meet the objectives of PacWave22, it is recommended that the TWFP or NTWC participate.

Each country's lead agency will be responsible for the following:

- **During the initial phase of exercise planning:**
 - Determining their country's level of participation.
 - Planning their exercise through the country's Exercise Planning Team, including any regional or joint exercises.

Although participating countries will have advance notice of the exercise and may elect to stand up a special dedicated shift to allow normal core business to continue uninterrupted, it is requested that realistic resource levels be deployed in order to reflect some of the issues they are likely to be faced in a real event.

- **During the exercise:**
 - Participating in the live communication test between the TSP and Member States at 0000 UTC on 13 of October 2022.
 - Responding as necessary to fulfil their all-of-government and national, provincial and/or local arrangement obligations.
 - Responding as necessary to fulfil regional commitments.
- **After the exercise:**
 - Encouraging the conduct of debriefs and evaluations by in-country agencies, and/or country-country evaluation.
 - Completing both the PacWave22 Communication Test and Regional/National Exercise Evaluation forms based on in-country feedback.
 - Communication Test Form: https://www.surveymonkey.com/r/pacwave22_comm
 - Exercise Evaluation Form: https://www.surveymonkey.com/r/pacwave22_eval

10. EXERCISE DOCUMENTATION

All information related to Exercise Pacific Wave 2022 is available at the exercise website: <http://www.pacwave.info>

Exercise Pacific Wave 2022 planning, conduct, and evaluation should take into account the following documents:

- IOC Circular Letter 2894: Pacific Tsunami Warning and Mitigation System (PTWS) Exercise Pacific Wave 2022 (PacWave22), September–November 2022, including a live Tsunami Service Provided Communication Test on 13 October at 0000 UTC ([CL-2894](#)).
- Exercise Pacific Wave 2022. *A Pacific-wide Tsunami Warning and Communications Exercise, 13 October 2022. Volume 1: Exercise Manual*. Paris, UNESCO, IOC Technical Series No 175 (English only) (this document).
- *User's guide for the Pacific Tsunami Warning Center: enhanced products for the Pacific Tsunami Warning System*. Paris, UNESCO, IOC Technical Series No 105, Revised edition, 2014 (English; Spanish) ([IOC/2013/TS/105 Rev.3](#)).
- *Users' Guide for the Northwest Pacific Tsunami Advisory Center (NWPTAC): enhanced Products for the Pacific Tsunami Warning System*. Paris, UNESCO, IOC Technical Series No 142, 2019. (English) ([IOC/2019/TS/142](#)).
- *User's Guide for the South China Sea Tsunami Advisory Center (SCSTAC) products for the South China Sea Tsunami Warning and Mitigation System*. Paris, UNESCO, IOC Technical Series No 149, 2019. (English) ([IOC/2019/TS/149](#)).
- *Draft User's Guide for the Central American Tsunami Advisory Centre (CATAC)*, version 28 March 2019 (English, Spanish).
- *Operational users guide for the Pacific Tsunami Warning and Mitigation System (PTWS)*. Paris, UNESCO, IOC Technical Series No 87 rev., 2011. (English) ([IOC/2011/TS/87rev](#)).
- *Hunga Tonga–Hunga Ha`apai Volcanic Tsunami Hazard Response: PTWC Interim Procedures and PTWS Products – User's Guide*, Version 1.3, 25 July 2022 ([CL-2902](#))

Resources on the development of tsunami SOPs for warning and emergency response, including tsunami evacuation and the planning, conduct, and evaluation of exercises, include the following:

- *Plans and procedures for tsunami warning and emergency management*. Paris, UNESCO, IOC Manuals and Guides No. 76, 2017, 72 pp., English. ([IOC/2017/MG/76 Rev](#)).
- *How to plan, conduct and evaluate UNESCO/IOC tsunami wave exercises*. Paris, UNESCO, IOC Manuals and Guides No.58, 2013 (English, Spanish) ([IOC/2012/MG/58 Rev](#)).
- *Preparing for Community Tsunami Evacuations: from inundation to evacuation maps, response plans and exercises*. Paris, UNESCO, IOC Manuals and Guides No. 82, 2020 (English, Spanish) ([IOC/2020/MG/82](#)).
- *Standard Guidelines for the Tsunami Ready Recognition Programme*. Paris, UNESCO, IOC Manuals and Guides No. 74, 2022 (English) ([IOC/2022/MG/74](#))

11. EXERCISE PRODUCTS

One **Live TSP Communications Test** from the TSP to Member States' TWFPs and NTWCs **will take place at 0000 UTC on 13th October 2022**. The TSP Dummy Exercise messages that will be issued are provided in [Annex I](#).

Participating Member States should note the date, time, and method of receipt of the live communication test and report the finding in their Post-Exercise Evaluation Form.

For the CATAC regional exercise, please refer to the *Ejercicio Tsunami-CA-20* exercise manual for product details.

All documentation and correspondence relating to this exercise is to be clearly identified as **PacWave22** and **for exercise purposes only**.

12. EXERCISE DELIVERY/FORMAT

For the Live Communications Test at 0000 UTC on 13th October 2022, the PTWS TSP will issue an Exercise Dummy Message to each of the PTWS TWFPs and NTWCs through their usual methods of message communication.

13. POST-EXERCISE EVALUATION

All exercises should have a learning focus. Learning is maximized when there is a continuous process of review to draw out the lessons identified. Review is the process of evaluating and validating the exercise.

A review should evaluate the effectiveness of arrangements in place and identify if there are any corrective actions and gaps to fill. The hot and cold debriefs are then used to complete the Exercise Pacific Wave 2022 Post-Exercise Evaluation Form **divided in two parts with two different deadlines**.

All participating countries are asked to provide feedback through a PacWave22 Evaluation Form ([Annex II](#)) divided in two parts: the first part is dedicated to the evaluation of the TSP communications test and has to be completed by 23 October 2022, and the second form related to the exercise itself has to be completed by 21 December 2022. It is requested that each country compile evaluations from its jurisdictions and/or agencies and submit only **ONE (1) PacWave22 evaluation per country**.

The online PacWave22 Communication Test Evaluation Form will be made available at https://www.surveymonkey.com/r/pacwave22_comm from the 13 October 2022.

The online PacWave22 Post-Exercise Evaluation Form will be made available at https://www.surveymonkey.com/r/pacwave22_eval from the 1 September 2022.

This feedback will greatly assist in the evaluation of Exercise Pacific Wave 2022 and the testing of the CATAC Products.

13.1 DEBRIEFING

A post-exercise debrief is a critical review of the entire exercise. It identifies those areas that were handled well, those areas where issues were experienced, and recommendations for improvement.

The aim of organizational debriefing is for staff to communicate their experiences of the exercise so that lessons can be identified. Arrangements (plans, procedures, training, etc.) can then be modified to reflect lessons identified along with best practice, and therefore improve the agency's ability to respond during future exercises/real events.

Each agency that participates in PacWave22 is expected to conduct its own debriefs after the exercise. This may take the form of a hot debrief (or hotwash) on the day of the exercise, with each participating agency conducting its own cold (formal) debrief within the week(s) following the exercise.

A formal exercise debrief inclusive of all participants in the respective countries will be required to facilitate a collective and official evaluation. The method (in person meeting, survey, teleconference, or other means) used to collect the data required is to be decided upon by the individual participant countries.

The feedback received from this structured debrief is then used to complete standard evaluation forms which are to be based on the overall exercise objectives, plus any additional evaluation forms or tools developed by each country.

A useful guide to debriefing is the one used and published by the New Zealand Ministry of Civil Defence & Emergency Management (ISBN 0-478-25467-9). It can be found at:

<https://www.civildefence.govt.nz/assets/Uploads/publications/is-06-05-organisational-debriefing.pdf>

13.2 EXERCISE VALIDATION

The final stage of the exercise process is to determine whether the exercise has met its objectives. At the country level, a national exercise should compare the performance of the involved agencies during the exercise against the performance expected. After validation, countries and agencies may need to change or develop new plans, procedures, and training programmes. Exercise outcomes may be retested in future tsunami exercises, or new exercises written to meet newly identified needs.

13.3 EVALUATION CRITERIA

The key PacWave22 objectives are provided in **Section 3**. There will be three types of evaluation criteria. The first type will be international criteria (**Section 3**, objectives a, d). The second type will be criteria to be determined by each individual country to measure its own objectives (**Section 3**, objectives b, c). In compiling the Exercise Pacific Wave 2022 Summary Report, the Exercise Task Team will require **ONE (overall) evaluation form per participating country**.

13.4 EVALUATORS

Countries may appoint Exercise Evaluators to observe and evaluate selected objectives during their exercise. Evaluators should be subject matter experts in the field they are evaluating, such as in warning centre operations, emergency response, or in specific agency areas of responsibility.

Appointing and assigning evaluators is the responsibility of each participating country.

13.5 EVALUATION TOOLS

The goal of exercise evaluation is to validate strengths and identify opportunities for improvement within the participating organizations. This is to be accomplished by collating

supporting data; analyzing the data to compare effectiveness against requirements; and determining what changes need to be made by participating organizations. At the international level, this would involve the ICG/PTWS as the ICG supporting effective tsunami warning and decision making.

Evaluation of an exercise should focus on the adequacy of plans, policies, procedures, assessment capabilities, communication, resources and inter-agency/inter-jurisdictional relationships that support effective tsunami warning and decision-making at all levels of government. Participants that choose to include additional objectives, for example by exercising public warning and/or response plans, can expand the evaluation form accordingly. The evaluation of such additional objectives will only be for use by the specific participating agency and is not required for the PTWS Exercise Pacific Wave 2022 Summary Report.

The evaluation tool aims to inform and facilitate individual participant country evaluations as well as the Exercise Pacific Wave 2022 Summary Report.

All participating countries are asked to complete the official PacWave22 Post-Exercise Evaluation Form (**Annex II**) **by 21 December 2022**. Forms should be submitted online by visiting https://www.surveymonkey.com/r/pacwave22_eval

13.6 EXERCISE PACIFIC WAVE 2022 SUMMARY REPORT

The Exercise Task Team will compile the Exercise Pacific Wave 2022 Summary Report based on the official Post-Exercise Evaluation Forms received. The report will include the following:

- Exercise description,
- Post-exercise evaluation summary and findings,
- Identification of best practices or strengths,
- Identification of areas for improvement, and
- Recommendations on plans of action for improvement.

14. OBSERVERS

Exercise Pacific Wave 2022 may generate interest within the wider sector or local community. Visitors from other agencies (whether local or international) may be invited to observe various exercise activities. Media may also be invited to observe as a way of helping to increase tsunami awareness. Some media may also participate or be simulated, if they are part of the official warning and evacuation dissemination chain.

The invitation of internal or external agency personnel to observe the exercise is the responsibility of each participating country.

15. REAL EVENTS DURING EXERCISE PLAY

In the case of a real event occurring during the exercise, PTWC, NWPTAC, SCSTAC and CATAC will issue their normal message products for the event. Such messages will be given full priority and a decision will be made by each international centre whether to continue or cease their participation in the exercise. Smaller earthquakes that only trigger a Tsunami Information Statement will not disrupt the exercise.

Nationally, each country may suspend or terminate the exercise for their own reasons.

16. RESOURCES

All documents and tools are available through the PacWave website (<http://pacwave.info>).

Informational PacWave22 webinars will be organized by ITIC and IOC on 13 September 2022, 0300 UTC in English, and 1800 UTC primarily in Spanish, to provide further guidance on how to conduct exercises at different levels and also to open discussions between participants on best practices and experiences from past PacWave exercises. Connection details will be available at the Webinar meeting site <https://oceanexpert.org/event/3622>, and sent to all PTWS TNCs and TWFPs by email. Participants will be nominated at the discretion of each TNCs and TWFPs.

17. MEDIA ARRANGEMENTS

The UNESCO Division of Public Information / Sector for External Relations and Public Information will issue an international Media Advisory one week before the development of the Exercise Pacific Wave 2022 providing details of the exercise. ICG/PTWS Member States should consider issuing at least one press release to their respective country's media. Member States' press releases will give adequate alert to their country's population and give their local media time to conduct interviews and documentaries with participating exercise organizations in advance of the exercise.

Annex IV contains a sample press release that can be customized by Member States. The sample press release is provided in English.

ANNEX I

TSUNAMI SERVICE PROVIDER COMMUNICATIONS TEST MESSAGES

The following messages will be used by each approved Tsunami Service Providers (PTWC, NWPTAC, SCSTAC) and the interim Tsunami Service Provider (CATAC) for the Live Communications Test at 0000 UTC on 13 October 2022.

PACIFIC TSUNAMI WARNING CENTER (PTWC)

ZCZC

WEPA40 PHEB 130000

TSUPAC

TEST... DUMMY MESSAGE FOR PACWAVE22 EXERCISE...TEST

NWS PACIFIC TSUNAMI WARNING CENTER HONOLULU HI

0000 UTC THU OCT 13 2022

...THIS MESSAGE IS FOR TEST PURPOSES ONLY...

...TEST PACWAVE22 TSUNAMI EXERCISE TEST...

THIS IS A TEST. THIS MESSAGE IS BEING ISSUED AS A PART OF THE PACWAVE22 TSUNAMI EXERCISE. ITS PURPOSE IS TO TEST COMMUNICATIONS BETWEEN THE PACIFIC TSUNAMI WARNING CENTER AND THE TSUNAMI WARNING FOCAL POINTS AND NATIONAL TSUNAMI WARNING CENTERS OF THE COUNTRIES AND TERRITORIES THAT MAKE UP THE UNESCO-IOC PACIFIC TSUNAMI WARNING AND MITIGATION SYSTEM. THE MESSAGE IS BEING SENT OVER

- THE WMO GLOBAL TELECOMMUNICATIONS SYSTEM
- THE AERONAUTICAL FIXED TELECOMMUNICATIONS NETWORK
- THE EMERGENCY MANAGERS WEATHER INFORMATION NETWORK
- EMAIL
- TELEFAX
- AND OTHER SYSTEMS

THIS IS A TEST. PLEASE NOTE THE TIME AND MEANS OF ARRIVAL OF THIS MESSAGE FOR REPORTING IN THE POST-EXERCISE EVALUATION BEFORE 23 OCTOBER 2022.

NORTHWEST PACIFIC TSUNAMI ADVISORY CENTER (NWPTAC)

NWPTA COMMUNICATIONS TEST FOR EXERCISE PACIFIC WAVE 22

ISSUED BY NWPTAC (JMA)

ISSUED AT 0000Z 13 OCT 2022

PART 01 OF 01 PARTS

THIS IS A TEST MESSAGE FOR EXERCISE PACIFIC WAVE 22.

THIS MESSAGE IS FOR TEST PURPOSES ONLY.

THIS TEST MESSAGE HAS BEEN SENT TO EACH RECIPIENT ORGANIZATION
IN ORDER TO TEST RECEIPT OF NWPTAC MESSAGES AS PART OF EXERCISE
PACIFIC WAVE (PACWAVE) 22.

YOUR ACTION IS REQUIRED

PLEASE TAKE NOTE OF THE TIME YOU RECEIVE THIS MESSAGE AND THE METHOD(S)
BY WHICH YOU RECEIVE THIS MESSAGE AND REPORT BACK THROUGH THE EXERCISE
PACWAVE POST-EXERCISE ONLINE EVALUATION SURVEY BY 23 OCTOBER 2022.

=

SOUTH CHINA SEA TSUNAMI ADVISORY CENTER (SCSTAC)

WESS31 BABJ 130000

TEST PACWAVE22 TSUNAMI EXERCISE **TEST**

ISSUED BY SOUTH CHINA SEA TSUNAMI ADVISORY CENTER (SCSTAC)

ISSUED AT 0000Z 13 OCT 2022

THIS IS A COMMUNICATION TEST BULLETIN FOR PACWAVE22 TSUNAMI EXERCISE.

THIS IS A TEST TO VERIFY COMMUNICATION LINKS AND DETERMINE

TRANSMISSION TIMES INVOLVED IN THE DISSEMINATION OF OPERATIONAL

TSUNAMI ADVICE PRODUCTS FROM THE SOUTH CHINA SEA TSUNAMI ADVISORY

CENTER TO DESIGNATED 24-HOUR TSUNAMI WARNING FOCAL POINTS OF THE SOUTH

CHINA SEA TSUNAMI WARNING SYSTEM.

THIS TEST MESSAGE IS SENT BY GTS, FAX AND EMAIL.

RECIPIENTS ARE REQUESTED TO PLEASE RESPOND BACK TO ICG PTWS TASK TEAM

ON PACWAVE22. GUIDANCE FOR THE EXERCISE CAN BE FOUND IN

THE PACWAVE22 EXERCISE MANUAL LOCATED AT

WWW.PACWAVE.INFO

PLEASE RESPOND BEFORE THE DUE DATE SPECIFIED IN THE EXERCISE MANUAL.

THANK YOU FOR YOUR PARTICIPATION IN THIS COMMUNICATION TEST.

PLEASE TAKE NOTE OF THE TIME YOU RECEIVE THIS MESSAGE AND THE METHOD(S)
BY WHICH YOU RECEIVE THIS MESSAGE AND REPORT BACK THROUGH THE EXERCISE
PACWAVE POST-EXERCISE ONLINE EVALUATION SURVEY BY 23 OCTOBER 2022

CENTRAL AMERICA TSUNAMI ADVISORY CENTER (CATAC)

PRUEBA DE COMUNICACIONES CATAC PARA EL EJERCICIO PACIFIC WAVE 22

EMITIDO POR CATAC (INETER)

EMITIDO A LAS 0000Z 13 OCT 2022

ESTE ES UN MENSAJE DE PRUEBA PARA EL EJERCICIO PACIFIC WAVE 22.

ESTE MENSAJE ES PARA PRUEBAS ÚNICAMENTE.

ESTE MENSAJE DE PRUEBA SE HA ENVIADO A CADA ORGANIZACIÓN BENEFICIARIO PARA PROBAR LA RECEPCIÓN DE MENSAJES CATAC COMO PARTE DEL EJERCICIO PACIFIC WAVE (PACWAVE) 22.

SE REQUIERE SU ACCIÓN.

TENGA EN CUENTA LA HORA EN QUE RECIBE ESTE MENSAJE Y EL (LOS) MÉTODO (S) POR EL CUAL USTED RECIBE ESTE MENSAJE E INFORME A TRAVÉS DE LA ENCUESTA DE EVALUACIÓN EN LÍNEA POST-EJERCICIO DE PACWAVE22 A PARTIR DEL 23 DE OCTUBRE DE 2022.

ANNEX II

PACWAVE 2022 EVALUATION FORM

Post-Exercise Evaluation Forms are to be completed by each participating agency and forwarded to the country Exercise Pacific Wave 2022 National Contact, or the country Tsunami National Contact (TNC). **The PacWave22 National Contact will compile the country Post-Exercise Evaluation Form and complete and submit this online no later than 23 October 2022 for communication test and no later than 21 December 2022.**

Note: **Only ONE (1) on-line evaluation form is to be completed per country.** The PacWave22 National Contact, TNC, or Tsunami Warning Focal Point (TWFP) should compile sub-jurisdiction evaluations into one country evaluation to submit.

The PacWave22 Post-Exercise Evaluation Form is divided in two parts and can be found at:

Part 1 : Live TSP Communication test evaluation form:

Complete and submit before 23 October 2022

https://www.surveymonkey.com/r/pacwave22_comm

Part 2 : Post-Exercise evaluation form:

Complete and submit before 21 December 2022

https://www.surveymonkey.com/r/pacwave22_eval

Alternatively, the country evaluation forms can be submitted by email to the Exercise Pacific Wave 2022 Task Team Chairs:

- Margarita Martínez Obando (email: mmartinez@onemi.gov.cl), or
- Emilio Talavera (email: emilio.talavera@gf.ineter.gob.ni)

LIVE COMMUNICATION TEST FORM



EXERCISE PACIFIC WAVE 2022 (PacWave22) TSPs Communication Test / Post-Exercise Evaluation Form

INTRODUCTION

Thank you for participating in UNESCO/IOC's EXERCISE PACIFIC WAVE 2022!

Please take the time to thoughtfully complete the EXERCISE PACIFIC WAVE 2022 TSPs Communication Test / Post-Exercise Evaluation Form.

Your feedback is essential.

Glossary / Acronyms

AFTN	Aeronautical Fixed Telecommunication Network
CATAC	Central America Tsunami Advisory Centre
EMWIN	Emergency Managers Weather Information Network
GTS	Global Telecommunications System
ICG/PTWS	Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System
IOC	Intergovernmental Oceanographic Commission
NTWC	National Tsunami Warning Centre
NWPTAC	Northwest Pacific Tsunami Advisory Center
PTWC	Pacific Tsunami Warning Center
SCSTAC	South China Sea Tsunami Advisory Center
TNC	Tsunami National Contact
TSP	Tsunami Service Provider
TWFP	Tsunami Warning Focal Point
UNESCO	United Nations Educational, Scientific and Cultural Organization



EXERCISE PACIFIC WAVE 2022 (PacWave22) TSPs Communication Test / Post-Exercise Evaluation Form

INSTRUCTIONS

Prior to completing this Online Survey, please read these instructions carefully.

Post-Exercise Evaluation Forms are to be completed by each participating agency and forwarded to the country Exercise Pacific Wave 2022 National Contact, or the country Tsunami National Contact (TNC).

The National Contact will compile the country TSPs Communication Test / Post-Exercise Evaluation Form and complete and submit this online no later than 23 October 2022.

Note: Only ONE (1) on-line evaluation form is to be completed per country. The PacWave22 National Contact, TNC, or Tsunami Warning Focal Point (TWFP) should compile sub-jurisdiction evaluations into one country evaluation to submit.

If you have difficulty submitting your evaluation online, you may submit your Country Evaluation Form by email to Pacific Wave 2022 Task Team Chairs:

- Margarita Martínez Obando (email: mmartinez@onemi.gov.cl), or
- Emilio Talavera (email: emilio.talavera@gf.ineter.gob.ni)

EXERCISE PACIFIC WAVE 2022		
Instructions on how to Complete this Post-Exercise Evaluation Form		
STEP	WHO COMPLETES THIS STEP?	DESCRIPTION
1	Each participating Agency/Country	Decide if your agency/country will include additional evaluation questions for each objective. Country/agency evaluation questions can be added at the end of each section. However, do NOT change the reference numbers to the questions
2	Each participating Agency/Country	<p>Print this form and mark your evaluation answers on it.</p> <p>Answer questions only for the Objectives (activities) that your country participated in.</p> <p>Due to the COVID-19 pandemic, countries may not have conducted national or regional exercises, and therefore Objectives b) and c) would not have been addressed.</p> <p>Objective 1 (a) is the only requirement for PacWave22. Objective 4 (d) is required for those countries participating in the CATAAC regional exercise (pending to CATAAC endorsement confirmation by IOC 55th Executive Council).</p>
3	Each participating Agency/Country	<ul style="list-style-type: none"> • Answer each statement with either Y (Yes), N (No). • Comments should be used to explain/expand upon your Yes or No answer • Write your comments on the page following the evaluation questions. Note the question number in the left column and write your comments alongside.
4	Each participating Agency/Country	Send completed agency evaluation form to country PacWave22 National Contact so he/she can compile to complete Country PacWave22 TSPs Communication Test / Post-Exercise Evaluation Form (this URL).
5	PacWave22 National Contact	<p>PacWave22 National Contact should complete and submit the PacWave22 TSPs Communication Test / Post-Exercise Evaluation Form by 23 October 2022. (https://www.surveymonkey.com/r/pacwave22_comm)</p> <p>If there are problems or questions, please contact the PacWave22 Task Team co-Chairs: Margarita Martínez Obando, mmartinez@onemi.gob.cl or Emilio Talavera, emilio.talavera@gf.ineter.gob.ni</p>



EXERCISE PACIFIC WAVE 2022 (PacWave22) TSPs Communication Test / Post-Exercise Evaluation Form

CONTACT DETAILS

* Agency

* Country

* Contact Name

* Contact Position

* Contact Phone

* Contact Mobile

* Contact E-mail



EXERCISE PACIFIC WAVE 2022 (PacWave22) TSPs Communication Test / Post-Exercise Evaluation Form

OBJECTIVE 1 (Objective a)

Test communications from the approved and developing Tsunami Service Providers (PTWC, NWPTAC, SCSTAC, CATAAC) to Member States/Countries.

1.1 Did your country Tsunami Warning Focal Point receive the PTWC, NWPTAC, SCSTAC, and/or CATAAC Exercise Dummy message?

- Yes
- No

Comments

1.2 If yes, please select which Tsunami Service Provider you received the Exercise Dummy message from:

- PTWC
- NWPTAC
- SCSTAC
- CATAAC

Comments

1.3 If you received an Exercise Dummy message, when did you receive the message(s)? Please state the time in UTC:

PTWC	<input type="text"/>
NWPTAC	<input type="text"/>
SCSTAC	<input type="text"/>
CATAAC	<input type="text"/>

1.4 How did you receive the message(s)? Please tick methods.

- | | |
|--|--------------------------------|
| <input type="checkbox"/> GTS | <input type="checkbox"/> Fax |
| <input type="checkbox"/> APTN | <input type="checkbox"/> Email |
| <input type="checkbox"/> EMWIN | |
| <input type="checkbox"/> Other (Please specify): | |

1.5 Did all your country TWFPs receive the message(s) by the same methods?

- Yes
 No

If No, please indicate which one does not and method(s):

Objective 1 (Objective a) Comments

Please provide a general statement about **what went well**.



EXERCISE PACIFIC WAVE 2022 (PacWave22) TSPs Communication Test / Post-Exercise Evaluation Form

Thank you for completing the EXERCISE PACIFIC WAVE 2022 TSPs Communication Test / Post-Exercise Evaluation Form.

If you have further questions or need additional tsunami information, please do not hesitate to contact:
Bernardo Allaga (b.allaga@unesco.org), ICG/PTWS Technical Secretary
PacWave22 Chairs:
Margarita Martínez Obando (mmartinez@onemi.gov.cl)
Emilio Talavera (emilio.talavera@gf.ineter.gob.ni)



EXERCISE PACIFIC WAVE 2022 (PacWave22) TSPs Communication Test / Post-Exercise Evaluation Form

Click "Done" to submit your EXERCISE PACIFIC WAVE 2022 (PacWave22) TSPs Communication Test / Post-Exercise Evaluation Form

https://www.surveymonkey.com/r/pacwave22_comm

POST-EXERCICE EVALUATION FORM



EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication and Cooperation Post-Exercise Evaluation Form

INTRODUCTION

Thank you for participating in UNESCO/IOC's EXERCISE PACIFIC WAVE 2022!

Please take the time to thoughtfully complete the EXERCISE PACIFIC WAVE 2022 National/Regional Communication and Cooperation Post-Exercise Evaluation Form. Your feedback is essential.

Glossary / Acronyms

GATAC	Central America Tsunami Advisory Centre
Chatty Beetle	Portable iridium satellite terminals that can get text-based alerts and messaging in remote locations
ICG/PTWS	Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System
IOC	Intergovernmental Oceanographic Commission
NDMO	National Disaster Management Office
NTWC	National Tsunami Warning Centre
RSS	A web feed that allows users and applications to access updates to websites in a standardized, computer-readable format
SMS	Short Message Service
TNC	Tsunami National Contact
TsuCAT	Tsunami Coastal Assessment Tool
TWFP	Tsunami Warning Focal Point
UNESCO	United Nations Educational, Scientific and Cultural Organization



EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication and Cooperation Post-Exercise Evaluation Form

INSTRUCTIONS

Prior to completing this Online Survey, please read these instructions carefully.

Post-Exercise Evaluation Forms are to be completed by each participating agency and forwarded to the country Exercise Pacific Wave 2022 National Contact, or the country Tsunami National Contact (TNC).

The National Contact will compile the country National/Regional Communication and Cooperation Post-Exercise Evaluation Form and complete and submit this online no later than 21 December 2022.

Note: Only ONE (1) on-line evaluation form is to be completed per country. The PacWave22 National Contact, TNC, or Tsunami Warning Focal Point (TWFP) should compile sub-jurisdiction evaluations into one country evaluation to submit.

If you have difficulty submitting your evaluation online, you may submit your Country Evaluation Form by email to Pacific Wave 2022 Task Team Chairs:

- Margarita Martínez Obando (email: mmartinez@onemi.gov.cl), or
- Emilio Talavera (email: emilio.talavera@gf.ineter.gob.ni)

EXERCISE PACIFIC WAVE 2022		
Instructions on how to Complete this Post-Exercise Evaluation Form		
STEP	WHO COMPLETES THIS STEP?	DESCRIPTION
1	Each participating Agency/Country	Decide if your agency/country will include additional evaluation questions for each objective. Country/agency evaluation questions can be added at the end of each section. However, do NOT change the reference numbers to the questions.
2	Each participating Agency/Country	<p>Print this form and mark your evaluation answers on it.</p> <p>Answer questions only for the Objectives (activities) that your country participated in.</p> <p>Due to the COVID-19 pandemic, countries may not have conducted national or regional exercises, and therefore Objectives b) and c) would not have been addressed.</p> <p>Objective 1 (a) is the only requirement for PacWave22. Objective 4 (d) is required for those countries participating in the CATAAC regional exercise (pending to CATAAC endorsement confirmation by IOC 55th Executive Council).</p>
3	Each participating Agency/Country	<ul style="list-style-type: none"> • Answer each statement with either Y (Yes), N (No). • Comments should be used to explain/expand upon your Yes or No answer. • Write your comments on the page following the evaluation questions. Note the question number in the left column and write your comments alongside.
4	Each participating Agency/Country	Send completed agency evaluation form to country PacWave22 National Contact so he/she can compile to complete Country PacWave22 National/Regional Communication and Cooperation Post Exercise Evaluation Form (this URL).
5	PacWave22 National Contact	<p>PacWave22 National Contact should complete and submit the PacWave22 National/Regional Communication and Cooperation Post-Exercise Evaluation Form by 21 December 2022, (https://www.surveymonkey.com/r/pacwave22_eval)</p> <p>If there are problems or questions, please contact the PacWave22 Task Team co-Chairs: Margarita Martínez Obando, mmartinez@oasmi.gov.cl; or Emilio Talavera, emilio.talavera@gl.ineter.gob.ni</p>



EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication and Cooperation Post-Exercise Evaluation Form

CONTACT DETAILS

* Agency

* Country

* Contact Name

* Contact Position

* Contact Phone

* Contact Mobile

* Contact E-mail



EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication and Cooperation Post-Exercise Evaluation Form

OBJECTIVE 2 (Objective b)

Objective 2: To test national communication and cooperation, and readiness within the country.

Objective 2a: To test national communication and cooperation within the country.

2.1 The warning was disseminated to:

- | | |
|---|--|
| <input type="checkbox"/> Emergency services | <input type="checkbox"/> Local government: city/district level |
| <input type="checkbox"/> Other national government agencies | <input type="checkbox"/> Public |
| <input type="checkbox"/> Science agencies/universities involved in assessment | <input type="checkbox"/> Not Applicable |
| <input type="checkbox"/> Local government: provincial/regional level | |

Please list number of destinations:

2.2 What time was warning sent to the agency or agencies or Public listed in Q2.1? Please note the date and time using 24-hour clock and UTC, e.g., 5 Nov, 14:35 UTC.

2.3 How did you send the warning to emergency, national, science, and local government agencies in Q2.1? Tick all that apply.

- | | |
|--|--|
| <input type="checkbox"/> Landline Telephone | <input type="checkbox"/> Chatty Beetle |
| <input type="checkbox"/> Satellite Telephone | <input type="checkbox"/> TV |
| <input type="checkbox"/> Cell or Mobile Phone | <input type="checkbox"/> Website |
| <input type="checkbox"/> Fax | <input type="checkbox"/> Twitter |
| <input type="checkbox"/> Email | <input type="checkbox"/> Facebook |
| <input type="checkbox"/> SMS | <input type="checkbox"/> RSS |
| <input type="checkbox"/> Radio (UHF, VHF, Amateur) | |
| <input type="checkbox"/> Other (Please specify) | |

2.4 How did you send the warning to the Public? Tick all that apply.

- | | |
|--|---|
| <input type="checkbox"/> Landline Telephone | <input type="checkbox"/> Twitter |
| <input type="checkbox"/> Satellite Telephone | <input type="checkbox"/> Facebook |
| <input type="checkbox"/> Cell or Mobile Phone | <input type="checkbox"/> RSS |
| <input type="checkbox"/> Fax | <input type="checkbox"/> Sirens |
| <input type="checkbox"/> Email | <input type="checkbox"/> Public Announcement Systems (voice speakers) |
| <input type="checkbox"/> SMS | <input type="checkbox"/> Emergency cell / mobile phone broadcast |
| <input type="checkbox"/> Radio (UHF, VHF, Amateur) | <input type="checkbox"/> Police |
| <input type="checkbox"/> Chatty Beetle | <input type="checkbox"/> Door-to-door announcements |
| <input type="checkbox"/> TV | <input type="checkbox"/> Electronic billboards |
| <input type="checkbox"/> Website | |
| <input type="checkbox"/> Other (Please specify) | |

2.5 Based on feedback from agencies, were the communication methods timely and appropriate?

- Yes
 No

2.6 Based on feedback from agencies, were the message(s) disseminated from the NTWC/NDMO accurate and clear?

- Yes
 No

If No, please specify.

2.7 Did the national disaster management organisation (or equivalent) maintain communication with the National Tsunami Warning Centre throughout the event?

- Yes
 No

Comments

2.8 If you answered yes to Q2.7, what was the nature of the communication **between the national disaster management organisation** (or equivalent) with the **national tsunami warning centre** throughout the event?

Objective 2a Comments



EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication and Cooperation Post-Exercise Evaluation Form

Objective 2b

Objective 2: To test national communication and cooperation, and readiness within the country.

Objective 2b: To test national readiness within the country.

2.9 The NTWC/NDMO has an activation and response process (standard operating procedures) in place for the receipt of tsunami warnings?

- Yes
- No

2.10 The NTWC/NDMO knows its specific response role in the event of a tsunami?

- Yes
- No

2.11 The NTWC/NDMO has, prior to the exercise, engaged in tsunami response planning?

- Yes
- No

If Yes, please specify what kind of tsunami sources (Earthquakes, landslides, volcanic eruptions) are included in your response planning.

2.12 Since your last participation to PacWave, the NTWC/NDMO has undertaken activities to increase its capacity and capability to support a national tsunami response? (for example, training, exercise, etc.)

- Yes
- No

If Yes, list activities. If No, optional comments.

2.13 The NTWC/NDMO has an appropriate management structure identified and documented to support tsunami response?

- Yes
 No

2.14 The NTWC/NDMO has a national tsunami mass coastal evacuation plan?

- Yes
 No

2.15 Arrangements to assemble the in-country disaster management group relevant to decision-making on tsunami warning and response were in place before the exercise?

- Yes
 No

2.16 A country tsunami emergency response plan (standard operating procedures) for tsunamis exists? Tick all that apply.

- Local (less than 1 hour arrival time)
 Regional (1-3 hours arrival time)
 Distant (greater than 3 hours)

2.17 The response plan includes processes to issue Safe-to-Return (All-Clear) notices?

- Yes
 No

2.18 Tsunami exercises are routinely conducted in-country?

- Yes
 No

Please list last exercise, and type of exercise scenario (local, regional, distant).

2.19 Tsunami-related public education and awareness materials have been developed and disseminated?

- Yes
 No

2.20 Tsunami-related curriculum programmes are in place for all levels (pre, primary, secondary, post-secondary) of education?

- Yes
- No

If No, please list which levels have programmes.

2.21 All tsunami-vulnerable communities have tsunami evacuation maps, signage, and assembly points for evacuation?

- Yes
- No

If No, please list number of communities with maps and signage, gaps, and future plans to fill gaps.

2.22 What type of exercise did you conduct?

- Orientation
- Drill
- Tabletop
- Functional
- Full Scale
- Other (please specify)

2.23 Did you conduct community evacuation?

- Yes
- No

If Yes, what type?

- Schools
- Businesses
- Community
- Other (please specify)

2.24 If you answered yes to Q2.23, approximately how many people were evacuated in total?

2.25 Is your country implementing the UNESCO/IOC community-based Tsunami Ready Programme?

Yes

No

If Yes, how many communities are recognized and/or in process?
If No, is your country interested in implementing the Programme?

Objective 2b Comments



EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication and Cooperation Post-Exercise Evaluation Form

OBJECTIVE 3 (Objective c)

To test regional communication and cooperation.

3.1 Did your country engage in communication and cooperation with other countries in the region for PacWave22?

- Yes
- No

If yes, please list countries.

3.2 What types of cooperation were conducted?

- Data sharing (seismic, sea level, etc.)
- Event information sharing
- Alert coordination (levels, dissemination)
- Joint PacWave22 exercise
- Other (Please specify)

3.3 Did the National Tsunami Warning Center communicate with other countries during the event?

- Yes
- No

If Yes, please list countries.

3.4 Did the National Disaster Management Agency communicate with other countries during the event?

- Yes
 No

If Yes, please list countries. If No, optional comments.

3.5 Was national information shared with other countries during the event?

- Yes
 No

If Yes, please list.

3.6 What type of national information did you share? Tick all that apply.

- | | |
|--|---|
| <input type="checkbox"/> Seismic phase arrival times | <input type="checkbox"/> Tsunami Observations |
| <input type="checkbox"/> Earthquake hypocentre and/or magnitude | <input type="checkbox"/> Tsunami Evacuation |
| <input type="checkbox"/> Tsunami Alert Level (such as Warning, Cancellation, etc.) | <input type="checkbox"/> Tsunami Impact |
| <input type="checkbox"/> Tsunami Forecast | |
| <input type="checkbox"/> Other (Please specify) | |

3.7 How did you communicate the information?

- | | |
|--|--|
| <input type="checkbox"/> Radio (UHF, VHF, Amateur) | <input type="checkbox"/> Fax |
| <input type="checkbox"/> Landline Telephone | <input type="checkbox"/> Email |
| <input type="checkbox"/> Satellite Telephone | <input type="checkbox"/> SMS |
| <input type="checkbox"/> Cell or Mobile Phone | <input type="checkbox"/> Chatty Beetle |
| <input type="checkbox"/> Other (Please specify) | |

Objective 3 Comments

--



EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication and Cooperation Post-Exercise Evaluation Form

GENERAL EXERCISE OBSERVATIONS

Provide feedback on the planning and conduct of PacWave22.

Please also provide information on your country's exercise.

- Include electronic links to Media Coverage in Comments section.
- Send summaries, photos and videos directly to the PTWS Technical Secretary (Bernardo Aliaga, b.aliaga@unesco.org) and PacWave22 Chairs (Margarita Martínez Obando, mmartinez@onemi.gov.cl; Emilio Talavera, emilio.talavera@gf.ineter.gob.ni)

Evaluation Statements / Questions. Indicate Yes or No.

Overall assessment

	Yes	No
Country stakeholder agencies have a better understanding of the goals, responsibilities and roles in tsunami emergencies.	<input type="radio"/>	<input type="radio"/>
Gaps in capability and capacity have been identified.	<input type="radio"/>	<input type="radio"/>
Community have a better understanding of their tsunami risk and are better prepared for tsunami events.	<input type="radio"/>	<input type="radio"/>
News media participated and covered the exercise (Please provide electronic links if applicable in Comments).	<input type="radio"/>	<input type="radio"/>
How many people do you estimate participated in the exercise within your country/territory? Include both government and non-government agencies and public, if applicable.	<input type="radio"/>	<input type="radio"/>

Comments

Exercise planning (please make comment for each in the comments section)

	Yes	No
Overall, the exercise planning, conduct, format and style were satisfactory.	<input type="radio"/>	<input type="radio"/>
Exercise planning at the international level went well.	<input type="radio"/>	<input type="radio"/>
Exercise planning at the national level went well.	<input type="radio"/>	<input type="radio"/>
Exercise planning at the provincial/local level went well.	<input type="radio"/>	<input type="radio"/>
The PacWave22 exercise website pages were useful.	<input type="radio"/>	<input type="radio"/>
This evaluation form was easy to use.	<input type="radio"/>	<input type="radio"/>
PacWave22 Exercise Manual provided an appropriate level of detail.	<input type="radio"/>	<input type="radio"/>
IOC Manual & Guides 76: Plans and Procedures for Tsunami Warning and Emergency Management was useful.	<input type="radio"/>	<input type="radio"/>
IOC Manual & Guides 58: How to Plan, Conduct, and Evaluate IOC Tsunami Wave Exercises was useful.	<input type="radio"/>	<input type="radio"/>
IOC Manual & Guides 82: Preparing for Community Tsunami Evacuations: from inundation to evacuation maps, response plans and exercises was useful.	<input type="radio"/>	<input type="radio"/>
Tsunami Coastal Assessment Tool (TsuCAT) was used for exercise planning or hazard assessment.	<input type="radio"/>	<input type="radio"/>

Comments



EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication and Cooperation Post-Exercise Evaluation Form

EXERCISE PACIFIC WAVE 2022 EXPERIENCE

Please provide a general statement on your Exercise Pacific Wave 2022 experience.

Exercise Planning

Please provide a general statement about **what went well**.

Please provide a general statement about what did not go well.

Please provide a general statement about what could be improved.

Exercise Conduct

Please provide a general statement about what went well.

Please provide a general statement about what did not go well.

Please provide a general statement about what could be improved.

Exercise Debrief or Evaluation

Please provide a general statement about what went well.

Please provide a general statement about what did not go well.

Please provide a general statement about what could be improved.

Thank you for completing the EXERCISE PACIFIC WAVE 2022 Evaluation form.

If you have further questions or need additional tsunami information, please do not hesitate to contact:
Bernardo Allaga (b.allaga@unesco.org), IOC/PTWS Technical Secretary
PacWave22 Chairs:
Margarita Martinez Obando, mmartinez@onemi.gov.cl; or
Emilio Talavera, emilio.talavera@gf.meteor.gob.ni





unesco
Intergovernmental
Educational, Scientific
and Cultural
Organization

National Oceanic
and Atmospheric
Administration

Servicio Hidrográfico y
Oceanográfico de la
Armada de Chile

International
Tsunami Information
Center

**EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication
and Cooperation Post-Exercise Evaluation Form**

Click "Done" to submit your EXERCISE PACIFIC WAVE 2022 (PacWave22) National/Regional Communication and Cooperation Post-Exercise Evaluation Form.

https://www.surveymonkey.com/r/pacwave22_eval

ANNEX III

EVACUATION EXERCISES IN THE CONTEXT OF PANDEMIC

The Pacwave Task Team 2022 is aware that the pandemic remains a relevant issue for member countries. Thus, the team reviewed the World Health Organization recommendations and adapted the PACWAVE exercise to the current context.

- If your TSP and NMDO has COVID-19 safety recommendations that must be used in case of an emergency: We suggest checking these before the exercise and seeing if the same safety measures apply to the exercise that your team is currently planning.
- If the recommendations apply, when you are explaining the aim of the activity to the exercise participants, indicate that they must use existing COVID-19 safety recommendations within the organization as if it were a real emergency. Do this action as many times as necessary during the development of the exercise.

If not, please consider the following recommendations as a basis and adapt them to your organization and exercise:

- During the exercise, both participants and exercise coordinators must keep physical distance of at least 1 meter from each other, even if they do not appear to be sick. Avoid crowds and close contact. This is advice for both indoors and outdoors exercises.
- During the exercise, both participants and exercise coordinators should wear a properly fitted mask when physical distancing is not possible and in poorly ventilated settings. Be aware that in an exercise context, more people will be involved in the activity, such as exercise coordinators, observers, evaluators, or supervisors, thus it is important to not fill the rooms and exceed the capacity of people who should be in that space.
- It is recommended to use cameras and software that allows coordinator teams to livestream the exercise to observers and evaluators. During the day of the exercise, be aware that microphones should be turned on, and cameras should be placed properly. It is also recommended to record the exercise in order to improve observer and evaluator experience.
- During the exercise, both participants and exercise coordinators must clean their hands frequently with alcohol-based hand rub or soap and water.
- During the exercise, cover your mouth and nose with a bent elbow or tissue when you cough or sneeze. Dispose of used tissues immediately and clean hands regularly.
- If participants or exercise coordinators develop symptoms or test positive for COVID-19, it is important for them to self-isolate until they recover.
- If the exercise involves an invitation to the communities to practice their process to face a tsunami evacuation, it's important to promote the use of alcohol-based soap, masks, and other items in people's emergency evacuation kits in advance of the exercise.
- For evacuation exercises that involve communities, it is recommended that a media campaign be run before the exercise in order to inform people that they will participate in a drill. The campaign must include COVID-19 Safety measures.

ICG/PTWS issued specific guidance on **National and Local Tsunami Services and Evacuation/Sheltering Best Practices during COVID-19** that are available in English and Spanish for download from this website: http://www.ioc-tsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=26755

For further information please check <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>

ANNEX IV

SAMPLE PRESS RELEASE

TEMPLATE FOR NEWS RELEASE

USE AGENCY MASTHEAD

Contact: (insert name)

(insert phone number)

(insert email address)

FOR IMMEDIATE RELEASE

(insert date)

TENTH PACIFIC TSUNAMI EXERCISE SET FOR 13 OCTOBER 2022

(Insert country name) will join 46 countries around the Pacific Rim as a participant in a live tsunami exercise on 13 October 2022, International Disaster Risk Reduction Day and also support the World Tsunami Awareness Day on 5 November 2022. The purpose of this Pacific-wide exercise is to test communications from the UNESCO Intergovernmental Oceanographic Commission's Tsunami Service Providers (TSP) in the Pacific to every country's official tsunami warning authority. Exercise messages will be sent from the Pacific Tsunami Warning Center (PTWC) in Hawaii, USA, the Northwest Pacific Tsunami Advisory Center (NWPTAC) in Japan, the South China Sea Tsunami Advisory Center (SCSTAC) in China, and the developing Central America Tsunami Advisory Center (CATAC) in Nicaragua.

Tsunamis are no-notice, fast onset natural hazards that can cause catastrophic impacts. It is impossible to know when or where the next tsunami will hit, but we know that early warnings will save lives. For distant tsunamis, the Tsunami Service Providers provide timely alerts to country National Tsunami Warning Centres who evaluate their own tsunami threat and issue tsunami warnings to their coastal communities. And for local tsunamis, continuous education is essential so that everyone self-evacuates upon recognizing nature's natural tsunami warnings. If people do not evacuate in time, thousands of lives will be lost and massive losses incurred that will have long lasting humanitarian, social and economic impacts.

" insert quote " said (insert name of appropriate official).

The exercise, titled Exercise Pacific Wave 2022 (PacWave22), will ensure that the communications system to officially alert countries of the Pacific Tsunami Warning and Mitigation System is working. It is the tenth such exercise with the first having been carried out in 2006, and subsequent exercises held in 2008, 2011, 2013, 2015, 2016, 2017, 2018 and 2020.

Insert paragraph tailored for specific country. Could identify participating agencies and specific plans. Could describe current early warning program, past evacuation drills (if any), ongoing mitigation and public education programs, etc. Could describe tsunami threat, history of tsunami hazards, if any.

The exercise is sponsored by UNESCO's Intergovernmental Oceanographic Commission through its Intergovernmental Coordination Group of the Pacific Tsunami Warning and Mitigation System (ICG/PTWS).###

On the Web:

Exercise Pacific Wave 2022 information site: <http://www.pacwave.info>

Media Resources, International Tsunami Information Centre

http://itic.ioc-unesco.org/index.php?option=com_content&view=category&layout=blog&id=1150&Itemid=1150

Pacific Tsunami Warning and Mitigation System:

http://www.ioc-tsunami.org/index.php?option=com_content&view=article&id=11&Itemid=12&lang=en

Pacific Tsunami Warning Center: <http://www.tsunami.gov>

Northwest Pacific Tsunami Advisory Center:

<http://www.data.jma.go.jp/svd/eqev/data/nwptac/index.html>

South China Sea Tsunami Advisory Center: <http://scstac.oceanguide.org.cn/index.htm>

Central America Tsunami Advisory Center: <http://catac.ineter.gob.ni/>

[Insert country URLs]

ANNEX V

LIST OF ACRONYMS

CATAC	Central America Tsunami Advisory Centre
CL	Circular Letter
DISCEX	Discussion Exercise or Tabletop Exercise
ICG	Intergovernmental Coordination Group
ICG/IOTWMS	Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System
ICG/ITSU	International Coordination Group for the Tsunami Warning System in the Pacific (now renamed ICG/PTWS)
ICG/PTWS	The Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System
INETER	Instituto Nicaragüense de Estudios Territoriales
IOC	Intergovernmental Oceanographic Commission of UNESCO
ITIC	International Tsunami Information Center
JMA	Japan Meteorological Agency
MNR	China Ministry of Natural Resources
MTS	Medium-term Strategy
NCEI	National Centers for Environmental Information
NDMO	National Disaster Management Offices
NOAA	US National Oceanic and Atmospheric Administration
NTWC	National Tsunami Warning Centre
NWPTAC	Northwest Pacific Tsunami Advisory Center
PacWave	Exercise Pacific Wave
PMEL	Pacific Marine Environmental Laboratory
PTWC	Pacific Tsunami Warning Center
PTWS	Pacific Tsunami Warning and Mitigation System
SCSTAC	South China Sea Tsunami Advisory Center
SOP	Standard Operating Procedure

TOWS-WG	IOC Working Group on Tsunamis and Other Hazards related to Sea-Level Warning and Mitigation Systems
TSP	Tsunami Service Provider
TsuCAT	Tsunami Coastal Assessment Tool
TNCs	Tsunami National Contacts
TT	Task Team
TWFP	Tsunami Warning Focal Point
UNESCO	United Nations Educational, Scientific and Cultural Organization
USGS	U.S. Geological Survey

IOC Technical Series

No.	Title	Languages
1	Manual on International Oceanographic Data Exchange. 1965	(out of stock)
2	Intergovernmental Oceanographic Commission (Five years of work). 1966	(out of stock)
3	Radio Communication Requirements of Oceanography. 1967	(out of stock)
4	Manual on International Oceanographic Data Exchange - Second revised edition. 1967	(out of stock)
5	Legal Problems Associated with Ocean Data Acquisition Systems (ODAS). 1969	(out of stock)
6	Perspectives in Oceanography, 1968	(out of stock)
7	Comprehensive Outline of the Scope of the Long-term and Expanded Programme of Oceanic Exploration and Research. 1970	(out of stock)
8	IGOSS (Integrated Global Ocean Station System) - General Plan Implementation Programme for Phase I. 1971	(out of stock)
9	Manual on International Oceanographic Data Exchange - Third Revised Edition. 1973	(out of stock)
10	Bruun Memorial Lectures, 1971	E, F, S, R
11	Bruun Memorial Lectures, 1973	(out of stock)
12	Oceanographic Products and Methods of Analysis and Prediction. 1977	E only
13	International Decade of Ocean Exploration (IDOE), 1971-1980. 1974	(out of stock)
14	A Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment and Baseline Study Guidelines. 1976	E, F, S, R
15	Bruun Memorial Lectures, 1975 - Co-operative Study of the Kuroshio and Adjacent Regions. 1976	(out of stock)
16	Integrated Ocean Global Station System (IGOSS) General Plan and Implementation Programme 1977-1982. 1977	E, F, S, R
17	Oceanographic Components of the Global Atmospheric Research Programme (GARP) . 1977	(out of stock)
18	Global Ocean Pollution: An Overview. 1977	(out of stock)
19	Bruun Memorial Lectures - The Importance and Application of Satellite and Remotely Sensed Data to Oceanography. 1977	(out of stock)
20	A Focus for Ocean Research: The Intergovernmental Oceanographic Commission - History, Functions, Achievements. 1979	(out of stock)
21	Bruun Memorial Lectures, 1979: Marine Environment and Ocean Resources. 1986	E, F, S, R
22	Scientific Report of the Intercalibration Exercise of the IOC-WMO-UNEP Pilot Project on Monitoring Background Levels of Selected Pollutants in Open Ocean Waters. 1982	(out of stock)
23	Operational Sea-Level Stations. 1983	E, F, S, R
24	Time-Series of Ocean Measurements. Vol.1. 1983	E, F, S, R
25	A Framework for the Implementation of the Comprehensive Plan for the Global Investigation of Pollution in the Marine Environment. 1984	(out of stock)
26	The Determination of Polychlorinated Biphenyls in Open-ocean Waters. 1984	E only
27	Ocean Observing System Development Programme. 1984	E, F, S, R
28	Bruun Memorial Lectures, 1982: Ocean Science for the Year 2000. 1984	E, F, S, R
29	Catalogue of Tide Gauges in the Pacific. 1985	E only
30	Time-Series of Ocean Measurements. Vol. 2. 1984	E only
31	Time-Series of Ocean Measurements. Vol. 3. 1986	E only
32	Summary of Radiometric Ages from the Pacific. 1987	E only
33	Time-Series of Ocean Measurements. Vol. 4. 1988	E only
34	Bruun Memorial Lectures, 1987: Recent Advances in Selected Areas of Ocean Sciences in the Regions of the Caribbean, Indian Ocean and the Western Pacific. 1988	Composite E, F, S
35	Global Sea-Level Observing System (GLOSS) Implementation Plan. 1990	E only

(continued)

36	Bruun Memorial Lectures 1989: Impact of New Technology on Marine Scientific Research. 1991	Composite E, F, S
37	Tsunami Glossary - A Glossary of Terms and Acronyms Used in the Tsunami Literature. 1991	E only
38	The Oceans and Climate: A Guide to Present Needs. 1991	E only
39	Bruun Memorial Lectures, 1991: Modelling and Prediction in Marine Science. 1992	E only
40	Oceanic Interdecadal Climate Variability. 1992	E only
41	Marine Debris: Solid Waste Management Action for the Wider Caribbean. 1994	E only
42	Calculation of New Depth Equations for Expendable Bathymetographs Using a Temperature-Error-Free Method (Application to Sippican/TSK T-7, T-6 and T-4 XBTS. 1994	E only
43	IGOSS Plan and Implementation Programme 1996-2003. 1996	E, F, S, R
44	Design and Implementation of some Harmful Algal Monitoring Systems. 1996	E only
45	Use of Standards and Reference Materials in the Measurement of Chlorinated Hydrocarbon Residues. 1996	E only
46	Equatorial Segment of the Mid-Atlantic Ridge. 1996	E only
47	Peace in the Oceans: Ocean Governance and the Agenda for Peace; the Proceedings of <i>Pacem in Maribus</i> XXIII, Costa Rica, 1995. 1997	E only
48	Neotectonics and fluid flow through seafloor sediments in the Eastern Mediterranean and Black Seas - Parts I and II. 1997	E only
49	Global Temperature Salinity Profile Programme: Overview and Future. 1998	E only
50	Global Sea-Level Observing System (GLOSS) Implementation Plan-1997. 1997	E only
51	L'état actuel de l'exploitation des pêcheries maritimes au Cameroun et leur gestion intégrée dans la sous-région du Golfe de Guinée (<i>cancelled</i>)	F only
52	Cold water carbonate mounds and sediment transport on the Northeast Atlantic Margin. 1998	E only
53	The Baltic Floating University: Training Through Research in the Baltic, Barents and White Seas - 1997. 1998	E only
54	Geological Processes on the Northeast Atlantic Margin (8 th training-through-research cruise, June-August 1998). 1999	E only
55	Bruun Memorial Lectures, 1999: Ocean Predictability. 2000	E only
56	Multidisciplinary Study of Geological Processes on the North East Atlantic and Western Mediterranean Margins (9 th training-through-research cruise, June-July 1999). 2000	E only
57	Ad hoc Benthic Indicator Group - Results of Initial Planning Meeting, Paris, France, 6-9 December 1999. 2000	E only
58	Bruun Memorial Lectures, 2001: Operational Oceanography – a perspective from the private sector. 2001	E only
59	Monitoring and Management Strategies for Harmful Algal Blooms in Coastal Waters. 2001	E only
60	Interdisciplinary Approaches to Geoscience on the North East Atlantic Margin and Mid-Atlantic Ridge (10 th training-through-research cruise, July-August 2000). 2001	E only
61	Forecasting Ocean Science? Pros and Cons, Potsdam Lecture, 1999. 2002	E only
62	Geological Processes in the Mediterranean and Black Seas and North East Atlantic (11 th training-through-research cruise, July- September 2001). 2002	E only
63	Improved Global Bathymetry – Final Report of SCOR Working Group 107. 2002	E only
64	R. Revelle Memorial Lecture, 2006: Global Sea Levels, Past, Present and Future. 2007	E only
65	Bruun Memorial Lectures, 2003: Gas Hydrates – a potential source of energy from the oceans. 2003	E only
66	Bruun Memorial Lectures, 2003: Energy from the Sea: the potential and realities of Ocean Thermal Energy Conversion (OTEC). 2003	E only

67	Interdisciplinary Geoscience Research on the North East Atlantic Margin, Mediterranean Sea and Mid-Atlantic Ridge (12 th training-through-research cruise, June-August 2002). 2003	E only
68	Interdisciplinary Studies of North Atlantic and Labrador Sea Margin Architecture and Sedimentary Processes (13 th training-through-research cruise, July-September 2003). 2004	E only
69	Biodiversity and Distribution of the Megafauna / Biodiversité et distribution de la mégafaune. 2006 Vol.1 The polymetallic nodule ecosystem of the Eastern Equatorial Pacific Ocean / Ecosystème de nodules polymétalliques de l'océan Pacifique Est équatorial Vol.2 Annotated photographic Atlas of the echinoderms of the Clarion-Clipperton fracture zone / Atlas photographique annoté des échinodermes de la zone de fractures de Clarion et de Clipperton Vol.3 Options for the management and conservation of the biodiversity — The nodule ecosystem in the Clarion Clipperton fracture zone: scientific, legal and institutional aspects	E F
70	Interdisciplinary geoscience studies of the Gulf of Cadiz and Western Mediterranean Basin (14 th training-through-research cruise, July-September 2004). 2006	E only
71	Indian Ocean Tsunami Warning and Mitigation System, IOTWS. Implementation Plan, 7–9 April 2009 (2 nd Revision). 2009	E only
72	Deep-water Cold Seeps, Sedimentary Environments and Ecosystems of the Black and Tyrrhenian Seas and the Gulf of Cadiz (15 th training-through-research cruise, June–August 2005). 2007	E only
73	Implementation Plan for the Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS), 2007–2011. 2007 (<i>electronic only</i>)	E only
74	Bruun Memorial Lectures, 2005: The Ecology and Oceanography of Harmful Algal Blooms – Multidisciplinary approaches to research and management. 2007	E only
75	National Ocean Policy. The Basic Texts from: Australia, Brazil, Canada, China, Colombia, Japan, Norway, Portugal, Russian Federation, United States of America. (Also Law of Sea Dossier 1). 2008	E only
76	Deep-water Depositional Systems and Cold Seeps of the Western Mediterranean, Gulf of Cadiz and Norwegian Continental margins (16 th training-through-research cruise, May–July 2006). 2008	E only
77	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – 12 September 2007 Indian Ocean Tsunami Event. Post-Event Assessment of IOTWS Performance. 2008	E only
78	Tsunami and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions (CARIBE EWS) – Implementation Plan 2013–2017 (Version 2.0). 2013	E only
79	Filling Gaps in Large Marine Ecosystem Nitrogen Loadings Forecast for 64 LMEs – GEF/LME global project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	E only
80	Models of the World's Large Marine Ecosystems. GEF/LME Global Project Promoting Ecosystem-based Approaches to Fisheries Conservation and Large Marine Ecosystems. 2008	E only
81	Indian Ocean Tsunami Warning and Mitigation System (IOTWS) – Implementation Plan for Regional Tsunami Watch Providers (RTWP). 2008	E only
82	Exercise Pacific Wave 08 – A Pacific-wide Tsunami Warning and Communication Exercise, 28–30 October 2008. 2008	E only
83.	<i>Cancelled</i>	
84.	Global Open Oceans and Deep Seabed (GOODS) Bio-geographic Classification. 2009	E only
85.	Tsunami Glossary	E, F, S
86	Pacific Tsunami Warning System (PTWS) Implementation Plan	<i>Electronic publication</i>

(continued)

87.	Operational Users Guide for the Pacific Tsunami Warning and Mitigation System (PTWS) – Second Edition. 2011	E only
88.	Exercise Indian Ocean Wave 2009 (IOWave09) – An Indian Ocean-wide Tsunami Warning and Communication Exercise – 14 October 2009. 2009	E only
89.	Ship-based Repeat Hydrography: A Strategy for a Sustained Global Programme. 2009	E only
90.	12 January 2010 Haiti Earthquake and Tsunami Event Post-Event Assessment of CARIBE EWS Performance. 2010	E only
91.	Compendium of Definitions and Terminology on Hazards, Disasters, Vulnerability and Risks in a coastal context	<i>Under preparation</i>
92.	27 February 2010 Chile Earthquake and Tsunami Event – Post-Event Assessment of PTWS Performance (Pacific Tsunami Warning System). 2010	E only
93.	Exercise CARIBE WAVE 11 / LANTEX 11—A Caribbean Tsunami Warning Exercise, 23 March 2011	
	Vol. 1 Participant Handbook / Exercice CARIBE WAVE 11 —Exercice d’alerte au tsunami dans les Caraïbes, 23 mars 2011. Manuel du participant / Ejercicio Caribe Wave 11. Un ejercicio de alerta de tsunami en el Caribe, 23 de marzo de 2011. Manual del participante. 2010	E/F/S
	Vol. 2 Report. 2011	E only
	Vol. 3 Supplement: Media Reports. 2011	E/F/S
94.	Cold seeps, coral mounds and deep-water depositional systems of the Alboran Sea, Gulf of Cadiz and Norwegian continental margin (17th training-through-research cruise, June–July 2008)	E only
95.	International Post-Tsunami Survey for the 25 October 2010 Mentawai, Indonesia Tsunami	E only
96.	Pacific Tsunami Warning System (PTWS) 11 March 2011 Off Pacific coast of Tohoku, Japan, Earthquake and Tsunami Event. Post-Event Assessment of PTWS Performance	E only
97.	Exercise PACIFIC WAVE 11: A Pacific-wide Tsunami Warning and Communication Exercise, 9–10 November 2011	
	Vol. 1 Exercise Manual. 2011	E only
	Vol. 2 Report. 2013	E only
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