1.b. Background:

Ocean Decade Tsunami Programme,

Tsunami Ready Recognition Programme, &

Capacity Assessment of Tsunami Preparedness

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Dr Yuelong Miao,
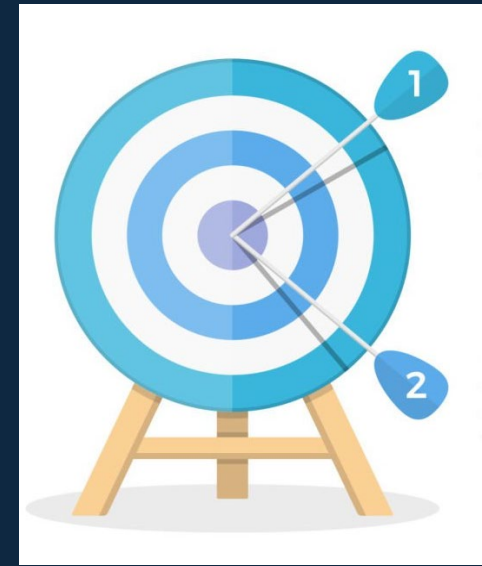Bureau of Meteorology, Australia; yuelong.miao@bom.gov.au

Pre-IOWAVE25 Workshop on Standard Operating Procedures for NTWCs and DMOs
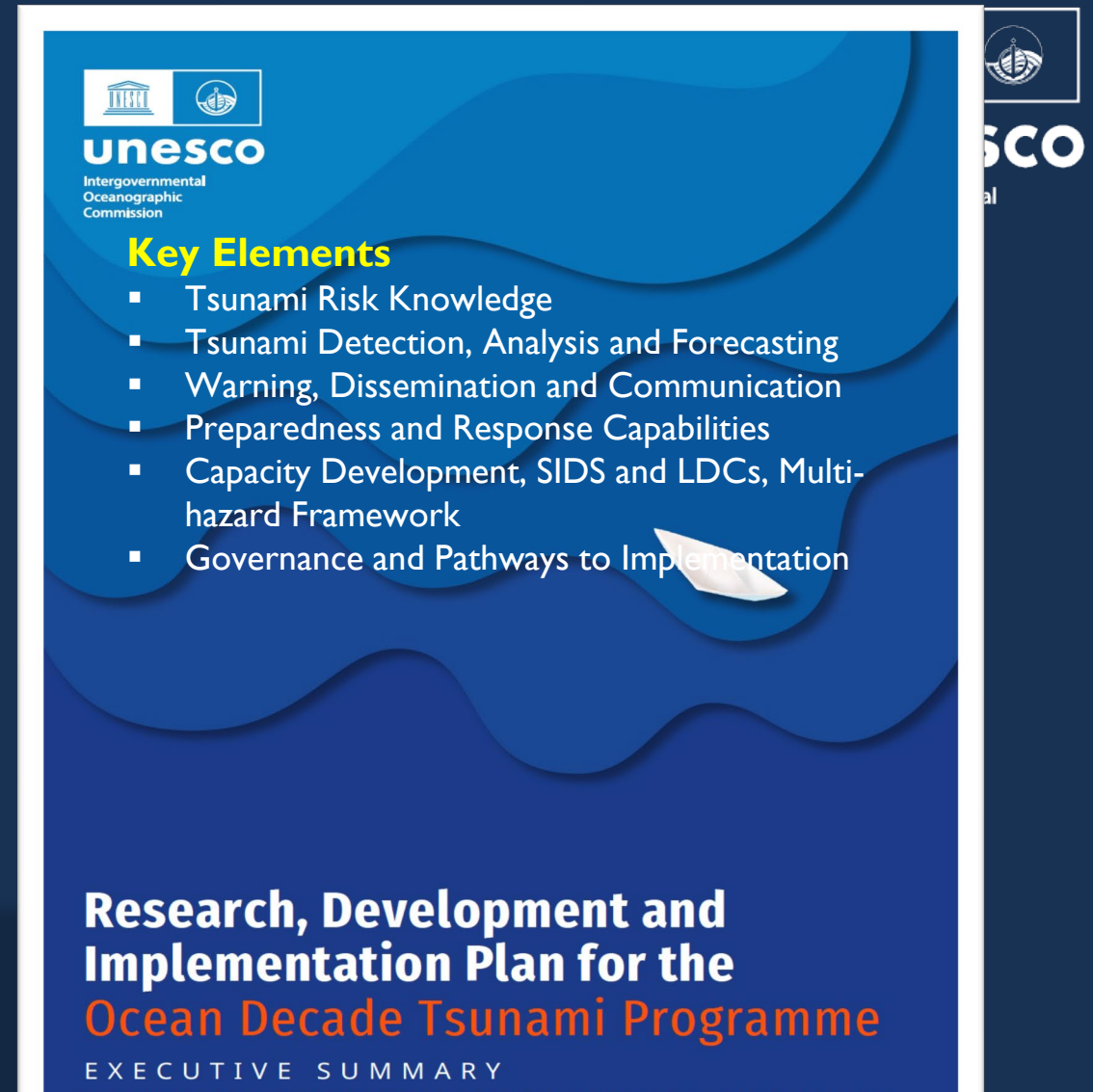**Hybrid – August 2025**

UN Ocean Decade Tsunami Programme

To develop the warning systems' capability to issue actionable and timely tsunami warnings for tsunamis from all identified sources to 100% of coasts at risk

100% of communities at risk be prepared and resilient to tsunamis by 2030 through programmes like the IOC-Tsunami Ready Recognition Programme (TRRP)

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Key Elements
- Tsunami Risk Knowledge
- Tsunami Detection, Analysis and Forecasting
- Warning, Dissemination and Communication
- Preparedness and Response Capabilities
- Capacity Development, SIDS and LDCs, Multi-hazard Framework
- Governance and Pathways to Implementation

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

EXECUTIVE SUMMARY

The Scientific Committee developed the draft 10-Year Research, Development and Implementation Plan for the Ocean Decade Tsunami Programme which was presented and endorsed at the IOC Assembly in June 2023

Key Elements of the Ocean Decade Tsunami Programme
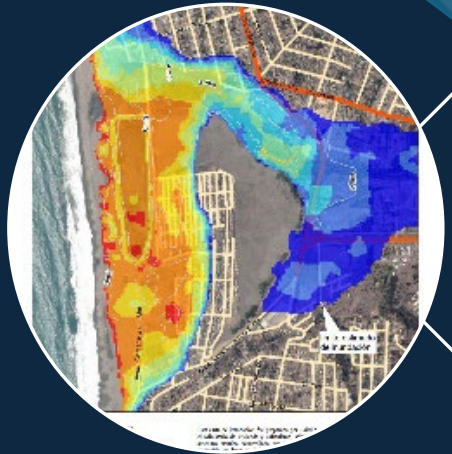
1. Tsunami Risk Knowledge: Identify and prioritise at-risk communities

- Advance Risk Knowledge
- Tsunami Hazard
  - Tsunami Hazard Assessment
  - Methodologies to Define Tsunami Parameters
  - Input data needed for THA (Tsunami Historical Records, Tsunami Source Scenarios, Non-seismic sources, High-resolution and updated digital elevation data)
- Exposure and Vulnerability
- Cascading Risk
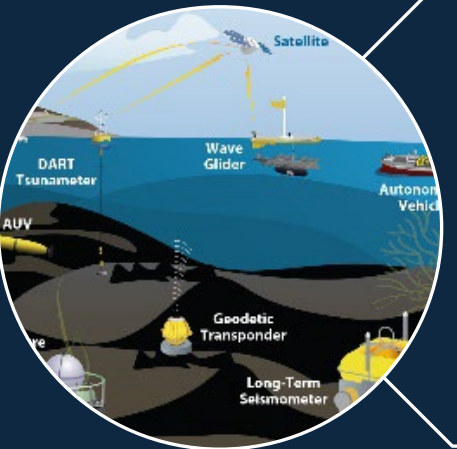
2. Tsunami Detection, Analysis and Forecasting: Expand existing, and deploy new observing technologies and warning systems

- Detection and Measurement: Maximise and expand current capability to meet ODTP goals, Implementation of existing capabilities not being applied to tsunami operations, Identification of new candidate capabilities

- Characterization and Forecasting: Database Applications and Matching Schema, Dynamic Charaterization

- Implementation: Instrument identification and density

Key Elements of the Ocean Decade Tsunami Programme

3. Warning, Dissemination and Communication: Access to data, tools, communication platforms, protocols and training to effectively warn coastal and maritime communities

By 2030 there will be significant improvements in the national decision making to warn, and mechanisms in place for the effective and inclusive construction, dissemination and communication of warnings.

- Decision-making to warn

- Construction of warnings and

- Warning dissemination and communication

4. Preparedness and Response Capabilities: To build tsunami-resilient communities

100% of communities at risk from tsunamis are prepared for and resilient to tsunamis by 2030 through efforts like the IOC-UNESCO Tsunami Ready Recognition Programme

- Risk Perception and Awareness

- Preparedness

- Response Capability and Mitigation

Key Elements of the Ocean Decade Tsunami Programme

5. Capacity Development, SIDS and LDCs, Multi-hazard Framework: Underpinning elements

Ensure investment in capacity development for the different stakeholders involved in the tsunami warning and dissemination processes

- - National, regional and local level initiatives to reach the objective of 100% at-risk communities to be prepared and resilient to tsunami
  - Facilitate equitable access to data, information, knowledge, technology, and infrastructure, leaving no-one behind
  - ICG-TICs and OTGA – STCs as the means for the delivery of capacity development
  - Special consideration to be capacity requirements of SIDs and LDCs

6. Governance and Pathways to Implementation

Explore opportunities and establish connections with Decade programmes, projects, contributions, DCCs and CoPs

- IOC Assembly --> IOC Executive Council & IOC Secretariat --> ICGs & TOWS-WG --> TT-TWO & TT-DMP

- Alignment with International Frameworks, Calls for Action and Multi-lateral Environmental Agreements, International Cooperation, Inclusiveness, gender diversity, and youth involvement, Accountability

- Through Member States, in coordination with the ICGs and their Tsunami Information Centres, and with the collaboration of academic institutions, researchers, industry, philanthropic organizations and other stakeholders.

ICG/IOTWMS Activities related to ODTP Objectives

Objective 1: To develop the warning systems' capability to issue actionable and timely tsunami warnings for tsunamis from all identified sources to 100% of coasts at risk

- UNESCAP Project on the Makran Subduction Zone – PTHA, Tsunami Early Warning Chains and TR Implementation (Ph-3)
- UKRI India Project on People-Centred Early Warning for Indian Coastlines (PCTWIN) – Endorsed as Decade Action
- INCOIS Project on Submarine Cabled Observatory near Andaman & Nicobar Islands - Endorsed as Decade Action
- Tsunami Potential Coastal Area of Indonesia Mountain Anak Krakata, Banten, Sunda Strait - Endorsed as Decade Action
- 2024 Capacity Assessment of Tsunami Preparedness - identify the Capacity Gaps and Priorities
- Warning Procedures developed / under development – Non seismic tsunamis, Maritime bulletins
- WG-2 + Task Team to work on Optimal Network Design, New Observation Technologies , Modelling & Forecasting Methods, KPIs

Objective 2: 100% of communities at risk be prepared and resilient to tsunamis by 2030 through programmes like the IOC-Tsunami Ready Recognition Programme (TRRP)

- 22 Communities in Indonesia recognized as IOC-UNESCO Tsunami Ready
- 26 Communities in India recognized as IOC-UNESCO Tsunami Ready – Endorsed as Decade Action
- 18 IOTWMS Member States nominated Tsunami Ready Focal Points
- TEMPP Training at INCOIS, Hyderabad during 09-20 March 2025
- WG-1 + WG-3 to prepare guidelines for TR Critical Infrastructure and inclusive SOPscal INfrasturcture
- No. 13.8 Tsunami Resilient Critical Infrastructure (SUSTAIN) – Endorsed as Decade Action

Tsunami Ready Recognition Programme (TRRP)

- Tsunami Ready Recognition Programme is a **community performance-based programme** that facilitates tsunami preparedness as an active collaboration of the community, community leaders, and national and local emergency management agencies.

- The main goal of the programme is to **improve coastal community preparedness for tsunami emergencies**, to minimise the loss of life, livelihoods and property, and to ensure a structural and systematic approach in building community preparedness.

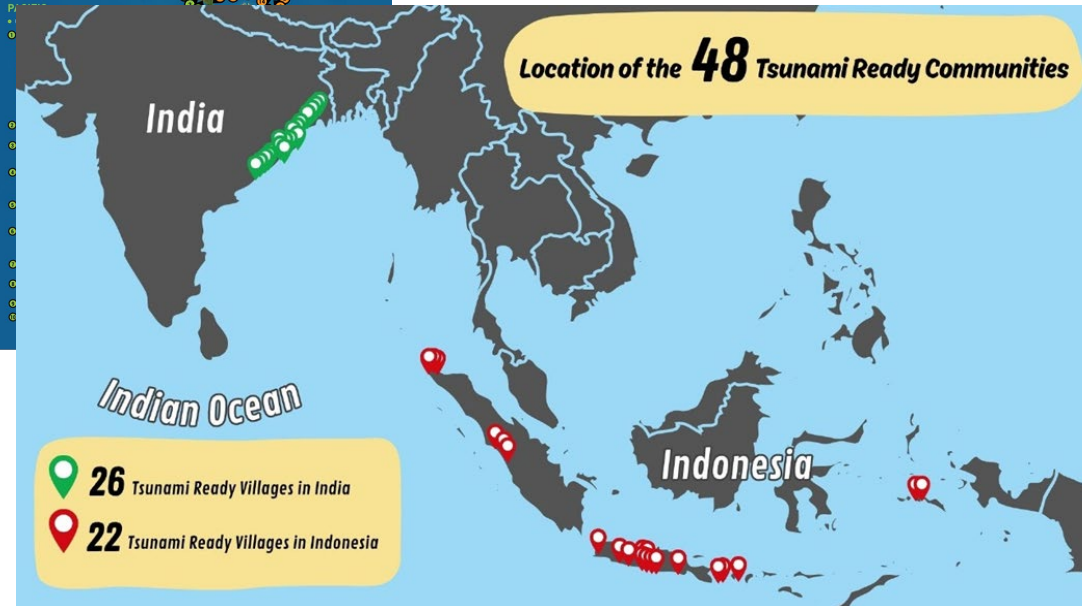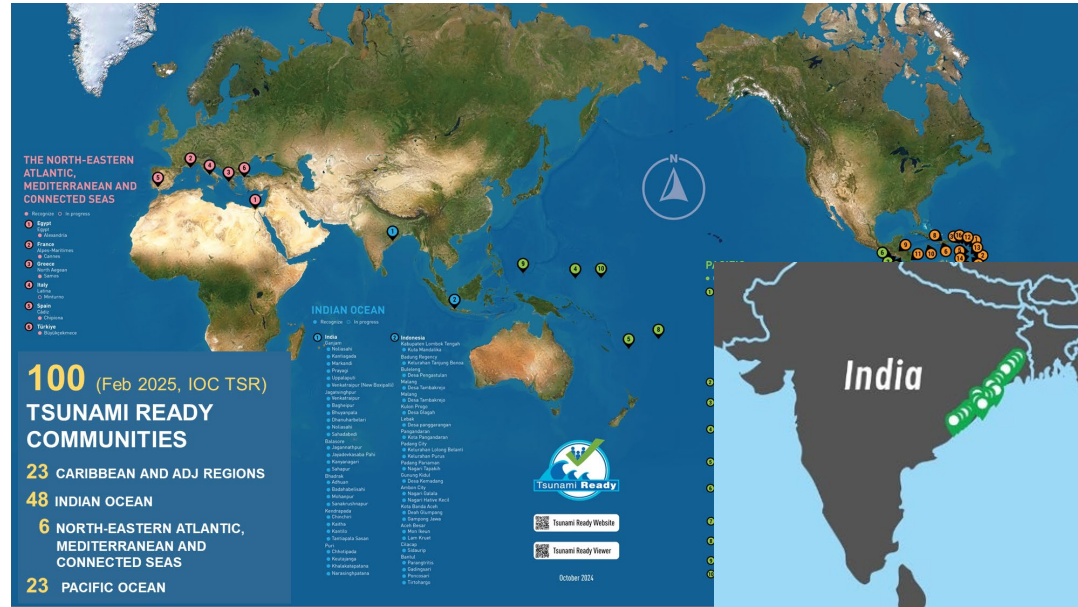- Based on 12 Indicators of Assessment, Preparedness, and Response

	UNESCO IOC TSUNAMI READY INDICATORS
I	**ASSESSMENT (ASSESS)**
1	ASSESS-1. Tsunami hazard zones are mapped and designated
2	ASSESS-2. The number of people at risk in the tsunami hazard zone is estimated
3	ASSESS-3. Economic, infrastructural, political, and social resources are identified
II	**PREPAREDNESS (PREP)**
4	PREP-1. Easily understood tsunami evacuation maps are approved
5	PREP-2. Tsunami information including signage is publicly displayed
6	PREP-3. Outreach and public awareness and education resources are available and distributed
7	PREP-4. Outreach or educational activities are held at least three times a year
8	PREP-5: A community tsunami exercise is conducted at least every two years
III	**RESPONSE (RESP)**
9	RESP-1. A community tsunami emergency response plan is approved
10	RESP-2. The capacity to manage emergency response operations during a tsunami is in place
11	RESP-3. Redundant and reliable means to timely receive 24-hour official tsunami alerts are in place
12	RESP-4. Redundant and reliable means to timely disseminate 24-hour official tsunami alerts to the public are in place

Tsunami Ready Recognition Programme (TRRP)

THE NORTH-EASTERN ATLANTIC, MEDITERRANEAN AND CONNECTED SEAS

100 (Feb 2025, IOC TSR)
TSUNAMI READY COMMUNITIES

23 CARIBBEAN AND ADJ REGIONS
48 INDIAN OCEAN
6 NORTH-EASTERN ATLANTIC, MEDITERRANEAN AND CONNECTED SEAS
23 PACIFIC OCEAN

Location of the 48 Tsunami Ready Communities

26 Tsunami Ready Villages in India
22 Tsunami Ready Villages in Indonesia

- **100** Community from **39** Countries are recognized as TRRP

- **National Tsunami Ready Focal Point** have been established for **19** Indian Ocean Member States

  - **48** Indian Ocean communities have received the UNESCO-IOC Tsunami Ready Recognition (**26** in India and **22** in Indonesia)

- National Tsunami Ready Board has been established (India, Indonesia and Seychelles)

2024 Capacity Assessment of Tsunami Preparedness in the Indian Ocean

Intergovernmental Oceanographic Commission
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Capacity Assessment of Tsunami Preparedness in the Indian Ocean

Status Report, 2024

UNESCO

Participants at the ICG/IOTWMS Capacity Assessment of Tsunami Preparedness Validation Workshop, Bangkok, 4-6 September 2024.

Summary:

2005–2018: Strong progress in warning & mitigation systems

2018–2024:

- Policies & plans stable or improved
- Hazard assessments widespread; risk assessments increasing
- Community preparedness growing:
  - More evacuation SOPs & drills
  - Increased signage & information boards
  - ➢ UNESCO-IOC Tsunami Ready Programme driving growth

IOTWMS Capacity Assessment of Tsunami Preparedness Global Tsunami Symposium

IOTWMS Capacity Assessment 2024: Significant progress since 2004. In the last 5 years there has been considerable progress in downstream community awareness and preparedness initiatives while the upstream warning and detection system has plateaued

Banda Aceh Statement: Global Tsunami Warning and Mitigation: Building Sustainability for The next decade through Transformation and Innovation. UNESCO and its partners call on States and civil society to drastically step up their investments and efforts to achieve 100% of Tsunami Ready Communities across the world by 2030.
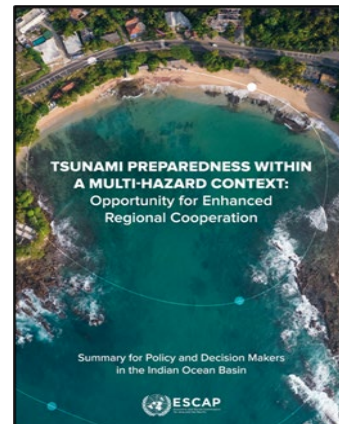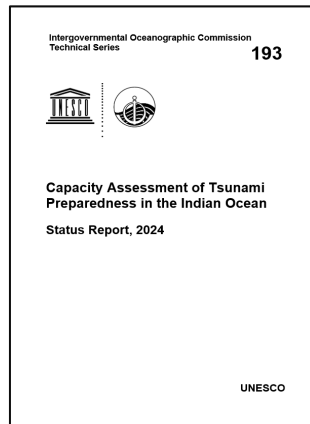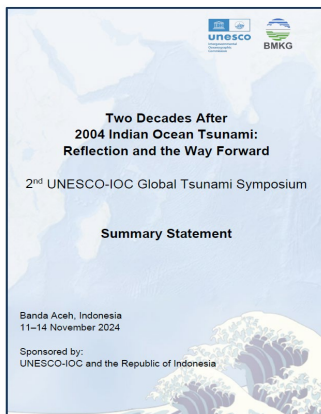
GTS Banda Aceh
32 Countries
682 in-person
170 online
1200 YouTube

IOTWMS CATP
22 Countries

UNESCAP Summary
for Policy Makers

Governance, Policies, Plans & Guidelines
- Globally, 4 IOC coordinated ICGs established. Strong collaboration with global and regional partners
- 91% of reporting IO countries have national tsunami policies, but only 50 % have community-level tsunami plans
- Secure sustainable funding; Strengthen regional and subnational partnerships; Integration of tsunami policies and plans into multi-hazard DRR frameworks

Tsunami Risk Assessment & Reduction
- Major advances in seismic modeling, probabilistic assessments, and risk mapping.
- 96% of reporting IO countries conducted hazard assessments but at varying spatial scales.
- Build capacity for PTHA, local level risk mapping & improve data availability (historical events, bathymetry)

Tsunami Detection, Warning & Dissemination
- Seismic and sea-level monitoring and modeling improved,
- All IO countries can assess tsunami threats. 91% operate 24/7 NTWCs with SOPs and less than 50% have robust dissemination systems
- Build capabilities for non-seismic tsunamis; implement GNSS and SMART cables; real-time data sharing, last-mile communication, NTWC training

Tsunami Awareness, Preparedness & Response
- Awareness improved through WTAD, 96% of reporting IO countries participated in IOWave, SOP & TEMPP Trainings
- Only 2 IO Countries implemented TRRP, many communities lack local SOPs and signages
- Expand training on evacuation planning, TRRP implementation, Drills and community-based risk education.

THANK YOU

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