



Working Group 2 Tsunami Detection, Warning and Dissemination

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Outline of Presentation

- Terms of Reference (ToR)-WG2**
- Membership**
- Key Activity Updates since last ICG Intersessional / SC19 / WG2 meetings**
- IOTWMS COMMS Tests**
- TOWS-WG / TT-TWO**
- IOC Meeting Updates**

Term of References (ToR) – WG 2

Liaise with other working group(s) and task team(s) within the ICG/IOTWMS and with working groups from the other ocean basins through the TOWS-WG to:

1. Coordinate and strengthen the operational implementation **of tsunami detection, warning and dissemination, including for tsunamis generated by non-seismic and complex sources, and multi-hazard framework.**
2. Support the **Tsunami Service Providers (TSPs)** delivery of interoperable regional tsunami threat information products to Member States.
3. Support **Member States in the development of their national tsunami warning capabilities.**
4. Monitor the **performance of key observational, warning and communication system components.**
5. Support **implementation of IOWave Exercises.**
6. Identify **areas of priority for action following assessments, communications tests, exercises, and real tsunami events.**
7. Provide **advice to and collaborate with the UNESCO-IOC Indian Ocean Tsunami Information Centre (IOTIC)** on capacity development on warning system and services including for non-seismic and complex sources.
8. Provide **special attention to the needs of SIDS, LDCs, Africa** in the work program.
9. Develop **WG2 work plans in line with the broad objectives of ODTP RDIP, Ocean Decade Challenge 6, EW4ALL.**
10. In collaboration with UNESCO-IOC IOTIC and UNESCO-IOC Secretariat for ICG/IOTWMS, help **strengthen the capacity and capability of Member States.**

Membership

Members: (from 9 Member States)

1. Mr. J. Padmanabham , Chair, India
2. Dr Robert Greenwood, Vice-Chair ,Australia
3. Dr Yedi Dermadi Vice Chair, Indonesia
4. Ms Adrienne Moseley -Australia
5. Mr M Nagaraja Kumar - India
6. Dr Wijayanto -Indonesia
7. Mr Iman Fatchurochman -Indonesia
8. Mr Januar Arifin -Indonesia
9. Mr Bayu Pranata -Indonesia
10. Mr Mohd Robi Amri -Indonesia
11. Dr Endang Widjiati -Indonesia
12. Dr Chai Mui Fatt -Malaysia
13. Mr Nik Mohd Riduan Nik Osman -Malaysia
14. Mr Mat Kamarulzaman Mat Adam -Malaysia
15. Dr Yin Myo Min Htwe -Myanmar
16. Ms Moza Al Marhoobi -Oman
17. Mr Anjum Nazir Zaigham -Pakistan
18. Ms Rose Soy -Seychelles
19. Mr Badr Alameri -UAE
20. Ms Shamma Alneyadi -UAE

Dr. Wahyu Widodo Pandoe, Indonesia

Chair Sub-Task Team on New and Emerging Technologies

UNESCO-IOC

1. Dr. Srinivasa Kumar Tummala - IOTWMS Secretariat
2. Ms Nora GALE – IOTWMS Secretariat
3. Mr.Ardito M. KODIJAT – IOTIC

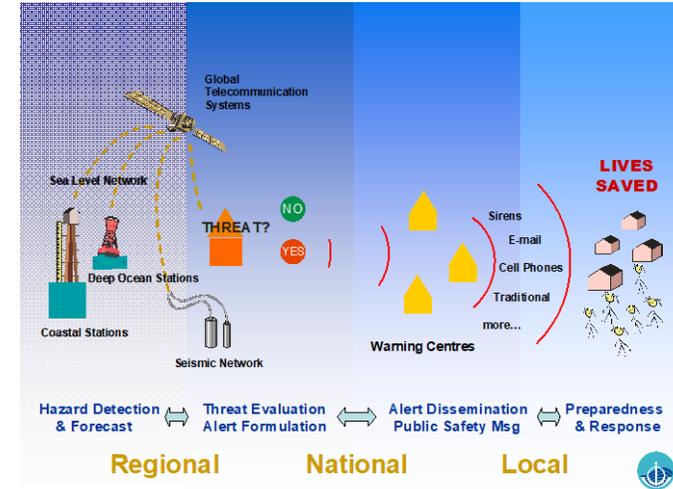
Invited Experts:

1. Prof. Fatemeh from UCL-UK and other experts - PCTWIN
2. Dr Usama Kadri, Professor at Cardiff University

Detection, Warning and Dissemination – Current Status / Highlights

Sovereign national tsunami warning principle

- Under ICG/IOTWMS there are **3 Tsunami Service Providers (TSPs)** (Australia, India, Indonesia) to provide tsunami information to National Tsunami Warning Centres (NTWCs)
- During the reporting period There were no major events $M > 6.8$ in the Indian Ocean region.
- **Threat information now being provided for non-seismic source tsunami**, eg volcanoes, by TSP-Australia. other two TSPs are planned to implement.
- **Maritime products for NAVAREAs to be trialed and implemented in 2025 by TSPs**
- **Competency training framework being developed for NTWCs**
- TSP operations are ISO compliant: ISO 9001 (India & Australia), ISO 22328-3 (Indonesia)



Recommendation of 19th Meeting of the ICG/IOTWMS Steering Group

- ❑ Harmonise TSP Standard Operating Procedures (SOPs) for non-seismic events (i.e., TGV), and update the TSP service definition document and NTWC user guides accordingly [Action: Working Group 2] [Status: Draft SDD V5.1 and NTWC user Guide 3.0 are prepared and will circulate to WG2 members]
- ❑ Engage with relevant Working Groups in the other ICGs (i.e., PTWS) and adopt the recommended methodology to define optimal monitoring networks for the Indian Ocean [Action: Working Group 2]
- ❑ Organise a regional webinar on tsunamis generated by volcanos / NAVAREA bulletins with support from the Secretariat [Action: Working Group 2] [Status: NAVAREA webinar planned on 02nd Sep 2025] [for TGVs yet to plan]
- ❑ Formulate guidelines on best practice in cyber security [Action: Working Group 2]
- ❑ Develop a short document detailing the TSP products for sharing with NAVAREA coordinators and related maritime stakeholders and making updates to IOTWMS SDD and NTWC User Guide [Action: Working Group 2] [Status: Draft User Guide is prepared and ready to circulate]
- ❑ Pursue the utilization of new technologies including the use of acoustic data for tsunami early warning in collaboration with Dr. Usama Kadri of Cardiff University [Action: Working Group 2 and Task Team on New Technologies]
- ❑ Formulate procedures for harmonizing early warning and response to multiple ocean hazards such as tsunami and storm surges, as a contribution towards Ocean Decade Challenge 6 and EW4All initiative - TBD

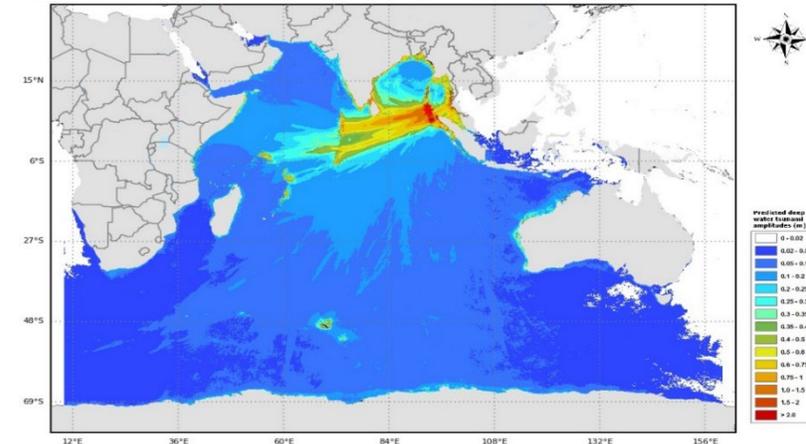
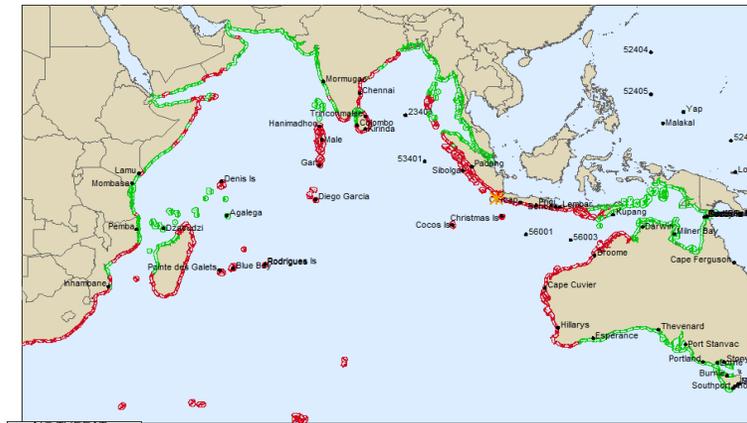
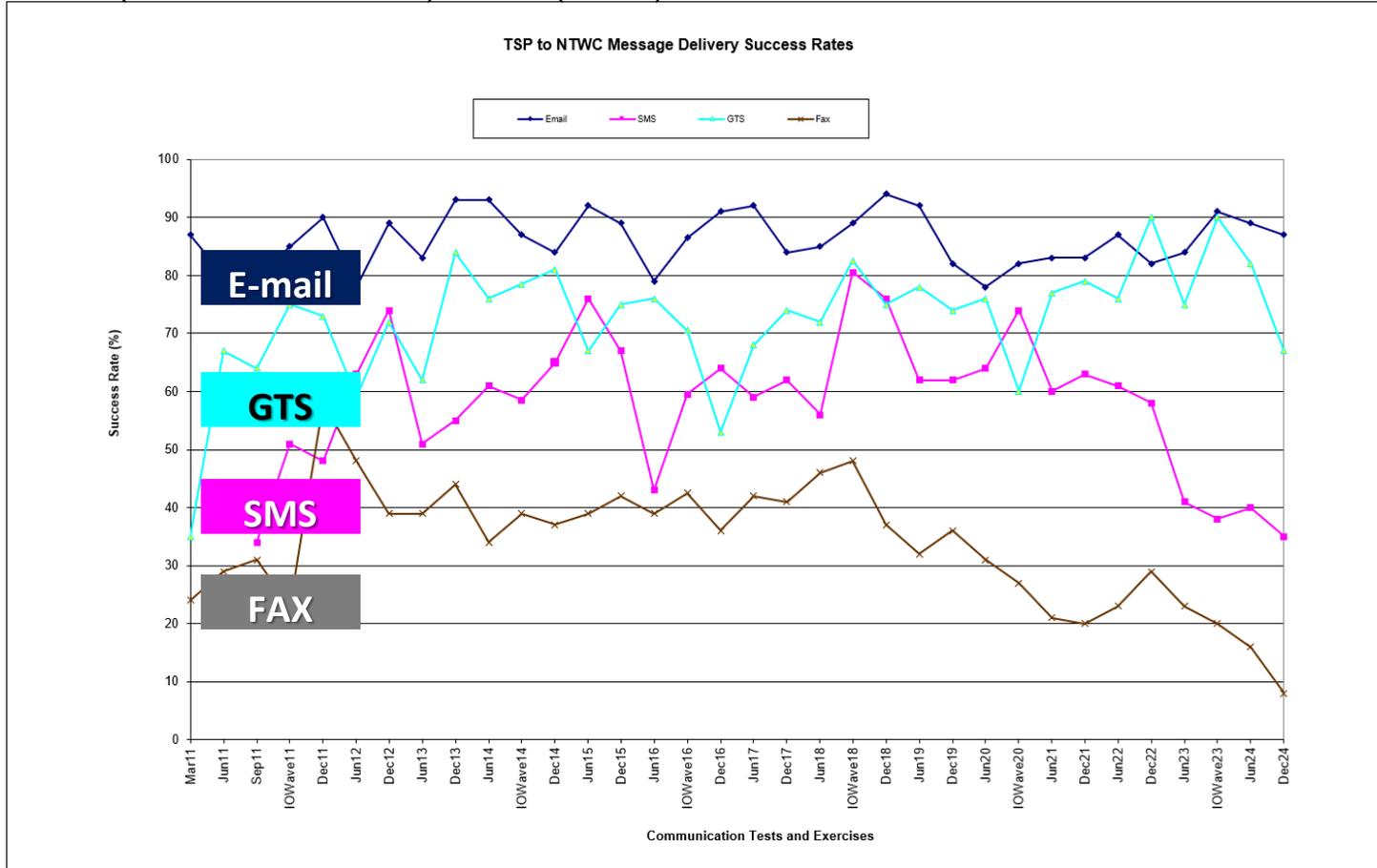


Key Updates since last ICG Intersessional, SG19 & WG2 Meetings

- ❑ TSPs developed capability to issue **NAVAREA products**, tested during communications in June 2025.
- ❑ A **draft NAVAREA User Guide** was prepared and will be circulated to NAVAREA Coordinators via the ICG/IOTWMS Secretariat.
- ❑ **Trial dissemination** of maritime bulletins to NAVAREA operators planned during **IOWave25**.
- ❑ **Pre-IOWave25 Webinar for NAVAREA Coordinators** on Strengthening Maritime Tsunami Alerting Mechanisms to be held **on 2 September 2025**.
- ❑ A **draft Generic TSP SOP for Tsunami-Generating Volcanic Events (TGVs)** is under development; **3 TSPs aim** to test it during the **IOWave25 Fani Maore volcano scenario**.
- ❑ **Contributed to Pre-IOWave25 online workshops** for Eastern, Western Indian Ocean; **TEMPP Trainings**;

IOTWMS Communication Tests

- As of today, 6 IOWave Exercises and 29 Communication Tests were conducted.
- During the reporting period, 3 COMMS tests were conducted since last SG 2024(June, December); 2025(June)



UNESCO IOC-TOWS-WG-XVIII Session and TT-TWO & TT-DMP meetings, Feb 2025

IOTWMS Participated in the below meetings

20 February

TOWS Joint Task Team Meeting (TT DMP and TT TWO)

21 – 22 February

- TT on Disaster Management and Preparedness meeting
- TT on Tsunami Watch Operation meeting

24 – 25 February

18th session of the Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS-WG)

Representation in Meetings

The following ICG/IOTWMS Officers participated and delivered status updates:

TOWS-WG:

- Mr. E. Pattabhi Ramarao – Chair, ICG/IOTWMS (online)

TT-DMP:

- Dr. Harkunti Rahayu - Vice-Chair, ICG/IOTWMS
- Mr. Ardito M. Kodijat - Head, IOTIC

TT-TWO:

- Mr. J. Padmanabham – Chair-WG2 (online)
- Mr. Nasser Said AL-ISMAILI- Vice-Chair-NWIO

Members of TT-TWO & TT-DMP were also participated in TOWS-WG as observers



<https://oceanexpert.org/event/4652>

Meeting of ICG/IOTWMS Working Group2, 25th August 2025

Key recommendations from TOWS-WG XVIII

SEALEVEL OBSERVATIONS

- ❑ **Member States to Consider** deploying sea-level gauges near tsunamigenic volcanoes, ensuring real-time continuous transmission (1-sec sampling, 1 cm accuracy) for automatic detection.
- ❑ **Member States to invest** in offshore seismic and sea-level observation systems (Tsunameters/DART®, GPS buoys, SMART Cables), with multi-hazard capability to serve seismology, meteorology, and oceanography.

Tsunami Forecasting and Tsunami Bulletins from TSPs (ICGs)

- ❑ To **ensure continuous TSP service** coverage.
- ❑ To **test and operationalize** maritime bulletins by **2025**.
- ❑ Continue investigating and adopting **probabilistic, impact-based tsunami forecasting** that could also assist response, recovery, and needs assessment
- ❑ develop **a global CAP template along with WMO by TT-TWO** for TSPs to NTWCs, between TSPs of different basins, and for public TSP bulletins, to be presented and approved by the TOWS-WG at its next session

Non-Seismic Tsunamis

- ❑ **ICGs: Develop SOPs for tsunamigenic volcanoes.**
- ❑ **ICGs: Link** NMHS with TSPs/NTWCs to ensure proper use of tsunami instruments.
- ❑ **TT-TWO:** Assess 10-min confirmation readiness; include landslide tsunamis in workplan.

UN Ocean Decade Tsunami Programme

- ❑ Develop reporting mechanism on Ocean Decade projects and against **ODTP-RDIP KPIs aligning with Global KPI Framework.**
- ❑ **ODTP Conference:** back-to-back with the IUGG Joint Tsunami Commission (JTC) International Tsunami Symposium (ITS), India in November

Key recommendations from IOC 33 Assembly

To Regional ICGs

- Ensure **continuous TSP service provision** across areas of responsibility.
- Develop **SOPs for tsunamigenic volcanoes** within their regions.
- Test **specialized maritime bulletins** and Achieve **full operational maritime bulletins by 2025**.
- Strengthen **NMHS–TSP/NTWC collaboration** to monitor tsunami Instruments
- Advance **probabilistic / impact-based tsunami forecasting** methods.
- Prioritize **Tsunami Ready workshops/summits in 2025 and before 2030**.

To IOC Secretariat

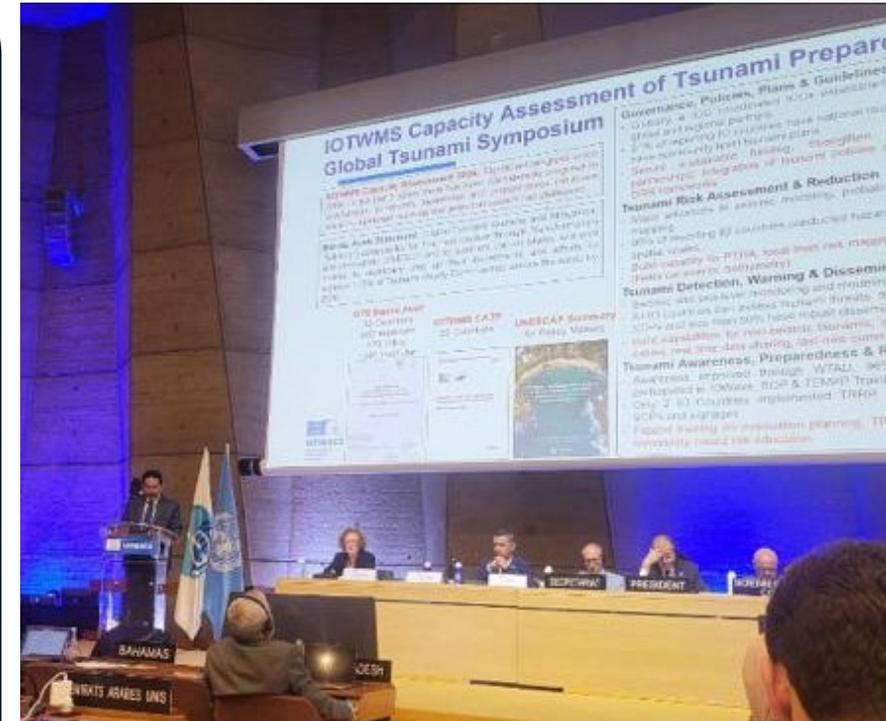
- Disseminate **Tsunami Ready Toolkit** to Member States and Tsunami National Contacts.
- Circulate the **basic tsunami warning template** for amateur radio use.
- Finalize and resource the **Tsunami Ready Coalition Implementation Plan** with partners, and co-chairs.
- Extend invitations to identified **Coalition partners and ambassadors**.

To IOC Member States

- **Deploy tide gauges and detection systems** in high-risk, under-served regions (Indian Ocean, North Africa, etc).
- Provide **financial and in-kind contributions** to support the Ocean Decade Tsunami Programme, Tsunami Ready Programme, and Coalition.
- **Work with emergency management authorities** to define criteria and institutions responsible for issuing *All-Clear* messages.

To IOC Assembly / IOC

- Approved the **Tsunami Ready Coalition Implementation Plan** (mandate, structure, partners).
- Extended the tenure and update terms of reference for **TT-DMP and TT-TWO**.
- Endorsed continued collaboration with **WMO** to develop a **global CAP template** for TSPs.



Mr. E. Pattabhi Ramarao represented IOTWMS and reported the progress in Thirty-third Session of the Assembly UNESCO, Paris, 25 June – 3 July 2025

<https://oceanexpert.org/document/36863>



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**Intergovernmental
Oceanographic
Commission**

Thank You