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# 2025 ICG/IOTWMS Secretariat Report

**Nora Gale**

**Srinivasa Kumar Tummala**

*Indian Ocean Tsunami Warning & Mitigation System Secretariat*

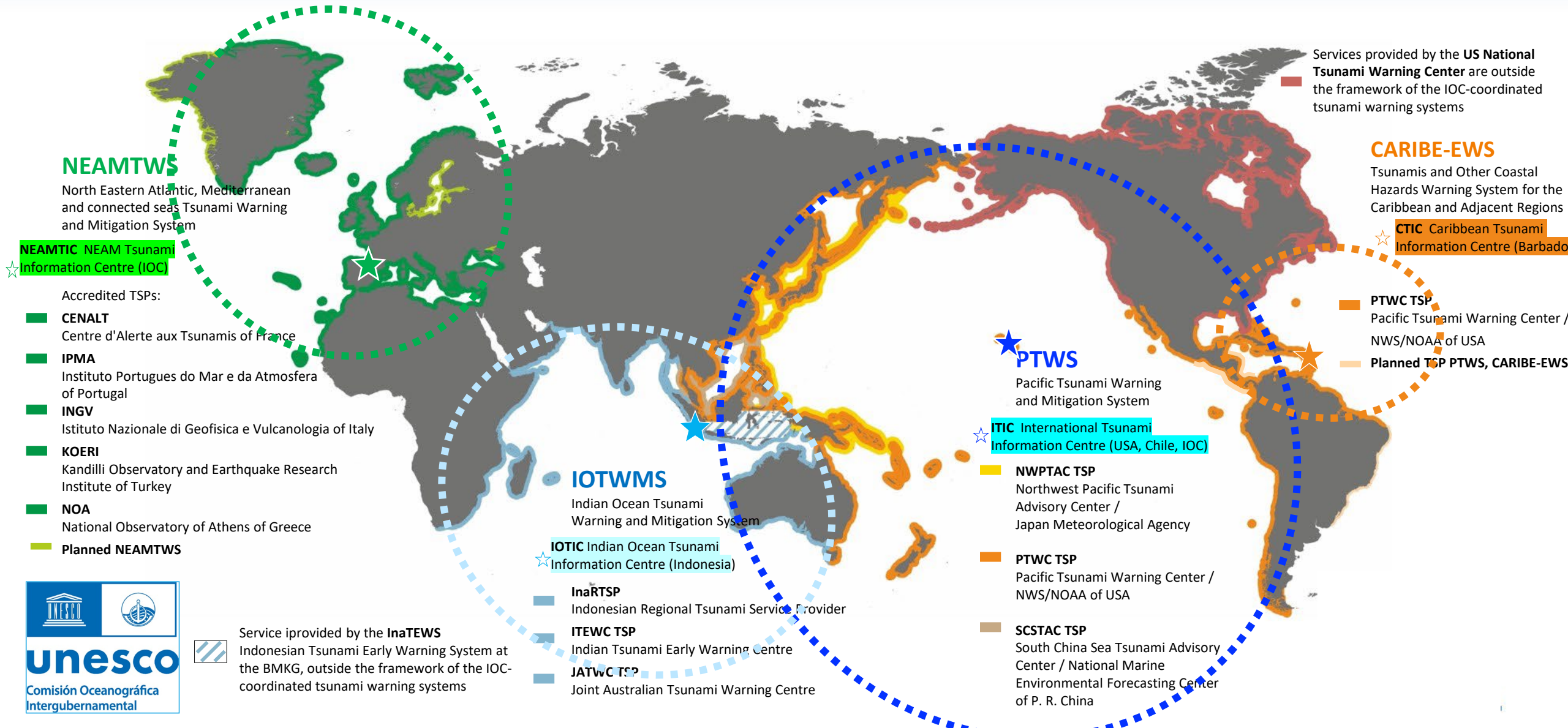
*[iotwms@unesco.org](mailto:iotwms@unesco.org)*

*19th Meeting of ICG/IOTWMS Steering Group, Jakarta, 17-19 June 2025*

# GLOBAL TSUNAMI WARNING AND MITIGATION SYSTEM

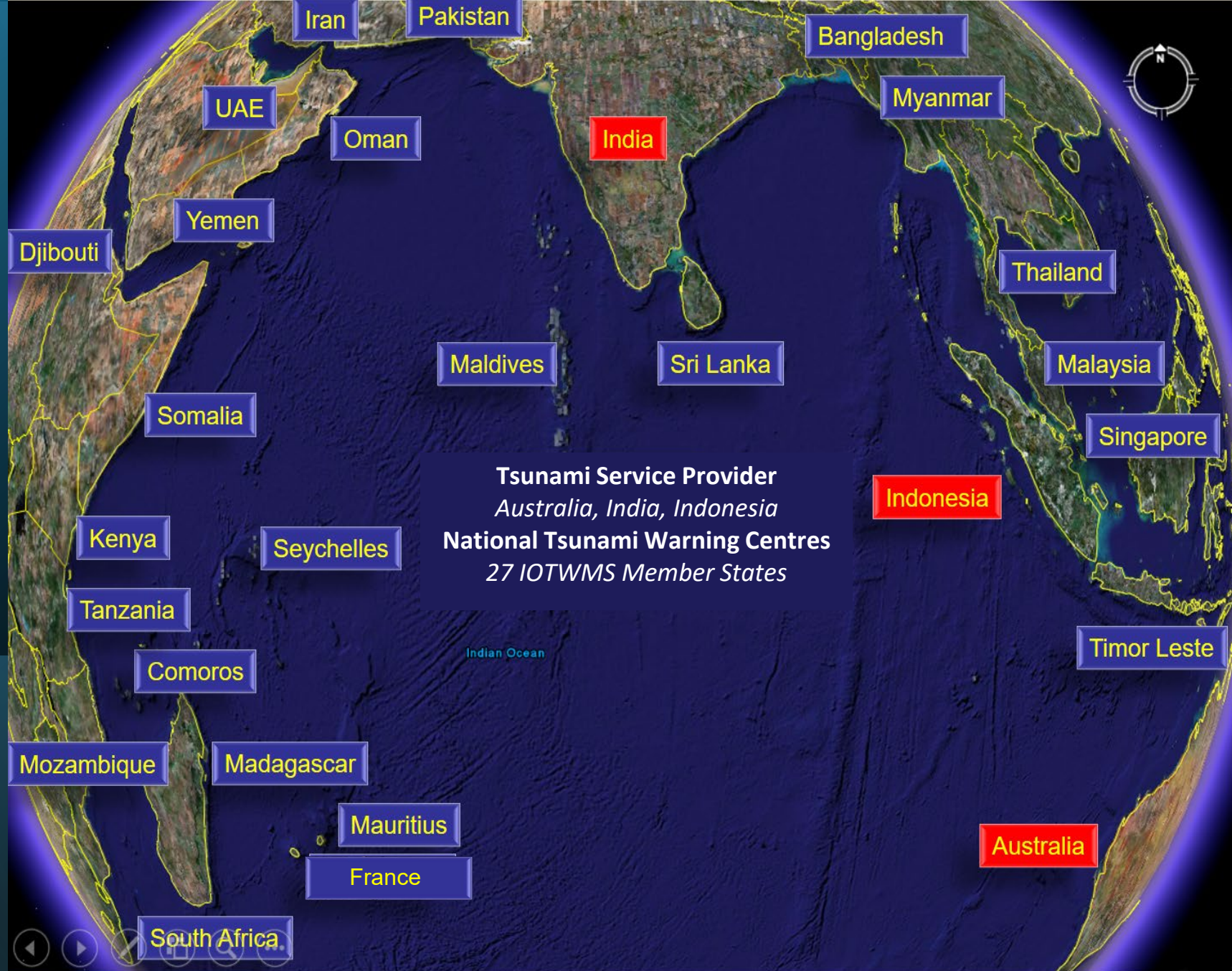
Intergovernmental Oceanographic Commission of UNESCO

<https://tsunami.ioc.unesco.org/>





# ICG/IOTWMS Member States

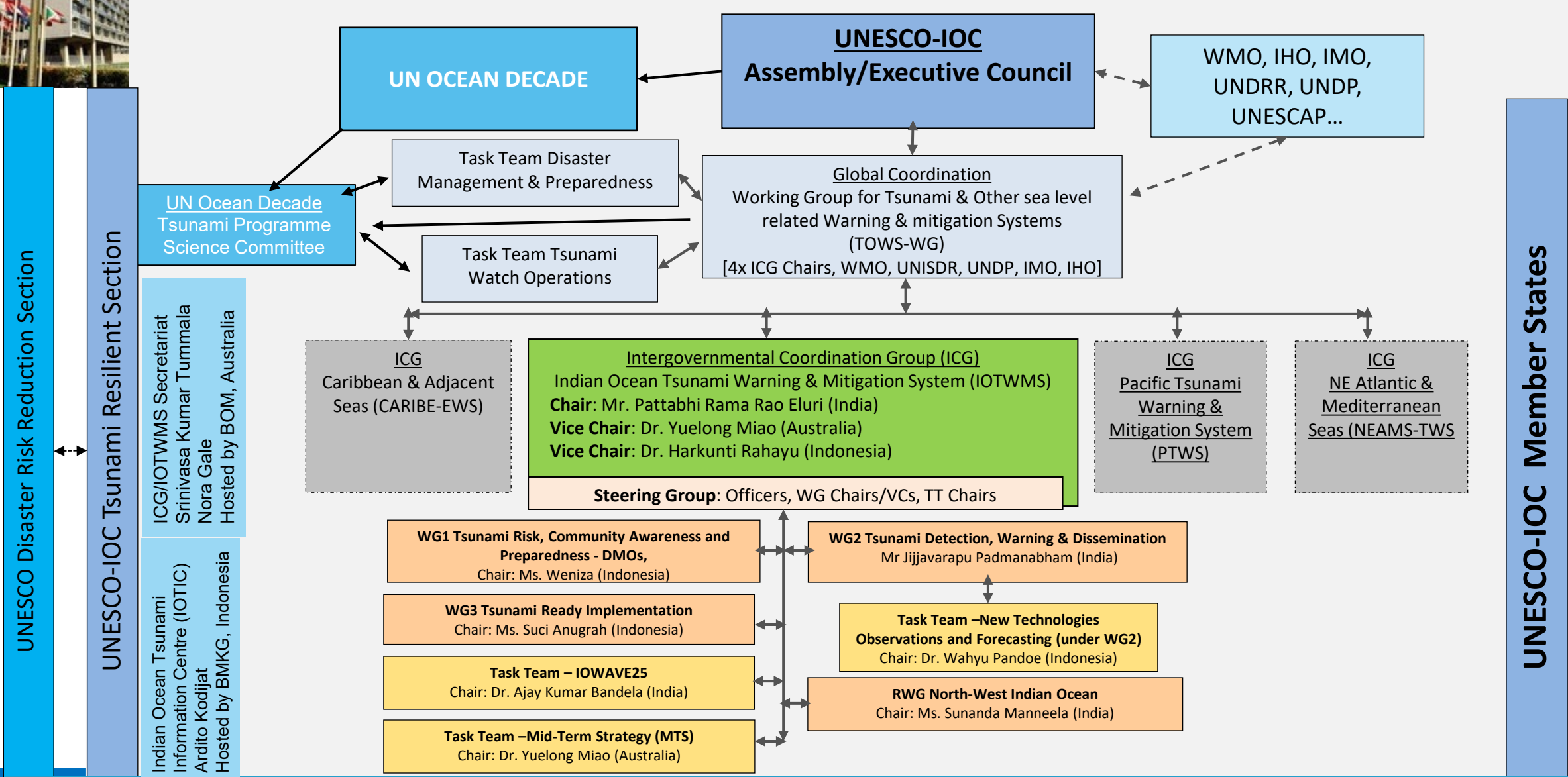


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# Governance





# ICG/IOTWMS Secretariat

## Staffing:

Two (2) full-time Project Appointments are hosted by the Australian Government through its Bureau of Meteorology in Perth:

- *Dr Srinivasa Kumar Tummala*, Head of Secretariat (2016-2020 & October 2024 to present)
- *Ms Nora Gale*, Assistant Programme Officer (August 2013 to present)

The Tsunami Resilience Section is located at UNESCO Headquarters in Paris and led by *Mr Bernardo Aliaga*. The Secretariat works closely with Mr Ardito Kodijat, Head of Indian Ocean Tsunami Information Center.

## Terms of Reference:

1. Support meetings of the Intergovernmental Coordination Group for the Indian Ocean Tsunami warning & Mitigation System (ICG/IOTWMS).
2. Facilitate the liaison among the various national contact points and national tsunami warning centres.
3. Maintain a current list of operational national contact points and facilities and make it available on request to all Member States.
4. Organize the liaison between ICG/IOTWMS and the ICG/ITSU, with the PTWC and with other tsunami warning centres to facilitate best practices in tsunami warning.
5. Initiate and support training activities and enhance and enrich tsunami warning in the Indian Ocean.



**Srinivasa Kumar Tummala**  
Head ICG/IOTWMS Secretariat  
Tsunami Resilience Section  
UNESCO-IOC



**Nora Gale**  
Assistant Programme Officer  
Tsunami Resilience Section  
ICG/IOTWMS Secretariat  
UNESCO-IOC

# Intersessional Meetings: 2025

- **Working Group on Tsunamis and Other Hazards related to Sea Level Warning and Mitigation Systems (TOWS WG) and its Task Teams**
  - 18<sup>th</sup> Meeting of TOWS WG and its Task Teams, Paris, France (hybrid), 20–25 February 2025
  - 3<sup>rd</sup> Meeting of the Tsunami Information Centres, Paris, France (hybrid), 26 February 2025
- **Working Group 1 on Tsunami Risk, Community Awareness and Preparedness Officers Meeting**
  - Online, 27 March 2025
- **Working Group 3 on Tsunami Ready Implementation Officers Meeting**
  - Online, 01 April 2025
- **Working Group 2 on Tsunami Detection, Warning and Dissemination Officers Meeting**
  - Online, 03 April 2025
- **Regional Working Group for the North-West Indian Ocean Officers Meeting**
  - Online, 03 April 2025
- **Task Team on Exercise Indian Ocean Wave 2025 (IOWave25)**
  - Various planning meetings of full Task Team as well as TSP representatives

## Other Events: 2025

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- **5th Meeting of Scientific Committee for the UN Ocean Decade Tsunami Programme**, Paris, France, 16-17 January 2025
- **First Ocean Decade International Coastal Cities Conference: Side Event on Coastal Cities Facing Sea Level Rise and Tsunami Threats**, Qingdao, China, 27 February 2025
- **People-Centred Early Warning for the Indian Coastlines (PCTWIN) Stakeholder Workshop & First Annual Meeting**, Kochi, India, 08-11 April 2025
- **UNESCAP 81st Session Side Event on Resilient Coasts: Enhancing Disaster Preparedness Through Regional Collaboration in Asia and the Pacific**, Bangkok, Thailand, 25 April 2025
- **20th IOGOOS (Indian Ocean Global Observing System) and Integrated Annual Meetings of IOP, SIBER, IRF and IIOE-2**, Port Louis, Mauritius, 05-09 May 2025
- **One Ocean Science Congress**, Nice, France, 04-07 June 2025

# Tsunami Evacuation Maps, Plans and Procedures (TEMPP)



## *Regional Training Workshop on Tsunami Preparedness*

**Dates:** 15–23 April 2025 (9 days)

**Location:** International Training Centre for Operational Oceanography (ITCOOcean), UNESCO Category 2 Centre, Hyderabad, India

**Hosted by:** Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences (MoES)

## *Participation*

- 35 participants from 17 countries
- 14 expert trainers from:
  - UNESCO Intergovernmental Oceanographic Commission (IOC)
  - India
  - Indonesia

## *Training Focus Areas*

1. Tsunami Inundation Modelling
2. Tsunami Evacuation Maps, Plans, and Procedures
3. UNESCO-IOC Tsunami Ready Recognition Programme



# Tsunamis Generated by Volcanos Webinar

<https://oceanexpert.org/event/4686>



**Organized by the UNESCO-IOC Tsunami Resilience Section**

**Dates:** 16 & 23 April 2025

**Objectives:**

- Present the report *"Monitoring and Warning for Tsunamis Generated by Volcanoes"* (IOC/2024/TS/183) and discuss its key recommendations.
- Identify volcanic tsunami hazards and highlight vulnerable Member States.
- Facilitate the establishment of partnerships between National Tsunami Warning Centres (NTWCs), Volcano Observatories, and Volcanic Ash Advisory Centres (VAACs).
- Initiate discussions on the potential need for Tsunami Service Providers to extend their services to cover volcanic tsunami events that may affect multiple Member States.

# People-Centred Tsunami Early Warning for the Indian Coastlines (PCTWIN)

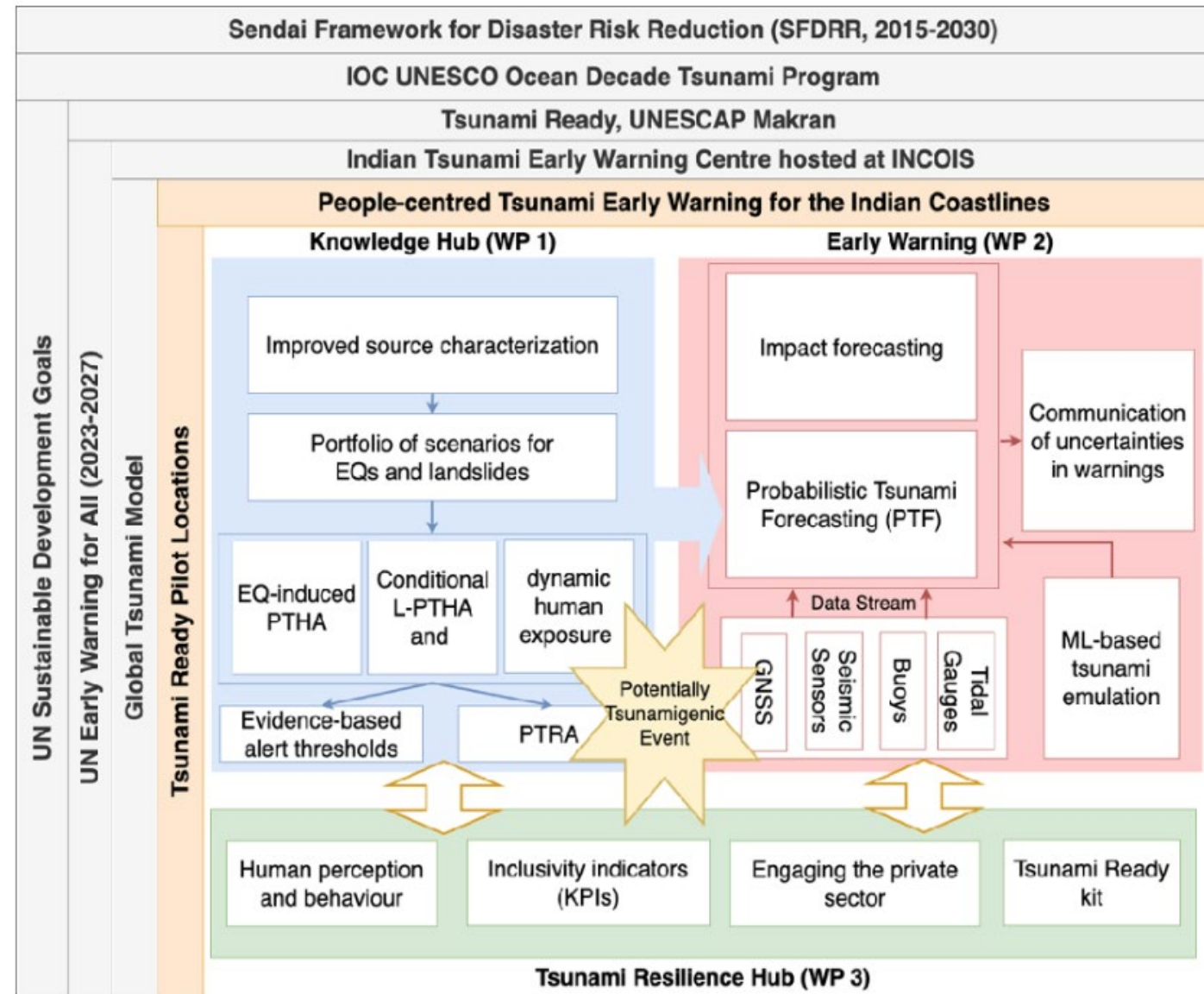
PCTWIN co-develops inclusive tsunami early warning systems for India's coastlines.

Led by UCL and INCOIS with global partners.

ICG/IOTWMS is an advisory board member.

## Objectives:

- Improve the understanding of and address knowledge gaps in the fundamental properties and physics of tsunamigenic earthquake and landslide processes.
- To improve detection and forecasting of tsunamis and to provide more effective and more inclusive tsunami warnings.
- Use participatory methods to make the tsunami warning chain more inclusive and to increase preparedness to respond to tsunamis.



# 2024 Capacity Assessment of Tsunami Preparedness in the Indian Ocean

## Policies, Plans & Guidelines

**Progress:** There has been an increase in the availability of national tsunami guidelines.

**Identified Gaps:** The development of tsunami-related policies and plans has seen little progress between 2018 and 2024.

**Recommendation:** Provide targeted training for authorities and stakeholders on developing integrated national Multi-Hazard Early Warning Systems (MHEWS) and dedicated tsunami policies and plans.

## Risk Assessment & Reduction

**Progress:** Nearly all countries have conducted both hazard and risk assessments to better understand tsunami threats.

**Identified Gaps:** Limited understanding of tsunamis generated by non-seismic and complex sources.

**Recommendation:** Leverage international expertise and collaboration to develop updated best practices for Probabilistic Tsunami Hazard Assessment (PTHA) across the Indian Ocean region. This should include methodologies for assessing tsunamis originating from non-seismic and complex sources.

## Public Awareness, Preparedness & Response

**Progress:** The 2024 IOWave exercises saw a notable increase in evacuation participation compared to 2018.

**Identified Gaps:** Evacuation signage and the availability of vertical evacuation shelters remain largely unchanged since 2018.

**Recommendation:** Establish regular tsunami preparedness programs at the local level—including cities, villages, communities, and schools—in addition to the biennial IOWave exercises.

## Tsunami Ready Recognition Programme

**Progress:** A total of 48 communities across the Indian Ocean have achieved UNESCO-IOC Tsunami Ready recognition.

**Identified Gaps:** Only two Member States—India and Indonesia—have officially recognized Tsunami Ready communities.

**Recommendation:** Implement regional and national training programs to support the rollout of the UNESCO-IOC Tsunami Ready Recognition Programme (TRRP), with a focus on Small Island Developing States (SIDS), Least Developed Countries (LDCs), and African States.

## Detection, Warning & Dissemination

**Progress:** Since 2018, the core components of the upstream tsunami warning system—detection, warning, and dissemination—have largely plateaued in development.

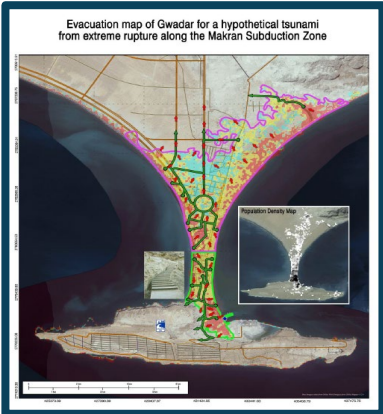
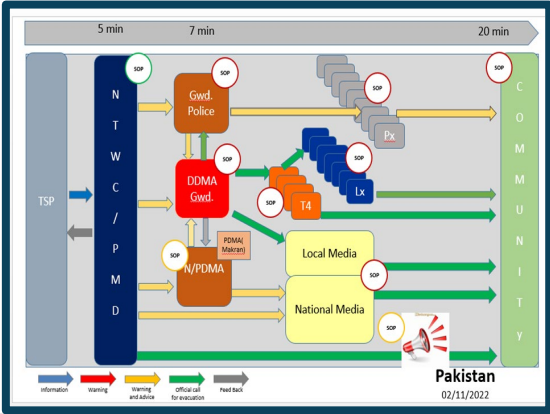
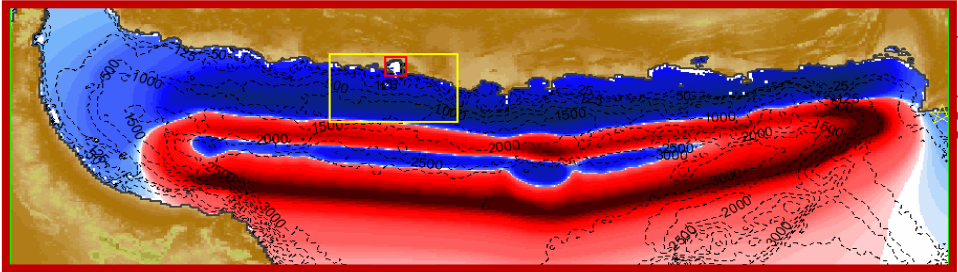
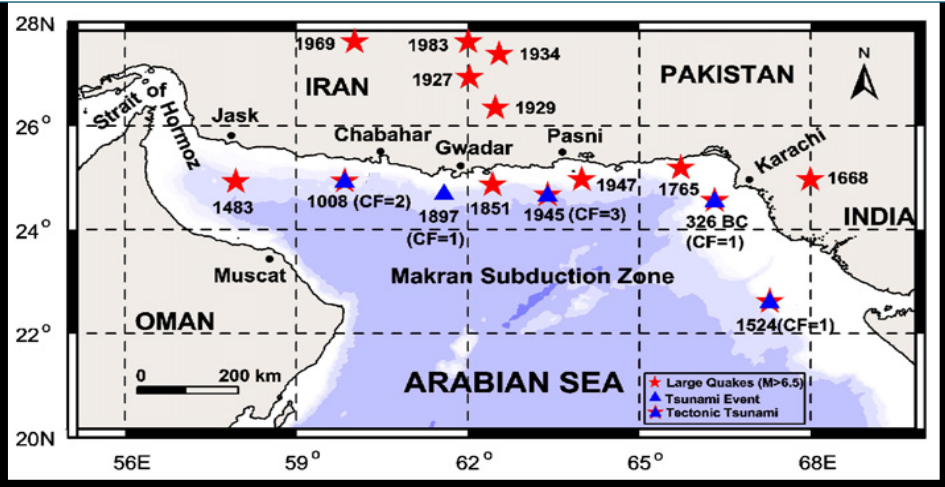
**Identified Gaps:** Limited adoption of emerging technologies such as SMART cables and GNSS networks, along with insufficient real-time data exchange.

**Recommendation:** Design and implement optimized observing systems, integrating seismic and sea-level monitoring technologies, to enhance the timeliness and accuracy of tsunami warnings.

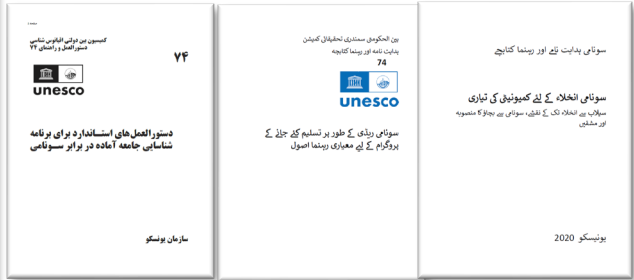
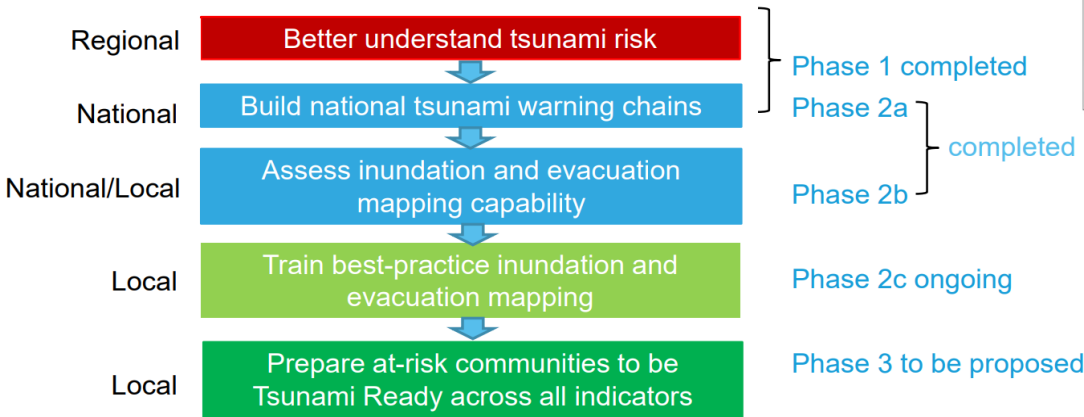


# Strengthening tsunami warning in the North-West Indian Ocean through regional cooperation

Funded by the UNESCO Multi-Donor Trust Fund, the project resulted in a unified Makran assessment, updated national tsunami warning chains, translated guidelines, and development of inundation & evacuation maps in **North-West Ocean Countries (India, Iran, Pakistan, Oman, UAE)**



## Programmatic Approach



## Tsunami Ready Implementation in Pilot Sites

Phase 3: Proposed for (2025-2027)



# Project Proposals

## USAID's FUST Small-Scale Activities

***Strengthening Community Resilience to Ocean Hazards through implementation of Tsunami Ready Recognition Programme in Indian Ocean SIDS and Africa***

**Deliverable:** Recognition of 1 community each in Madagascar and Seychelles as Tsunami Ready by the UNESCO-IOC

**Member States:** Madagascar & Seychelles

**Duration:** 18 months

✓ **Approved**

## ESCAP's Trust Fund for Tsunami, Disaster and Climate Preparedness

***Strengthening tsunami early warning in the Northwest Indian Ocean region through regional cooperation – Phase 3***

**Objective:** Improved community capacities for tsunami preparedness and response that are in line with the set of indicators of the UNESCO Tsunami Ready Recognition Programme (TRRP) in the 5 participating countries.

**Member States:** India, Iran, Maldives, Oman\*, Pakistan, Sri Lanka and United Arab Emirates (UAE)\*

\*Oman and UAE are not ESCAP countries but will be participating with their own funding

**Duration:** 24 months

✓ **Pending**

## Japan Funds in Trust

***Develop Effective End-to-end People-centred Integrated Multi-hazard early warning and Preparedness ACTION for tsunamis and other Sea-level related coastal hazards (DEEP-IMPACTS) in the Indian Ocean and Mediterranean SIDS & African Nations leveraging Japanese and UNESCO-IOC Expertise***

**Member States:** Mauritius, Seychelles, Tanzania, Madagascar, Mozambique (Indian Ocean) & Cabo Verde, Morocco (Mediterranean)

**Duration:** 36 months

✓ **Not Successful**

# Communication

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## *IOC Circular Letters*

**CL-3021:** Workshop on Tsunami Evacuation Maps, Plans, and Procedures and UNESCO-IOC Tsunami Ready Recognition Programme in Hyderabad, India, 9–20 March 2025

**CL-3026:** Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) – Call for nomination of experts to the ICG/IOTWMS Working Groups, Steering Group and Task Teams

**CL-3041:** Announcement of the Indian Ocean Tsunami Exercise (IOWave25) on 25 September, 15 October, 25 October and 5 November 2025

## *Publications*

**ICG/IOTWMS-XIV.1:** Decision of the Fourteenth Session of the ICG/IOTWMS

**IOC/BRO/2025/1:** Summary Statement from 2nd UNESCO-IOC Global Tsunami Symposium on Two Decades After 2004 Indian Ocean Tsunami: Reflection and Way Forward, Banda Aceh, 11–14 November 2024

**IOC Technical Series No. 181:** Exercise Indian Ocean Wave 23. An Indian Ocean-wide Tsunami Warning and Communications Exercise, 4–25 October 2023. Volume 2: Exercise Report.

**IOC Technical Series No. 193:** Capacity Assessment of Tsunami Preparedness in the Indian Ocean – Status Report, 2024

**Fact Sheets:** ICG/IOTWMS Steering Group, Working Groups and Task Teams



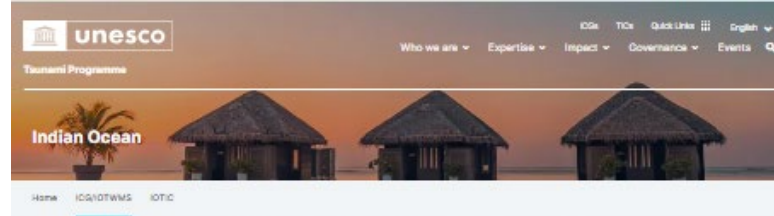
# New Website

- UNESCO-IOC Tsunami Programme  
<https://tsunami.ioc.unesco.org/en>
- ICG/IOTWMS  
<https://tsunami.ioc.unesco.org/en/indian-ocean/icg-iotwms>
  - Includes information on Member States (TSPs, NTCs, TNCs, TRFPs), Officers, Secretariat, Working Groups and Task Teams.



Indian Ocean

- IOTIC  
<https://tsunami.ioc.unesco.org/en/indian-ocean/iotic>
- Tsunami Ready  
<https://tsunami.ioc.unesco.org/en/tsunami-ready>
  - Viewer  
<https://tsunamireadyviewer.ioc-tsunami.org/>



## Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS)

The Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System (ICG/IOTWMS) coordinates international efforts in tsunami warning and mitigation within the Indian Ocean region. It plays a critical role in protecting lives by supporting its 27 Member States in assessing tsunami risk, implementing Tsunami Early Warning Systems, and in educating communities at risk about tsunami preparedness measures.



UNESCO-IOC, 2004

### Origins

In response to the 2004 Indian Ocean (Aceh) tsunami, the ICG/IOTWMS was established in 2005 through resolution X001-12 of the 23rd Session of the UNESCO-IOC General Assembly.

### ICG/IOTWMS Member States



Australia



Bangladesh



Comoros



France



India



Indonesia



Iran



Kenya

Load more

### Officers



**Patsabhi Rama Rao Eluri**  
ICG/IOTWMS Chairman  
Scientist-C & Group Director  
Indian National Centre for Ocean Information Services



**Yuelong Miao**  
ICG/IOTWMS Vice-Chairman  
Co-Director  
Joint Australian Tsunami Warning Centre



**Harkunti Rahayu**  
ICG/IOTWMS Vice-Chairwoman  
Associate Professor  
Bandung Institute of Technology, Indonesia

### Secretariat



**Srinivasa Kumar Tummala**  
Head ICG/IOTWMS Secretariat

Tsunami Resilience Section  
UNESCO-IOC



**Nora Gale**  
Assistant Programme Officer  
ICG/IOTWMS Secretariat  
Tsunami Resilience Section  
UNESCO-IOC

### Working Groups

The ICG/IOTWMS meets regularly to establish and implement working plans in the region.

It has formed three sessional Working Groups and a sub-regional Working Group to address specific technical issues.

Tsunami Risk, Community Awareness and Preparedness (WG-1)

Tsunami Detection, Warning and Dissemination (WG-2)

Tsunami Ready Implementation (WG-3)

Regional Working Group for the North-West Indian Ocean

### Task Teams

The ICG/IOTWMS has assigned three Task Teams:

Exercise Indian Ocean Wave 2025 (IOWave25)

New/Emerging Technologies for Observations and Forecasting

Medium Term Strategy

### Contact us

The ICG/IOTWMS Secretariat is hosted by the Government of Australia at the Bureau of Meteorology's Western Australia office in Perth.

Search out

# THANK YOU