Short Summary

on the activities of

TOWS Task Team - Development of Global Tsunami Performance Monitoring Framework

by Dr. Öcal Necmioğlu

NEAMTWS Representative

The main responsibility of this task team is to review the current PTWS performance monitoring framework, compare this with other / similar ICG initiatives and develop a consistent global performance monitoring framework. This is not a straight forward task, as there is a need to ensure similarity/harmonisation for accurate comparison across the systems, yet flexibility for differences, where they exist.

I had been appointed long time ago to this group as a NEAMTWS representative based on my initial contributions to the "Draft Proposal for Performance Monitoring Framework of NEAMTWS Upstream Components", where at ICG/NEAMTWS-XIII TSPs were invited to adopt and implement it in an experimental phase. You may recall that TT-O ToRs at both ICG/NEAMTWS-XV and ICG/NEAMTWS-XVI mandated to continue to improve the draft proposal, also.

Due to the COVID-19, the activities of the group were not initiated fully, and it was only this year in May where the wheels started turning again. Having said that, in contrary to our previous understanding, we realised soon that the scope of this work exceeds the performance monitoring of upstream components of a TWS, and aims to deal with

- Understanding and managing tsunami hazard and risk
- Tsunami detection, warning & dissemination
- Enhancing tsunami preparedness for effective community response
- International coordination and cooperation

in a broader context.

I strongly believe that the NEAMTWS input requires a harmonised effort among ourselves, as I think it's our critical obligation to ensure that the harmonised global performance monitoring framework would not overlook specific boundary conditions/limitation of NEAMTWS.

A dedicated NEAMTWS-SC meeting was held on 14 July to address this need. In summary,

- agreed to contribute actively to the Development of Global Ocean Performance Monitoring,
- noted that several documents and processes to factor / consider e.g. Ocean Decade, Tsunami Ready, existing ICG/NEAMTWS & Secretariat performance monitoring etc.
- Opportunity to understand/develop a common framework, but there is a need to exercise flexibility, respecting certain boundary conditions/context of each ICG,
- Noted the complexity across the EWS chain and elements-outside individual WGs / TTs mandate and capacity,
- Need to act one level up above WGs / TTs,
- Need a team with strong experience, noting unfortunately that the same experts are contributing to ICG/NEAMTWS activities,
- Strong input from WG 4 / Tsunami Ready Team would be desirable, noting the focus on Tsunami Ready

Agreed Actions on 14 July 2021 Meeting

Action 1: Establish an informal Team on the Development of Global Ocean Performance Monitoring (GOPM). Members of the new team '*preferably', but not limited to* one of the existing co-chairs of WGs and TTs. The GOPM Team can be formalized at the ICG/NEAMTWS-17 session in Nov 2021 ahead of the global discussion at the next TOWS-WG meetings in Feb 2022.

Action 2: WG 4 / TR Team to propose a member (preferably one of the co-chair) by Friday 16 July.

Action 3: Ocal to find out from other ICGs how they are approaching this rather complex and demanding task e. g structure and organization.

- WG4/TR is unfortunately not in a position to support leading this activity.
- Current co-chair of TT-O dr. Alessio Piatanesi kindly offered his support.
- PTWS has a Task Team Future Goals, and Performance Monitoring. At other IVG's, it seems that efforts is being coordinated through individuals.

The near-final version of related documents have been uploaded on the ICG/NEAMTWS-XVII website.

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION of UNESCO

UNESCO Intergovernmental Oceanographic Commission (IOC) – Global Tsunami Performance Monitoring Framework

This assessment table details the criteria for monitoring the performance of TSP's, NTWC's and overall tsunami risk management activities of the ICG/PTWS, ICG/IOTWMS, ICG/CARIBE-EWS, and ICG/NEAMTWS.

There are five main goals that align with the strategic plans of the four ICG's. Each goal has targets that need to be achieved and associated activities and measures.

This framework is aligned with the Pacific Tsunami Warning and Mitigation System (PTWS) strategy 2022-2030, the United Nations Ocean Decade of Ocean Science for Sustainable Development (2021-2030), and IOC Strategy that identifies early warning systems as an important part of its strategic vision – 'Framework for Global Tsunami and Other Ocean Hazards Warning and Mitigation Systems' In addition the framework is closely aligned with the priorities for action and global targets of the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030, to ensure international alignment with best practice tsunami risk management, to measure the status against requirements and assist with obtaining resources for continued improvement. Specifically, these measures aim to align with Global Target (g) to substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments by 2030.

MISSION: *To operate a modern and effective global tsunami warning and mitigation system based on global ICG and Member State participation. A key focus is to substantially improve community access to tsunami hazard and risk information, resulting in prepared, aware and resilient countries at risk of tsunami. Subsequently, we agree to work together, to reduce risk and build resilience to tsunami hazards.*

GOAL 1: Understanding and Managing Tsunami Hazard and Risk

All Member States understand their tsunami risk in all its dimensions including vulnerability, exposure of persons and assets, the many possible and/or likely tsunami hazard scenario and their characteristics, event frequency, uncertainties, and associated consequences. Such knowledge should be translated into prevention, mitigation, preparedness and response planning activities.

GOAL 1 TARGETS	
The aim is to be 100% compliant with each target below	
1.1	**Develop** methodology and supporting guidance for the modelling of and designation of tsunami inundation and evacuation zones.
1.2	**Complete** tsunami inundation and evacuation zone mapping
1.3	**Implement and designate** tsunami evacuation zones.
1.4	**Develop methodologies** for tsunami hazard risk assessments developed including multi-scenario, location-based risk assessment of tsunami hazard characteristics vulnerability, exposure, likelihood and consequences.
1.5	**Conduct** and periodically review tsunami hazard risk assessments, using agreed methodologies.
1.6	**Translate** risk assessment findings to the appropriate stakeholders and sectors.
1.7	**Strengthen** technical and scientific capability to support locally informed risk assessments.
1.8	**Improve** the translation of scientific information and data into hazard risk assessments to inform and build on existing knowledge and identify gaps.
1.9	**Identify and plan** for ways to reduce tsunami risk in the short, medium, and long term, including, for example, through the development of measures such as land use, maritime planning, critical facilities/infrastructure, and structural standards.
1.10	**Ensure** national and local tsunami response plans have a risk-based approach and relate to the risk assessments.
1.11	**Assess** ways to reduce, transfer, avoid, control, or accept tsunami hazard risk

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION of UNESCO

GOAL 2: Tsunami Detection, Warning & Dissemination

All Member States with at risk coastal communities receive timely, accurate, reliable, and effective warnings for all tsunami sources

GOAL 2 TARGETS	
2.1	**Build** and sustain seismic and other observational network coverage necessary to rapidly detect and analyse all potential tsunami sources.
2.2	**Enhance**, where appropriate, observational networks to rapidly detect and analyse all potential tsunami sources.
2.3	**Ensure** monitoring and detection networks are founded on robust scientific information
2.4	**Make seismic (real-time)** and other observational seismic data needed for rapid tsunami source detection and evaluation, available freely from seismic monitoring networks, accurately and timely to TSPs and NTWCs available from seismic monitoring networks.
2.5	**Make sea level (real-time)** and other observational data needed for rapid confirmation, characterization, and monitoring of tsunami waves available freely from monitoring networks, accurately and timely to TSPs and NTWCs from monitoring networks.
2.6	**Promote** the application of simple and low-cost early warning equipment and facilities and broaden release channels for tsunami early warning information
2.7	**Invest in, develop, and maintain** tsunami hazard, multi-sectoral forecasting, and early warning systems.
2.8	**Provide** tsunami threat information to Tsunami Warning Focal Points (TWFPs) and NTWCs for each Member State with coastal communities at risk by TSPs.
2.9	**Build** the capability and capacity to analyse seismic and other appropriate data to quickly detect, locate, and determine the magnitude and focal mechanism of potentially tsunami-genic earthquakes.
2.10	**Perform** analyses based on seismic, sea-level, and other appropriate data to forecast tsunami impacts within their respective coastal areas of responsibility.
2.11	**Compose** and issue timely and accurate products to TWFPs and NTWCs of Member States by TSPs.
2.12	**Issue** timely, accurate, reliable, and effective products regarding potential and confirmed tsunami threats to at risk coastal communities, by TWFPs and NTWCs.
2.13	**Perform** analyses to rapidly detect and then accurately characterize potential tsunami sources.
2.14	**Develop** national 24/7 capability to receive or generate tsunami threat information and issue tsunami warnings to coastal communities at risk.
2.15	**Establish** multiple channels to receive tsunami warnings for coastal communities at risk
2.16	**Developing** and investing in multi-channel, public alerting systems for effective dissemination of threat advice
2.17	**Stay** abreast of emerging science regarding tsunami early warning
2.18	**Ensure** local source tsunami is considered and effectively managed given reduced warning times
2.19	**Develop** open source and open platforms for detection systems to remove barriers or interdependencies**.**

GOAL 3: Enhancing tsunami preparedness for effective community response

All Member States strengthen tsunami preparedness and awareness for more effective response and recovery.

GOAL 3 TARGETS	
3.1	**Develop**, promote, and use national, regional, and local public education strategies and campaigns
3.2	**Develop** specific guidance developed for local source natural warning signs and associated preparedness plans
3.3	**Collaborate** with all relevant stakeholders through the involvement of national/local government, the private sector, community-based organizations and non-governmental organizations in tsunami planning and preparedness activities.
3.4	**Develop and establish** tsunami evacuation zones, signs, routes, and maps in conjunction with community engagement.
3.5	**Develop and establish** supporting documents to identify and promote tsunami inundation areas, evacuation zones, signs, routes, and maps.
3.6	**Ensure** all cultures and ethnicities are considered when creating evacuation maps, safe routes, and sign locations, developed in appropriate country specific formats (bi-/multi-languages considered)
3.7	**Establish** monitoring and evaluation instruments/documents for member states regarding the development and implementation of preparedness, awareness, and response strategies
3.8	**Provide** support to countries with local source tsunami risk, to complete local source tsunami drills/exercises
3.9	**Conduct** tsunami evacuation drills and exercises using a multi-stakeholder approach at all levels
3.10	**Facilitate** ocean basin-wide exercises by ICG Systems and support ICG-Countries to engage and 'play'.
3.11	**Consider** bespoke risk management tools for at risk communities of local source tsunami e.g., vertical evacuation structures

GOAL 4: Tsunami Event Response and Recovery	
All Member States strengthen and align with emergency management authorities/service providers to ensure effective and efficient response and recovery.	
GOAL 4 TARGETS	
4.1	**Test** response systems regularly including all responding agencies and stakeholders **-** *Regularly improve* and assess adequacy of response systems
4.2	**Establish** functions and procedures for responding agencies
4.3	**Build** adequately trained response functions
4.4	**Build** strong relationships for improved response and recovery
4.5	**Develop, manage, and function** Emergency Operation Centres (EOC's)
4.6	**Undertake post event analysis** by evaluating, recording, and integrating tsunami related impacts and losses into assessments to improve knowledge of tsunami hazard frequency and impacts and response functions.
4.7	**Use** post event analysis to improve response functions, relationships, and collaboration
4.8	**Develop** and embed tsunami recovery plans at the national, regional, and local level

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

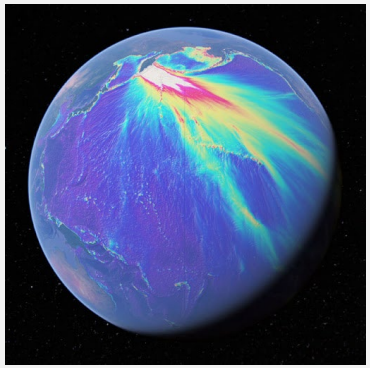
INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION of UNESCO

GOAL 5: Global Ocean Coordination, Cooperation and Partnerships	
All Member States work together to detect tsunami threat and build capacity and capability to respond	
GOAL 5 TARGETS	
5.1	**Develop** strategies, plans and relationships to enhance capacity and capability to respond to tsunami threat and ensure coherence with the Ocean Decade tsunami theme
5.2	**Ensure** the pillars of the IOC Tsunami Programme are embedded and demonstrated in local and regional tsunami risk management strategies and plans
5.3	**Develop** programmes and initiatives for the transfer and exchange of science, technology, and innovation for tsunami hazard risk management (response, reduction, readiness, recovery etc)
5.4	**Develop**, through co-ordinated in country approaches, global progress reports for UNESCO-IOC
5.5	**Measure** and analyse the progress of global agendas, strategies, and work programmes. This will lead to new and improved initiatives.
5.6	**Share** learnings and insights from Tsunami Evacuation Maps, Plans and Procedures (TEMPP) and Tsunami Ready (or other in country initiative that has the same activities and intentions as Tsunami Ready)

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

2021 2030 United Nations Decade of Ocean Science for Sustainable Development



DEVELOPMENT OF A GLOBAL OCEAN PERFORMANCE MONITORING FRAMEWORK

Task Team Meeting 3

SARAH-JAYNE MCCURRACH (NZ)

ICG/PTWS WG1 CO-CHAIR
ICG/PTWS TT CHAIR PTWS KPI

MEETING AGENDA:

1. Update from Sarah-Jayne
2. Any relevant updates from ICG's relevant to Task Team
3. Agree on approach to measure development
4. Agree to work on measure development outside of meeting by Dec 17 2021.
5. AOB

United Nations Educational, Scientific and Cultural Organization · Intergovernmental Oceanographic Commission

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION of UNESCO

UNESCO Intergovernmental Oceanographic Commission (IOC) – Global Tsunami Performance Monitoring Framework

This assessment table details the criteria for monitoring the performance of TSP's, NTWC's and overall tsunami risk management activities of the ICG/PTWS, ICG/IOTWMS, ICG/CARIBE-EWS, and ICG/NEAMTWS.

There are five main goals that align with the strategic plans of the four ICG's. Each goal has targets that need to be achieved and associated activities and measures.

This framework is aligned with the Pacific Tsunami Warning and Mitigation System (PTWS) strategy 2022-2030, the United Nations Ocean Decade of Ocean Science for Sustainable Development (2021-2030), and IOC Strategy that identifies early warning systems as an important part of its strategic vision – 'Framework for Global Tsunami and Other Ocean Hazards Warning and Mitigation Systems' In addition the framework is closely aligned with the priorities for action and global targets of the Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030, to ensure international alignment with best practice tsunami risk management, to measure the status against requirements and assist with obtaining resources for continued improvement. Specifically, these measures aim to align with Global Target (g) to substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments by 2030.

MISSION: *To operate a modern and effective global tsunami warning and mitigation system based on global ICG and Member State participation. A key focus is to substantially improve community access to tsunami hazard and risk information, resulting in prepared, aware and resilient countries at risk of tsunami. Subsequently, we agree to work together, to reduce risk and build resilience to tsunami hazards.*

GOAL 1: Understanding and Managing Tsunami Hazard and Risk

All Member States understand their tsunami risk in all its dimensions including vulnerability, exposure of persons and assets, the many possible and/or likely tsunami hazard scenario and their characteristics, event frequency, uncertainties, and associated consequences. Such knowledge should be translated into prevention, mitigation, preparedness and response planning activities.

GOAL 1 TARGETS	
The aim is to be 100% compliant with each target below	
1.1	**Develop** methodology and supporting guidance for the modelling of and designation of tsunami inundation and evacuation zones.
1.2	**Complete** tsunami inundation and evacuation zone mapping
1.3	**Implement and designate** tsunami evacuation zones.
1.4	**Develop methodologies** for tsunami hazard risk assessments developed including multi-scenario, location-based risk assessment of tsunami hazard characteristics vulnerability, exposure, likelihood and consequences.
1.5	**Conduct** and periodically review tsunami hazard risk assessments, using agreed methodologies.
1.6	**Translate** risk assessment findings to the appropriate stakeholders and sectors.
1.7	**Strengthen** technical and scientific capability to support locally informed risk assessments.
1.8	**Improve** the translation of scientific information and data into hazard risk assessments to inform and build on existing knowledge and identify gaps.

United Nations Educational, Scientific and Cultural Organization · Intergovernmental Oceanographic Commission

UNESCO Intergovernmental Oceanographic Commission (IOC) – Global Tsunami Performance Monitoring Framework

Assessment Table

GOAL 1: Understanding and Managing Tsunami Hazard and Risk

All Member States understand their tsunami risk in all its dimensions including vulnerability, exposure of persons and assets, the many possible and/or likely tsunami hazard scenario and their characteristics, event frequency, uncertainties, and associated consequences. Such knowledge should be translated into prevention, mitigation, preparedness and response planning activities.

GOAL 1 TARGETS		The '%' gained will be analysed based on the answers provided. A country will not automatically get 0/25/50/100% as seen below. Their % achieved ranked on the heat bar based on information given in the online assessment. E.g. 39% would fall between column 1 and 2. Examples will need to be provided by the user when answering the Q's.		
The aim is to be 100% compliant with each target below		0%-25%	25-50%	50-100%
1.1	Develop methodology and supporting guidance for the modelling of and designation of tsunami inundation and evacuation zones.	No methodology, no supporting guidance	Methodology developed, no supporting guidance	All complete
1.2	Complete tsunami inundation and evacuation zone mapping	Inundation modelling complete, no evacuation zones	Modelling complete, proportion of zones mapped	All zones modelled for inundation and maps for all areas developed
1.3	Implement and designate tsunami evacuation zones.	<20% of evacuation zones designated	20-50% of evacuation zones designated	>50% of evacuation zones designated
1.4	Develop Methodologies for tsunami hazard risk assessments including multi-scenario, location-based risk assessment of tsunami hazard characteristics vulnerability, exposure, likelihood and consequences.	No risk assessment methodology	Risk assessment methodology established, but not fully complaint with target - partially complete.	Fully compliant tsunami risk assessment methodology as per target
1.5	Conduct and periodically review tsunami hazard risk assessments, using agreed methodologies.	No review period in place	One review completed, no periodic review cycle in place.	Actively reviewing risk assessment, on agreed periodic cycle

TIMELINE/NEXT STEPS FOR DELIVERY

1. Task Team members to finalise measures by December 17 2021. Excel spreadsheet to be sent to all Task Team members.
2. Sarah-Jayne to review and finalise measures and assessment table by 20 January 2022.
3. Task Team members agree to develop corresponding doctrine i.e. reports and survey templates
4. Sarah-Jayne to develop a report for the 'Working Group on Tsunamis and Other Hazards Related to Sea-Level Warning and Mitigation Systems (TOWS-WG)' to be held in February 2022. The report will summarise the work of the Task Team have completed and also include:
    - Proposed Global KPI Framework
    - Assessment table
    - Request for funding to develop suitable, online reporting template
    - Further recommendations for endorsement
5. Task to review the above by 20 January 2022.
6. Next Task Team meeting will be held 20 December 2021.