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Mid-Term Strategy

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

Recall ICG/IOTWMS-XIV Decisions

12. Decides to set up a Task Team on MediumTerm Strategy (MTS) to prepare a draft MTS 2025-2030 considering key elements and approach as detailed in Annex 8 and with Chair Dr. Yuelong Miao (Australia) and Co-chair Dr. Harkunti Rahayu (Indonesia);

13. Request the Steering Group to supervise the work of the Task Team and to finalise the MTS 2025-2030 by early half of 2025;

Annex 8 to Decision ICG/IOTWMS-XIV.1

Approach for the development of the IOTWMS Medium Term Strategy 2025 – 2030

Use four pillars as adopted in the ODTP and EW4ALL, taking into consideration of similar strategies in other ICGs

- Pillar 1: Disaster risk knowledge
- Pillar 2: Detection, observations, monitoring, analysis and forecasting of hazards
- Pillar 3: Warning dissemination and communication
- Pillar 4: Preparedness to respond

Highlight achievements made in current MTS and what remains to be done

Consider all identified gaps and recommendations from

- Capacity Assessment Survey 2024
- 2nd Global Tsunami Symposium
- Learnings from recent events/exercises
- TSP Reports
- WG/TT reports
- TOWS-WG, other ICG reports
- Projects in flight/funded

Also Consider

- UN Ocean Decade/Challenge 6 White Paper
- ODTP
- EW4ALL
- New/emerging technologies
- Trend in political, technology, social/economical etc

Do thorough environmental scan (SWOT analysis) against each pillar.

Develop more specific implementation plan/section

- Should cover short-term and long-term goals and KPIs
- Leverage off ODTP RDIP and EW4ALL

Consider seeking input from external experts for improvement to the Strategy.

Task Team Membership will consist of Chairs of Working Groups, Task Teams, ICG/IOTWMS Secretariat, IOTIC, representatives nominated by Member States at the ICG Session.

Proposed Changes - Section Headings

Current MTS

1. INTRODUCTION
2. ANALYSIS OF THE CURRENT STATE OF THE IOTWMS
3. STRATEGIC PILLARS
4. FOUNDATIONAL ELEMENTS
5. IMPLEMENTATION
6. CONCLUSION

New MTS

1. INTRODUCTION
2. CURRENT STATE OF THE IOTWMS
3. STRATEGIC PILLARS
4. FOUNDATIONAL ELEMENTS
5. IMPLEMENTATION AND MONITORING
6. EXECUTIVE SUMMARY

Proposed Changes - Section 1. Introduction

Current MTS

1. INTRODUCTION
1.1 PURPOSE
1.2 VISION
1.3 CONTEXT
1.4 FRAMEWORK
1.5 STRATEGIC PILLARS
1.6 DOCUMENT STRUCTURE

New MTS

1. INTRODUCTION
1.1 PURPOSE
1.2 VISION (simplify?)
1.3 CONTEXT
1.4 FRAMEWORK (add ODTP?)
1.5 STRATEGIC PILLARS (4 not 3)
1.6 DOCUMENT STRUCTURE

Proposed Changes - Section 2. Current State

Current MTS

2. ANALYSIS OF THE CURRENT STATE OF THE IOTWMS

- Detailed risk assessment and reduction incomplete particularly the Makran region, lack high-resolution bathymetry and topography data.
- Exchanging observational data between neighbouring Member States and across the regions remains a challenge.
- Strengthening sub-regional collaboration, further developing modelling techniques and the use of new technologies such as GNSS and HF Radars.
- Maintaining 24/7 systems remains a great challenge.
- Exploring assessment, monitoring and responding to atypical tsunamis.
- Recognising IOTIC in developing awareness materials and educations
- Urgent efforts on capacity building and sustaining operational systems.
- Further effort to educate the media and the public.
- Remaining concerned of the budget for the ICG/IOTWMS

New MTS

2. CURRENT STATE OF THE IOTWMS

- Detailed risk assessment and reduction incomplete, lack high-resolution bathymetry and topography data.
- Exchanging observational data between neighbouring Member States and across the regions remains a challenge.
- Strengthening sub-regional collaboration, further developing modelling techniques and the use of new technologies such as GNSS, SMART Cable and HF Radars.
- Maintaining 24/7 systems remains a great challenge.
- Exploring assessment, monitoring and responding to non-seismic and complex source tsunamis.
- Recognising IOTIC in developing awareness materials and educations
- Urgent efforts on capacity building and sustaining operational systems.
- Further effort to educate the media and the public.
- Remaining concerned of the budget for the ICG/IOTWMS
- TRRP implementation which has been started in India and Indonesia communities, need to be expanded to other MSs.
- Regular ocean-wide tsunami exercises held

Proposed Changes - Section 3. Strategic Pillars

Current MTS

3.1 INTRODUCTION
3.2 STRATEGIC OBJECTIVES
3.2.1 Pillar 1: Risk Assessment and Reduction
3.2.2 Pillar 2: Detection, Warning and Dissemination
- 3.2.2.1 National Tsunami Warnings
- 3.2.2.2 Regional Tsunami Threat Information
- 3.2.2.3 Regional Earthquake and Tsunami Detection

3.2.3 Pillar 3: Awareness and Response

New MTS

3.1 INTRODUCTION
3.2 STRATEGIC OBJECTIVES
3.2.1 Pillar 1: Risk Knowledge
3.2.2 Pillar 2: Detection, Analysis and Forecasting
- 3.2.2.1 Regional Earthquake and Tsunami Detection
- 3.2.2.2 Regional Tsunami Threat Forecasting

3.2.3 Pillar 3: Warning, Dissemination and Communication
- 3.2.3.1 National Tsunami Warnings
- 3.2.3.2 Regional Tsunami Threat Information Service
- 3.2.3.3 Dissemination and Communication

3.2.4 Pillar 4: Preparedness and Response
- 3.2.4.1 Risk Perception and Awareness
- 3.2.4.2 Preparedness
- 3.2.4.3 Response Capabilities
- 3.2.4.4 Mitigation

Proposed Changes - Section 4. Fundamental Elements

Current MTS

4.1 INTEROPERABILITY
4.2 RESEARCH
4.3 CAPACITY BUILDING
4.4 FUNDING AND SYSTEM SUSTAINABILITY
4.5 OUTREACH
4.6 INDIAN OCEAN TSUNAMI INFORMATION CENTRE (IOTIC)

New MTS

4.1 INTEROPERABILITY
4.2 RESEARCH
4.3 CAPACITY BUILDING
4.4 FUNDING AND SYSTEM SUSTAINABILITY
4.5 OUTREACH
4.6 INDIAN OCEAN TSUNAMI INFORMATION CENTRE (IOTIC)

Proposed Changes - Section 5. Implementation

Current MTS

5. IMPLEMENTATION

New MTS

5. IMPLEMENTATION AND MONITORING

5.1 IMPLEMENTATION
5.2 PERFORMANCE MONITORING

Proposed Changes - Section 6. Conclusion

Current MTS

6. CONCLUSION

New MTS

6. EXECUTIVE SUMMARY

2024 IOTWMS Capacity Assessment

Priorities:

Policies and Plans. Provide training in development of integrated national MHEWS and stand-alone tsunami policies and plans. Provide training in development of specific tsunami guidelines in a multi-hazard framework. Optimise national resources in tsunami preparedness and response planning, in areas such as tsunami hazard assessments, harmonisation of early warning systems, and joint exercises.
Tsunami Hazard and Risk Assessment. Help further raise awareness of Member States and at-risk communities of the Indian Ocean tsunami hazard. Enhance the national capacity to undertake tsunami hazard and risk assessments in a multi-hazard framework down to local level.
Tsunami Detection, Warning, and Dissemination. Enhance the timeliness and accuracy of tsunami threat information and warnings. Enhance the capacity and effectiveness of NTWCs. Ensure People Centred national tsunami warnings reach all in the community.
Community Tsunami Awareness and Preparedness. Raise community awareness of tsunami threat. Enhance national capacities in tsunami evacuation planning. Enhance tsunami awareness and preparedness in schools.
Tsunami Ready Recognition. Train, both regionally and nationally, the implementation of TRRP or similar national or international initiatives (e.g. Weather Ready) to build resilience and make at-risk communities prepared and resilient against the tsunami threat. Implement and expand national TRRP or similar national initiatives to make at-risk communities prepared and resilient against the tsunami threat.
Tsunami Exercises. Continue to organise and enhance biennial IOWave Exercises for the Indian Ocean region to routinely test regional and national tsunami preparedness. Increase national tsunami exercises to more frequently test national tsunami preparedness

2nd Global Tsunami Symposium – upstream

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Gaps

- **Lack of data for detection**. Lack of adequate sea level data for tsunami detection and also monitoring infrastructure for early warning of non-seismic tsunamis (i.e., volcano, landslide, meteotsunami).
- **Limited data sharing**. Constraints in the extensive real-time sharing of freely available tsunami detection and forecasting data in order to improve timeliness and accuracy of tsunami forecasts.
- Warning for **non-seismic** and near-source events remains a challenge. TWS is limited to very few volcanoes.
- **Quick determination of earthquake magnitude** remains a challenge.
- **All-inclusive** tsunami warning and response remains a challenge.

Future Priorities

- Develop optimal observing networks capable of detecting all tsunamis within 10 minutes of generation.
- Identify and integrate new/emerging technologies into tsunami detection, modelling and forecasting systems.
- Develop numerical modelling, and scenario databases of non-seismic tsunamis.
- Increased accuracy and shorter dissemination times for tsunami threat information.
- People-centred tsunami early warning systems inclusive of all genders, children, elderly and people with disabilities.

2nd Global Tsunami Symposium – downstream

Gaps

- **Limited high-res bathymetry data**.
- Lack of risk assessment for **non-seismic and complex sources**.
- **Lack of local-level** risk assessment and **smaller impact scenarios**
- **Lack of paleo-tsunami studies**.
- **Not reaching every individual and sector** with the appropriate, useful, and timely information
- **Slow momentum to implement TRRP** and/or not equal across all regions and sub- regions.

Future Priorities

- Acquire more high-resolution near-shore bathymetry and topography data
- Extend risk assessment to non-seismic and complex sources
- Conduct Paleo-tsunami studies
- Preparedness needs to strive to address all.
- Emphasis on early education
- Scale up the implementation of TRRP through careful planning for each region
- Make TRRP (or similar initiative) a national priority.
- Establish an effective Tsunami Ready Coalition.
- Promote TR implementation for critical infrastructure facilities

ODTP – RD Plan of 2023

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Objectives

1. To develop the warning systems' capacity to issue actionable and timely tsunami warnings for tsunamis from all identified sources to 100 percent of coasts at risk by 2027.
2. To make 100 percent of communities at risk to be prepared and resilient to tsunamis by 2030 through efforts like the IOC-UNESCO Tsunami Ready Recognition Programme (TRRP).

Challenges in four pillars of

1. Risk Knowledge. Hazard assessments should also include all possible tsunami sources affecting the interest areas, and not only seismic sources.

2. Detection, Monitoring, Analysis and Forecasting.

- For local source tsunami, important to educate the community about physical signs.
- Challenge to densify real-time, multi-faceted sensor networks and faster, integrated algorithms to quickly characterize the tsunami source and compute tsunami inundation forecasts.
- The warning system must identify, monitor, and forecast the risk at the earliest possible time for their coasts.

3. Warning Dissemination and Communication.

- Incorporating tsunami into multi-hazard communication systems to ensure sustainability and readiness.
- To ensure as many people as possible are alerted, numerous communication channels must be used.
- Utilise international standard Common Alerting Protocol (CAP).

4. Preparedness and Response Capabilities.

- Efforts will be made to research tsunami risk perception.
- Need continuing and enhanced engagement from governments, research institutes and universities, industry, communities, the media, and other interested parties.
- Motivate communities to take common-sense preparedness actions such as via implementing TRRP.
- Mitigation measures are required, like the design and construction of blue, green and grey infrastructure, standards for vertical evacuation facilities, and appropriate urban planning.

Governance: 1. Tsunami Warning in a Multi-hazard Framework 2. Inclusiveness, Gender diversity and Youth involvement.

Capacity Development. Continue to develop scientific knowledge of tsunamis and social behaviour. Pay special attention and priority to SIDS and LDCs.

IOC Mid Term Strategy 2022-2029

IOC will work with Member States and UN partners to increase the understanding of ocean-related risks and to implement effective multi-hazard early warning systems.

IOC will:

- support closer intergovernmental coordination of multi-level regional tsunami warning systems;
- promote the involvement of key stakeholders in the tsunami warning systems, including civil defence authorities and national hydrometeorological services;
- accelerate implementation of the Tsunami Ready programme;
- promote research and development of more technically developed tsunami detection and warning systems capable of addressing non-seismic sources of tsunami;
- strengthen the regional Tsunami Information Centres and augment their ability to provide a clearinghouse for the development of educational and preparedness materials;
- coordinate research, monitoring, and development of management tools for Harmful Algal Blooms;
- increase technical and scientific capacity of early detection and warning of marine invasive species (e.g., by applying novel observing technologies such as DNA metabarcoding);
- target CD and technical assistance to enhance Member States' abilities to develop preparedness, mitigation and awareness in a multi-hazard framework;
- ensure that the ocean observing system responds to requirements for ocean data, exchanged in real time, for operational early warning of ocean-related hazards; and
- support modelling, research, data processing tools, policy development and planning tools contributing to improved warning systems, preparedness for ocean hazards, and ocean information services.

Ocean Decade Vision 2030 White Paper

Challenge 6: Increase community resilience to ocean hazards

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Table 1: *Relevant ocean and coastal hazards*

OCEAN AND COASTAL HAZARD CATEGORY	SINGLE HAZARD NOMENCLATURES
Geophysical/ Geological	Tsunamis, Landslides, Subsidence, Volcanic crisis, Coastal erosion, Earthquakes
Ocean Weather, hydrology, and climate	Tropical and extratropical cyclones and storms, Sea-level rise, storm surge, meteo-tsunami, coastal flooding, waves and waves runup, currents, marine heat waves, glacial melt, heavy rainfall and river flooding, saltwater Intrusions, droughts
Ecological	Wetland Degradation, acidification, de-oxygenation, biodiversity loss habitat loss, coral bleaching, eutrophication, connectivity
Biological	Harmful Algal Blooms, Invasive Species, aquatic diseases, nuisance
Local Anthropogenic and infrastructure	Coastal urbanization pressures, submarine cable damages, inshore mining, land reclamation, groundwater extraction, Coastal wastewa outflow, Marine Pollution and marine debris accumulation, Overfish spills, oil spills, nuclear waste, agricultural runoff, coastal tourism political interference and corruption, maladaptive planning

Enhance multi-hazard early warning services for all geophysical, ecological, biological, weather, climate and anthropogenic related ocean and coastal hazards.

(i) Developing 'people-centered' multi-hazard EWS, and
(ii) Designing adaptation planning strategies to enhance coastal resilience.

Table 2. *Components of Coastal Resilience and their subdivision in specific elements*

COASTAL RESILIENCE COMPONENTS	ACTIVITIES/ELEMENTS
Risk assessment	RA.1 Multi-hazard evaluation frameworks RA.2 Multi-level, multi-sector risk analysis RA.3 Exposure and vulnerability analysis
Risk reduction	RR.1 Monitoring, Forecasting and Early warning systems (multi-hazard) RR.2 Warning Dissemination & Communication RR.3 Preparedness & Response RR.4 Sectoral medium to long term planning (zoning, infrastructure) RR.5 Nature-based solutions RR.6 Digital twins
Institutional/Governance/social transformation	GIS.1 Marine and Maritime Spatial Planning GIS.2 Governance Framework GIS.3 Disaster recovery planning GIS.4 Equitable coastal resilience GIS.5 Government investments, financing and insurance GIS.6 Capacity building GIS.7 Corporate social responsibility

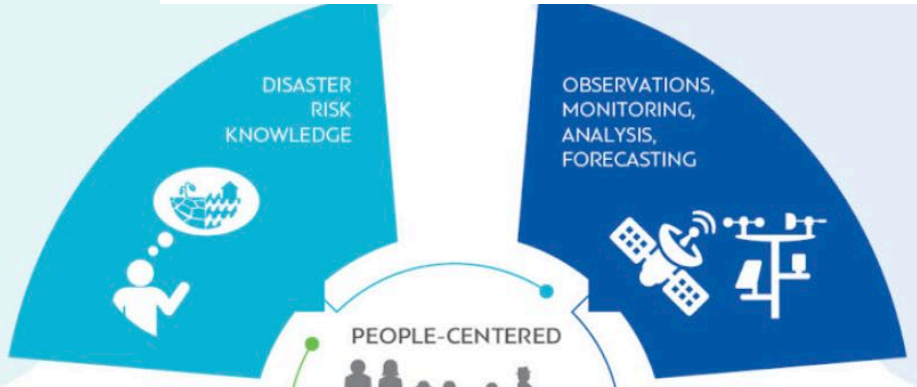
EW4ALL

Executive Action Plan 2023-2027

The Four Pillars:

Early Warnings for All is built on four pillars that are the cornerstones of the initiative and of effective multi-hazard early warning.

- Disaster risk knowledge and management (led by UNDRR)
- Detection, observation, monitoring, analysis, and forecasting (led by WMO)
- Warning dissemination and communication (led by ITU)
- Preparedness and response capabilities (led by IFRC)



- Countries have data and tools to generate early warning products
- Risk data is generated in a format adopted to early warning needs
- Institutions have capacity to issue impact-based forecastings and warnings

UNDRR
UN Office for Disaster Risk Reduction

- Countries access global and regional forecasting products from GPCs, RSMCs, and NMHSs
- Countries have national hydrometeorological plans, strategies and legislation
- Countries access innovative forecasting and prediction products such as satellite data and applications

WORLD METEOROLOGICAL ORGANIZATION

- Preparedness and anticipation action plans are operational and linked to predictive and warning services
- Risk maps, advisories and other warnings products are available through ITC channels adopted to the user needs
- Warnings services are co-produced with organizations representing stakeholders - different gender, youth, older persons, people with disability, poor, marginalized and displaced people

IFRC

- National ITC regulators promote and use CAP for national telecommunication companies
- Warnings are issued in Common Altering Protocol (CAP) format
- NDMOs and NMHSs develop and apply standard operational procedures that are people-centered

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Environmental Scan

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Legal
- *What changes in regulation/legislation are possible?*
- *What will their impact be on our business?*
- *Stability of government*
- *Outsourcing regulation*
- *Government Bureaucracy – rules and regulations*
- *Legal constraints*

Technological
- *To what extent are existing technologies maturing?*
- *What technological developments or trends are affecting or could affect our business?*
- *New product development, potential markets: government, International, resource sector etc*
- *Productivity improvements through automation*
- *Telecommunication infrastructure*
- *Online connectivity and digital data*

Competitive
- *Who are our competitors?*
- *How are we different from our competition?*
- *How competitive are we and what affects our ability to compete?*
- *What are the customer's problems and complaints with the current products and services?*

Market
- *What are the general "market" conditions our business?*
- *Which way is the market heading?*
- *What needs are there for our products and services in the market?*
- *What are the customer-market-technology opportunities?*

Cultural/Social
- *What are the current or emerging trends in lifestyle?*
- *What are their implications?*
- *What demographic trends will affect the market size (growth rate, income, population shifts)?*
- *Do these trends represent an opportunity or a threat?*
- *Changes in consumer behaviour?*
- *Increasing environmental awareness?*
- *Urbanisation*
- *Consumer demands; personalisation and high-end experiences*
- *Public demand for transparency and participation in decision making*

Economic
- *National and internal financial trends (trends in economic forces)*
- *What economic trends might have an impact on business activity?*
- *Emerging markets*
- *Economic factors: inflation, employment levels, supply, energy available, global financial situation*

Environmental Scan – draft

	Strength	Weakness	Opportunity	Threat
Legal	UN mandates IOC-UNESCO to lead the global tsunami coordination; Country-level tsunami Act/Policy provides clear roles and responsibilities of agencies in the warning chain; bi/multi-lateral MOUs to enable data sharing and collaboration to advance EWS	Not always binding obligations for countries to implement on UN guidelines; Country deciding priorities	Ocean Decade Tsunami Programme; EW4ALL; Like-minded UN agencies – UNDRR, UNDP, ESCAP, WMO	Geopolitical tension/country priority change
Technological	Established regional tsunami EWS and global standards; advances in countries; data sharing; more modern channels to spread tsunami advices widely	Risk assessment to local level remaining poor. Gaps in detection particularly for non-seismic sources; diverse maturity of EWS; not able to quickly turn science advances to operations; overly relying on funding	Adopt new technologies (SMART Cable, GNSS, Hydrophone, Infrasound) and faster computing in EWS; adopt cell broadcast and social media channels for wide penetration of warning messages; expand data sharing by agreement and collaborating with 3rd party providers	New events could expose further inadequacy in EWS particularly near-field and non-seismic sources; degrading sea level networks/EWS with funding reduction
Competitive	National warning authority; international coordination by IOC/UNESCO; system of systems; training, ISO, structured learnings of events and exercises	Infrequent tsunami occurrence causing low staff competency, poor EWS and poor public awareness; loss of trust to EWS	More demand on NTWCs/TSPs and do better, particularly when near-field, complex and non-seismic events occur.	Non-seismic relying on others to support or lead; complex multi-hazard lacked clear roles and responsibilities (e.g., meteotsunami)

Environmental Scan – draft

	Strength	Weakness	Opportunity	Threat
Market	End-to-end warning and mitigation system built on long-term partnerships from data flow to process flow.	Not all countries recognise the importance of TSPs and regional cooperation; Media and the public still source other non-authoritative info.	Expand training workshops to all countries in need; extend exercise and training to media and the public	Individual and private companies provide misinformation; hard to counter misinfo online/social channels
Cultural/Social	Tourism helps spread learning of tsunami from different countries. More people recognise who is the warning authority & emergency response authority.	More people touring/settling in coastal areas. hard to educate tsunami risk and what to do upon a warning/event with people of diverse background and language barrier and countries of diverse tsunami signage, tsunami communication means and evacuation infrastructure. Coastal management not considering tsunami risk.	Raise awareness through social media and younger/travel-active generation; engage tourism industry to be more tsunami informed.	Any EWS issues be magnified by social media causing irreparable reputation damage
Economic	Tsunami EWS sustained despite economic challenges in countries; Continued support to Secretariat and IOTIC	Lack of fund for improvement; sustainment vulnerable to funding cut	Tsunami could be supported by other UN bodies and donors if alignment to their objectives	Large-scale economic crisis could jeopardise tsunami EWS

Further Considerations when developing MTS

- ❑ More succinct MTS?
- ❑ Add graphics to make MTS an interesting read?
- ❑Who should work on what section?
- ❑Next steps and timeline?

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THANK YOU