The 31st Session of the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System (ICG/PTWS - XXXI), 7 – 11 April 2025, Beijing

National Reports will be posted to the ICG/PTWS-XXXI website without TWFP contact details

NATIONAL REPORT

Submitted by Australia

BASIC INFORMATION

(FILL IN SECTIONS 1-3 ONLY IF THERE IS A NEED TO COMMUNICATE OFFICIAL UPDATES.)

1. ICG/PTWS Tsunami National Contact (TNC)

The person designated by a Member State to an Intergovernmental Coordination Group (ICG) to represent his/her country in the coordination of international tsunami warning and mitigation activities. The person is part of the main stakeholders of the national tsunami warning and mitigation system. The person may be the Tsunami Warning Focal Point, from the national disaster management organization, from a technical or scientific institution, or from another agency with tsunami warning and mitigation responsibilities.

Name:
Title:
Organization:
Postal Address:
E-mail Address:
Telephone Number:
Fax Number:
Cellular Telephone Number:

2. ICG/PTWS Tsunami Warning Focal Point (TWFP)

A 24 x 7 point of contact (office, operational unit or position, not a person) officially designated by the NTWC or the government to receive and disseminate tsunami information from an ICG Tsunami Service Provider according to established National Standard Operating Procedures. The TWFP may or not be the NTWC.

TWFP Agency name:
(if different from NTWC agency)
TWFP Agency Contact or Officer in Charge *(if different from NTWC Agency):*
Name:
Position:
Telephone Number:
Email Address:
Postal Address:

TWFP 24x7 point of contact (office, operational unit or position**, not a person**):

Name of office, operational unit or position:
E-mail Address:
Telephone Number:
Cellular phone number:
Fax:

National Tsunami Warning Centre (if different from the above)

A centre officially designated by the government to monitor and issue tsunami warnings and other related statements within their country according to established National Standard Operating Procedures

NTWC Agency Name:
NTWC Agency Contact or Officer in Charge (person):
Name:
Position:
Telephone Number:
Email address:
Postal Address:

3. Tsunami Advisor(s), if applicable
(Person, Committee or Agency managing Tsunami Mitigation in country)
Name:
Title:
Postal Address:
E-mail Address:
Emergency Telephone Number:
Emergency Fax Number:
Emergency Cellular Telephone Number:

4. Tsunami Standard Operating Procedures for a Local Tsunami (when a local tsunami hazard exists)
No separate procedures in place for local tsunami.
- The risk to a local tsunami from earthquake is low in Australia apart from offshore islands such as Macquarie Island and Cocos Islands near the fault lines.
- There is risk of local tsunami from undersea landslides, particularly along the east coast.

5. Tsunami Standard Operating Procedures for a Distant Tsunami (when a distant tsunami hazard exists)
For each situation, please provide the following:

- *What organization identifies and characterizes tsunamigenic events?*

  The Joint Australian Tsunami Warning Centre (JATWC). It is a partnership between Geoscience Australia (GA) and the Bureau of Meteorology.
  - Geoscience Australia monitors and analyses earthquakes and provides the Bureau of Meteorology manually verified solutions for follow-up tsunami assessment.
  - Bureau of Meteorology utilises the solutions from Geoscience Australia to assess tsunami threat to Australia and Indian Ocean countries.
  - On behalf of JATWC, the Bureau then issues appropriate tsunami warnings to Australia and provides threat information to 27 Indian Ocean National Tsunami Warning Centres through JATWC's role as a regional Tsunami Service Provider for the Indian Ocean Tsunami Warning & Mitigation System (IOTWMS).
  - For non-seismic volcanically caused tsunami event, the Volcanic Ash Advisory Centres (VAACs) of Melbourne and Wellington (through VAAC Melbourne) could provide the critical information about whether stratospheric intrusion from those satellite ash cloud imageries, as precursor for tsunami.

- *What is the threshold or criteria for declaring a potential tsunami emergency?*

  Using the MOST tsunami propagation model, thresholds for the 95th percentile of grid points within forecast zones were tuned against known impacts from tsunami events since 1960 and inundation models for the land threat threshold.

The resulting thresholds based on the 95 percentile modelled deep water value (i.e., offshore) are

- No Threat < 20 cm (< 10cm for offshore islands), approximately equivalent to <40cm near shore
- Marine Threat 20 - 55 cm (10 - 50 cm for offshore islands), approximately equivalent to 40cm - 1m near shore
- Land Threat > 55cm (> 50cm for offshore islands), approximately equivalent to > 1m near shore

It's important to note that decision making for JATWC to issue a tsunami warning is solely based on deep-water thresholds, rather than beach value predictions.

- *What organization acts on the information provided by the agency responsible for characterizing the potential tsunami threat?*

  - Emergency management agencies of State and Territory Governments act on the JATWC warnings. They have the formal jurisdiction and responsibility in their respective state or territory for emergency response. Outside an event, they are also responsible for community preparedness.
  - The National Emergency Management Agency (NEMA) monitors the unfolding situation and coordinates federal assistance to affected States and Territories.
  - Surf Life Saving Australia coordinates responses by local surf life-saving clubs, such as closing beaches to swimming. This is a particularly important role for Marine Threat warnings.

- *How is the tsunami information (warning, public safety action, etc) disseminated within country? Who is it disseminated to?*

  JATWC issues tsunami warnings, which also quote action statements as pre-agreed with the responsible emergency authorities

  - to public via the JATWC website, BoM Mobile App, X(Twitter), 1300 TSUNAMI Phone service.
  - to registered users via ftp including machine ingestible format of CAP and XML.
  - to emergency services, media and other stakeholders via email, sms or fax (to be phased out)

  State/Territory emergency services issue public safety advices via Emergency Alert and posting on their websites.

- *How is the emergency situation terminated?*

  The JATWC will issue a warning cancellation when it assesses that either no tsunami has eventuated or the tsunami threat has passed. In the latter case, the observed wave impacts must be below the Marine Threat level for at least two hours or up to at least 6 hours for larger earthquakes, although abnormal sea level changes and currents may persist for hours or days after cancellation.

  The All Clear advice about when it's safe to return to coastal areas is not issued by the JATWC, but by the State/Territory emergency management authorities who have jurisdictional responsibility for public safety and response to any tsunami impacts.

- *For Distant Tsunami Procedures:*

  What actions were taken in response to tsunami bulletins issued by PTWC, NWPTAC, and/or SCSTAC during the intersessional period?

For information only. JATWC provides its own independent tsunami assessment.

The earthquake information provided in bulletins of PTWC and NWPTAC could be used as a business continuity/back up measure in case Geoscience Australia is inoperable (never happened).

Bulletins of PTWC and NWPTAC are used by JATWC to brief relevant government entities if there is a significant tsunami threat to Pacific countries.

6. National Sea Level Network

Please include a table with position and description of stations/sensors, and a map.

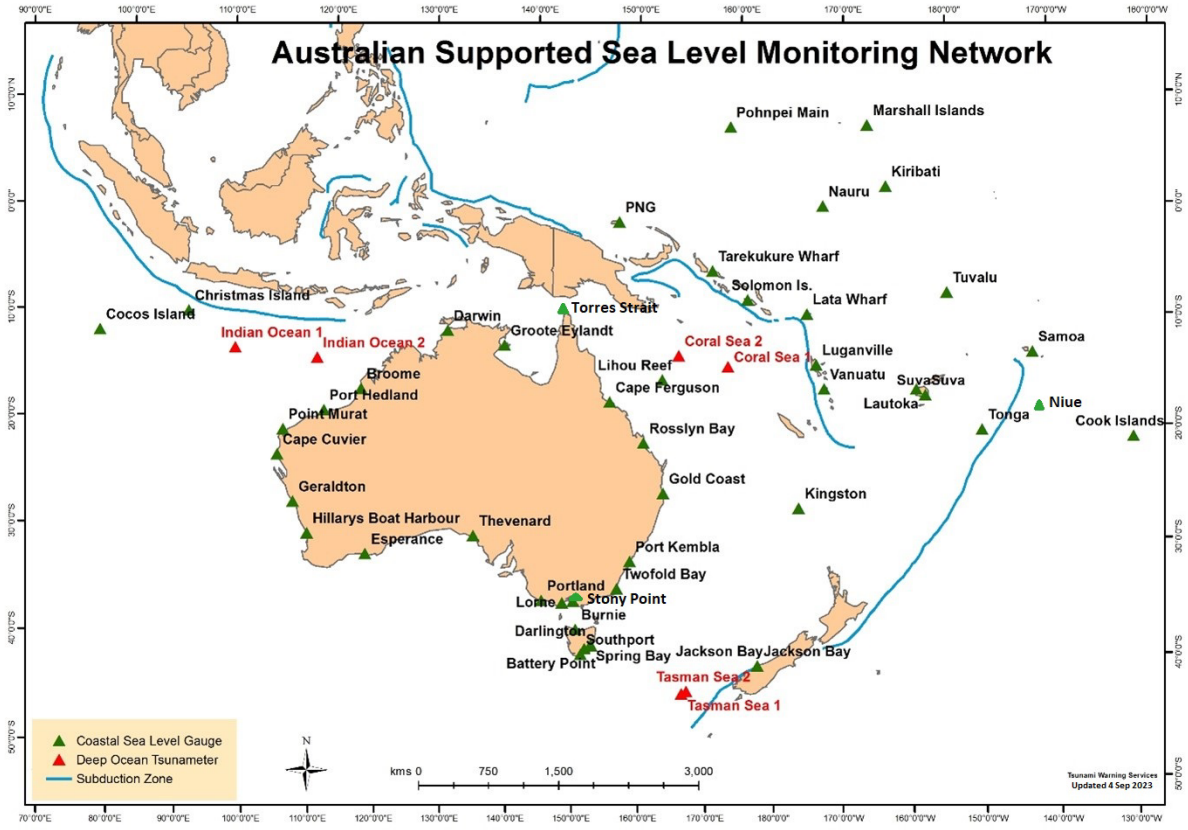

***Table 1**: Australian Coastal Sea Level Stations as at 4 March 2025 (*radar type gauges)*

Location	Latitude	Longitude	Date Commissioned	GTS 1 min
Australian Mainland				
Groote Eylandt	-13.86	136.42	Sep 1993; currently not functioning	
Darwin	-12.47	130.85	May 1990	√
Broome	-18.01	122.22	Nov 1991; decommissioned and replaced by a new station nearby on 13 Feb 2025	√
Hillarys	-31.85	115.74	Nov 1991	√

Location	Latitude	Longitude	Date Commissioned	GTS 1 min
Esperance	-33.87	121.90	Mar 1992	√
Thevenard	-32.15	133.64	May 1992	√
Geraldton	-28.75	114.59	New	
Portland	-38.34	141.61	Jul 1991	√
Lihou Reef Lighthouse	-17.13	152.15		√
Burnie	-41.05	145.91	Sep 1992	√
Spring Bay	-42.55	147.93	May 1991	√
Port Kembla	-34.47	150.91	Jul 1991	√
Rosslyn Bay	-23.16	150.79	Jun 1992	√
Cape Ferguson	-19.28	147.06	Sep 1991	√
Point Murat *	-21.82	114.19	Dec 2007	√
Cape Cuvier *	-24.22	113.40	Nov 2008	√
Battery Point *	-42.89	147.34	Mar 2009	√
Southport *	-43.43	146.97	Jun 2009	√
Two Fold Bay *	-37.10	149.93	Jun 2009	√
Gold Coast *	-27.94	153.43	Jun 2009	√
Stony Point	-38.37	145.22	n/a	
Torres Strait	-10.59	142.22	Nov 2014	√
Indian Ocean				
Cocos Islands	-12.12	96.90	Sep 1992	√
Christmas Island I	-10.43	105.67	Dec 2006	√
Christmas Island II *	-10.43	105.67	Jul 2009	
Pacific Ocean				
Lautoka, Fiji	-17.60	177.43	Oct 1992	√
Suva, Fiji	-18.13	178.43	Oct 1992	√
Tarawa, Kiribati	1.35	172.91	Dec 1992	√
Port Vila, Vanuatu	-17.75	168.28	Jan 1993	√
Nuku'Alofa, Tonga	-21.13	175.2	June 2018	√
Rarotonga, Cook Is	-21.2	200.23	Feb 1993	√
Apia, Samoa	-13.82	188.25	Feb 1993	√
Funafuti, Tuvalu	-8.38	179.21	Mar 1993	√
Majuro, Marshall Islands	7.11	171.37	May 1993	√
Nauru	-0.53	166.9	Jul 1993	√
Honiara, Solomon Is	-9.43	159.95	Jul 1994	√
Lombrum- Manus Is	-2.03	147.36	Sep 1994	√
Jackson Bay, NZ *	-43.97	168.62	Jul 1996	√
Pohnpei, FSM	6.98	158.20	Dec 2001	√
Luganville, Vanuatu *	-15.52	167.19	Dec 2007	√
Kingston, Norfolk Is *	-29.06	167.96	Aug 2009	√
Choisuel, Solomon Is *	-6.69	156.41	May 2010	√
Lata, Solomon Is *	-10.72	165.80	May 2010	√
Niue	-19.05	-169.9	Sep 2023	√

***Table 2**: Australian Deep Ocean Tsunami Stations (Tsunameters) as 4 March 2025*

Location	Latitude	Longitude	Established	Status
Indian Ocean				

Indian Ocean 1	-12.32	108.51	Oct 2008	Buoy adrift. Mission to restore planned
Indian Ocean 2	-15.02	117.99	Oct 2008	OK
Coral Sea				
Coral Sea 1	-15.43	158.28	Apr 2008	OK
Coral Sea 2	-14.72	153.54	Sep 2009	OK
Tasman Sea				
Tasman Sea 1	-44.90	161.77	Feb 2007	Intermittent data, a restoration mission planned for May 2025
Tasman Sea 2	-44.90	161.77	Apr 2011	OK. Newly replaced in Feb 2025

7. Information on Tsunami occurrences

Please include sea level observations, pictures, wave arrival descriptions, public, media, or other responses to warnings, lessons learned, etc.

Recent tsunami events experienced in Australia are

- HTHH Volcanic eruption of 15 January 2022. Marine Warning issued for Norfolk Island, three hours after the eruption, later upgraded to Land Warning, Marine Warning also issued for Lord Howe Island and later upgraded to Land Warning with local emergency service ordered evacuation which took place overnight. Marine Warning was also issued for most of the Australian east coast. These warnings verified well against many sea level observations.

- M7.9 Kermadec Islands of 05 March 2021. Timely Marine Warning issued for Norfolk Island and verified well against observations. Below threat waves also observed along east coast of Australia.

- M7.6 Loyalty Islands of 11 February 2021. Timely Marine Warning issued for Lord Howe Island and verified well against observations. No evacuation required but communities self evacuated on the island. Below threat waves also observed along east coast of Australia.

8. Web sites (URLs) of national tsunami-related web sites

Description	Website Address
Joint Australian Tsunami Warning Centre	http://www.bom.gov.au/tsunami/
Indian Ocean Warning Status TSP Australia	http://www.bom.gov.au/tsunami/iotwms
Geoscience Australia – Earthquake Information	http://www.ga.gov.au/earthquakes/
Australian Tsunami Warning System	http://www.bom.gov.au/tsunami/about/atws.shtml
Tsunami: The Ultimate Guide	https://knowledge.aidr.org.au/resources/the-ultimate-guide-tsunami/#/

9. Summary plans of future tsunami warning and mitigation system improvements.

Tsunami Risk Assessment

The 2018 update of the national Probabilistic Tsunami Hazard Assessment (PTHA) by Geoscience Australia has been used by the State and Territory emergency management agencies to prioritise areas for more detailed tsunami inundation assessments.

Enhanced Seismic Monitoring

Geoscience Australia (GA) will integrate, test and operationalise seismic array processing as input to rapid earthquake detection and characterization.

It also commenced work towards ISO 9001 accreditation for GA-JATWC systems.

Enhanced Sea Level Monitoring

Efforts are continuing at the Bureau of Meteorology to sustain the core networks of coastal sea level stations and deep ocean tsunami detection DART buoys. This included the latest restoration of a Tasman Sea DART station in Feb 2025, and a plan to restore the other non-functional DART station in the same region by May 2025.

Enhanced Tsunami Warning

The Bureau's underpinning tsunami warning decision tool has been replaced by a global community of practice tool called TOAST together with a more robust and secure information and communication technology infrastructure.

The JATWC has developed capability to deliver NAVAREA maritime products.

Community Awareness and Preparedness

The national tsunami coordination body of the Australian Tsunami Advisory Group (ATAG) are implementing the 3-year workplan of 2022-25, emphasising the importance of exercising the end-to-end tsunami warning system and building community tsunami awareness and preparedness.

NATIONAL PROGRAMMES AND ACTIVITIES INFORMATION

10. EXECUTIVE SUMMARY

Please provide a brief statement of no more than one page addressing all items discussed in the Narrative section of the National Report (below)

The Joint Australian Tsunami Warning Centre (JATWC), operated by the Bureau of Meteorology and Geoscience Australia, is the national authority for providing tsunami warnings to Australia and its offshore territories. The JATWC is also a designated Tsunami Service Provider (TSP) for the Indian Ocean Tsunami Warning & Mitigation System (IOTWMS), providing tsunami threat information for 27 Indian Ocean countries. Australia, through the Bureau of Meteorology, has continued to provide over AUD$400,000 per year and accommodation support to the UNESCO/IOC in support of the Secretariat Office of the ICG/IOTWMS at the Bureau’s Regional Office in Perth, Western Australia.

Australia participated in two international exercises of IOWave23 and PacWave24.

Australia continues to operate its own national seismic and sea level monitoring networks, making all data freely available to all other countries. A new tsunami Decision Support System called TOAST is also implemented at the Bureau of Meteorology. The Bureau's tsunami warning services

have been enhanced through a major transformation of the operating model and was recertified by an independent auditing agency for another three years to 2026 for operating an ISO 9001 compliant quality management system.

Australia continues to undertake national and local scale risk assessments, community preparedness evaluation and tsunami research aimed at the ongoing improvement of the Australian Tsunami Warning System (ATWS).

……

11. NARRATIVE

Detailed description of innovations or modifications to National tsunami warnings procedures or operations since last National Report, tsunami research projects, tsunami mitigation activities and best practices (especially in preparedness and emergency management), tsunami exercises, as well as public education programmes or other measures taken to heighten awareness of the tsunami hazard and risk.

Improvements to the JATWC systems and procedures

The Bureau of Meteorology implemented a new system called TOAST to transform the key decision supporting tool underpinning the JATWC tsunami operations.

The Bureau's successful enterprise-wide transformation of the Bureau public service offering has greatly enhanced the agility and resilience of tsunami operations.

The quality managed tsunami warning services through such a major transformation has been recertified by an independent auditing agency for another three years to 2026 for complying with the international ISO 9001 standards.

Tsunami research projects, tsunami mitigation activities and best practices

The Department of Fire and Emergency Services, Western Australia (WA), together with Geoscience Australia, are working on the WA Tsunami Inundation Modelling Project. This project is developing regional-scale tsunami evacuation maps informed by high-resolution tsunami inundation modelling. The study area is from the Midwest WA (Geraldton) to the South West WA (Dunsborough), including the Greater Perth area. The project deliverables are:
- Completion of tsunami inundation modelling
- Compile historical tsunami information, impacts and experiences
- Develop spatial tools to identify exposure and vulnerability for the selected areas
- Develop recommendations to update and amend state tsunami plans and procedures
- Develop the WA State Tsunami Awareness Guide
- Develop a communications strategy for tsunami awareness promotion

University of Newcastle completed a study into the potential for submarine landslide inundation off the Queensland Coast (inundation modelling from Noosa to Gold Coast)

Queensland (QLD) Department of Environment, Science and Innovation has conducted detailed inundation modelling for a subset of scenarios from the PTHA at the Sunshine Coast, Moreton Bay, Hervey Bay and Gold Coast.
QLD released the Tsunami Guide for Queensland in 2019 and updated version in 2024 (www.disaster.qld.gov.au)

QLD included tsunami in the 2023 State Disaster Risk Report (www.disaster.qld.gov.au)

Tsunami Exercises and Communications Tests

Indian Ocean Communications Tests

Australia has assisted in the organisation and conduct of the half-yearly IOTWMS communications tests since early 2011. Australia participates as both an IOTWMS Tsunami Service Provider and as a National Tsunami Warning Centre. Australia also assists the ICG/IOTWMS Secretariat in the preparation of the official manuals and reports for the tests.

Exercise IOWave23
The IOWave23 exercise took place over a three-week period during the 4th to the 25th of October 2023. It ran four scenarios in real time simulating Indian Ocean countries being put in a tsunami warning situation and requiring National Tsunami Warning Centres, Disaster Management Offices, and other relevant authorities in each country to activate their SOPs.

Three of the scenarios simulated tsunamis generated by approximate magnitude 9 earthquakes originating in the Andaman, Makran and Java trenches. In addition, due to tsunamis generated by the recent 2018 Anak Krakatau and 2022 Hung Tonga-Hunga Ha'apai eruptions, the IOWave23 exercise was the first IOWAVE exercise that tested the response to a tsunami generated by a non-seismic tsunami source generated by a volcanic eruption at Heard Island.

Australian participation in IOWave23 focused on the Java Trench scenario as a functional exercise with a large turnout of all affected States and Territories. For the non-seismic scenario, Western Australia conducted a local tabletop discussion exercise.

In all four scenarios, the Joint Australian Tsunami Warning Centre (JATWC) exercised its role as a Tsunami Service Provider (TSP) for the IOTWMS.

Exercise Pacwave24
The Australian PacWave24 national exercise took place on 23 October 2024. The scenario began with a magnitude (M) 8.6 Puysegur Trench earthquake at 0000 UTC, which was later upgraded to M9.1.

The JATWC produced simulated tsunami warnings in real-time, which were disseminated to participating agencies throughout the day.

A list on those participating agencies and what they conducted:

National Agencies

- The National Emergency Management Agency (NEMA) conducted a limited functional exercise with assistance from embedded Bureau staff.
- The Bureau's media team collaborated with external agencies to prepare talking points and social media posts. Bureau staff embedded within emergency management agencies coordinated information from partners back to the Bureau via an exercise video chat.
- The Australian Maritime Safety Authority (AMSA) conducted a hybrid functional/desktop exercise with their NAVAREA X Coordinator to verify inter agency message distribution paths and produce appropriate navigational warnings for affected coastal areas and high seas.
- The Australian Broadcasting Corporation (ABC) Emergency team conducted a hybrid functional and desktop exercise to test internal workflows and their response to an event with national impact. In liaison with media units from the Bureau, NSW State Emergency Service (NSW SES), GA and Surf Life Saving NSW (SLSNSW), the ABC exercised collaboration to develop mock social media posts, talking points, and action statements for the public.
- The Australian Antarctic Division (AAD) participated as an observer of the working relationships between stakeholders.
- SLS Australia observed the event as they are an administrative body. However, SLS agencies from each of the affected states participated in various capacities.

State and Territory Agencies

- Queensland Police Service (QPS) conducted a fully functional exercise, testing several aspects of their operational procedures, ingestion of Bureau warning products and communication with participating agencies.
- Victoria State Emergency Service (VIC SES) participated functionally and exercised the activation of their public information function. VIC SES engaged with two Regional Emergency Management Committees (REMCs), while the regional teams participated in a tabletop exercise.
- NSW SES participated in a fully functional capacity with several internal teams being stood up. Their teams exercised media messaging processes in coordination with other agencies' media units. Operational staff exercised issuing Emergency Alerts and warning products (in line with the Australian Warning System) and the use of HazardWatch.
- Tasmanian Police (TasPol) conducted a desktop exercise with support from the Tasmanian State Emergency Service (TAS SES) and the Bureau. They tested communication with partner agencies, frontline police and traffic management, as well as evacuation decisions for coastal communities.
- The Tasmanian Department of State Growth participated as an observer to evaluate the efficacy of notification processes from TasPol to key entities such as Tasmanian Ports (TasPorts).
- Norfolk Island Emergency Management observed the exercise.
- Surf Life Saving QLD (SLSQ) participated in a tabletop exercise to assess the requirements of SLSQ in the case of a tsunami threat. Additionally, SLSQ aimed to look at current processes and communication channels to ensure they are fit for purpose.
- Surf Life Saving NSW (SLSNSW) conducted a hybrid desktop and functional exercise. The aim was to test SLSNSW State Operations Centre Tsunami processes, communications, and to familiarised with the Bureau's new TOAST warning system.
- Surf Life Saving Victoria conducted a discussion exercise.
- Surf Life Saving Tasmania participated in a tabletop capacity to ensure that changes implemented from a previous tsunami exercises have been embedded and are fit for purpose.

The JATWC participated in the regional exercise organised by the Pacific Island Countries and Territories (PICT) to test regional communication and cooperation during a tsunami event. This exercise took place on the 4th of November 2024, at 2300 UTC.

Australia also participated in two international communication tests for PacWave24 on 5 November 2024.

- One occurred at 0000 UTC when the JATWC received a dummy product each from the Pacific Tsunami Warning Centre (PTWC) and the Japan Meteorological Agency (JMA), both as regional tsunami service providers.
- The other occurred at 0001 UTC when PTWC issued a dummy regional maritime safety product to concerned National Tsunami Warning Centres and Navigational areas (NAVAREA) Coordinators. From Australia, the JATWC and the Australian Maritime Safety Authority (AMSA) as NAVAREA X Coordinator participated.

……

Date: ……4 March 2025…….. Name: ……Piero Chessa……..