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THE OCEAN DECADE TSUNAMI PROGRAMME SCIENTIFIC COMMITTEE

Fifth Meeting

16–17 January 2025
Paris, France

UNESCO

Contents

1.0 OPENING

The 5th Meeting of the Ocean Decade Tsunami Programme Scientific Committee (ODTP-SC) was opened by Bernardo Aliaga, Head of the Tsunami Resilience Section. Referring to his email on 15th January, it was proposed that members of the ODTP-SC consider electing an acting Chairperson at the beginning of the session to preside over the meeting. This election was necessary to replace Srinivas Kumar, who has rejoined the IOC Secretariat as Head of the IOTWMS Office and would therefore step down as ODTP-SC Chairperson. The Secretariat proposed to submit the name of the elected Chairperson to the IOC Chairperson—following the session—via the appointed TOWS-WG Chair, Prof. Amr Hamouda (Egypt), for confirmation The confirmed Chairperson would serve the remainder of the SC term until the next session in January 2026.

The ODTP-SC agreed with the proposal and elected Silvia Chacon, from the National Tsunami Warning System at the National University of Costa Rica, as the acting Chairperson of ODTP-SC. She thanked the members for nominating her as interim Chairperson of ODTP-SC and highlighted the significant progress achieved since the 4th ODTP-SC meeting and the remaining work to be accomplished.

2.0 UPDATES

2.1 2024 Ocean Decade Conference Barcelona Outcome Statement. Vision 2030: White Paper of "WG-6: Increase Community Resilience to Ocean Hazards": DCC-CR & DCC-IOR

The ODTP-SC noted the key elements of the WG-6 White paper presented by Srinivas Kumar which was given at the 2024 Ocean Conference in Barcelona in April 2024. The White paper was extended from coastal hazards to coastal risks and MHEWS. There are components of coastal resilience-risk assessment/ risk reduction. The White paper-ambition and main outcome is people centered EWS-muti stakeholder consultation. Other outcomes are design adaption strategies and lead to OD Goal of Safe Ocean. The paper highlights a framework for advancing Climate Resilience (CR) through key actions such as risk assessments, integrating coastal resilience into SDGs (11, 13, 14), and reviewing requirements for addressing additional hazards. It emphasizes technological and innovative solutions, adequate infrastructure, priority datasets, and partnerships to drive progress. Milestones include identifying stakeholders, generating knowledge, and fostering collaboration. Indicators of success include improved knowledge sharing, adoption of best practices, stronger partnerships, and institutional changes.

Opportunities for engagement lie in leveraging platforms like ODTP Goals, MHEWS, TEWS, and collaborating with WG 6 and ICGs to co-design CR goals and address barriers, particularly through initiatives like DCC-CR.

The collaboration between ODTP-SC and WG-6 focuses on integrating goals such as warning systems and community resilience with Ocean Decade Challenge 6 outcomes, including people-centered Multi-Hazard Early Warning Systems (MHEWS) and adaptive planning strategies. Tsunami Early Warning Systems (TEWS) are a foundational framework for developing user-centric MHEWS to enhance coastal resilience. Key areas of collaboration include:

- Developing open, accessible systems for risk assessment and management.
- Aligning coastal resilience targets with the Sustainable Development Goals (SDGs).
- Initiating reviews of coastal resilience requirements.
- Establishing performance monitoring frameworks.
- Strengthening stakeholder collaboration among WG-6, ODTP-SC, Decade Coordination

Centers (DCCs), and Intergovernmental Coordination Groups (ICGs) for joint projects, capacity development, and exchanging best practices.
- Advancing a DCC-CR and DCC-IOR proposal for the next Ocean Decade Call for Action, informed by WG-6 White Paper recommendations.

Discussions emphasized global initiatives like MHEWS, EW4All, and CREWS, which provide a guiding framework for multi-hazard approaches. Examples highlighted include addressing ocean hazards (tsunamis, storm surges, high waves, swell surges) with warnings based on coastal inundation impacts, independent of the source mechanism. There is a new publication (Words into Action: A Guide to MHEWS) published by WMO/UNDRR involving key partners, including UNESCO-IOC showcasing MHEWS. Discussions mentioned the gaps in SDG related to this subject and the need for inclusion of coastal resilience targets.

2.2 Second UNESCO-IOC Global Tsunami Symposium: Way Forward?

Dr. Srinivas Kumar, the new Technical Secretary for IOTWMS, updated the ODTP-SC participants on the 2nd UNESCO-IOC Global Tsunami Symposium. The group then discussed the summary report for the 2nd UNESCO-IOC Global Tsunami Symposium: Two Decades After the 2004 Indian Ocean Tsunami: Reflection and the Way Forward. The report, prepared by the Secretariat, includes sections on the background, objectives, session summaries (covering status, gaps, and future priorities), and a conclusion. The draft report will be reviewed by the co-chairs of the programme committee and chairs of the individual sessions before being presented at the TOWS meetings on 24-25 February 2025. The Technical Secretary of IOTWMS is coordinating the review process with the co-chairs and has already received feedback. However, the summary report has not yet been shared with the session speakers. The Scientific Committee noted that the Global Tsunami Symposium is a scientific meeting and expressed that there should be no concerns on meteo-tsunamis being discussed in the report.

Once the report is finalized, it will be put up to the TOWS-WG for approval, following which recommendations needs to be considered by the ODTP-SC. A key recommendation was to organize an online meeting to consider the future priorities defined by the 2nd UNESCO-IOC Global Tsunami Symposium in the ODTP-SC work plan. The Scientific Committee also recognized and expressed its appreciation to Harkunti Pertiwi Rahayu, Research Center for Disaster Mitigation, Institute of Technology Bandung, Indonesia, for her outstanding leadership in coordinating and organizing the 2nd UNESCO-IOC Global Tsunami Symposium.

2.3 Decade Collaborative Centers. What, how, when to best engage?

The ODTP-SC addressed the questions concerning how best to engage with the Ocean Decade Collaborative Centers. The group reviewed the status of collaboration with DCCs especially in terms of engaging in respective meetings, for example at 57th IOC Executive Council (June 2024) side event on Coastal Horizons: Pathways and Actions to Strengthen Resilience to Coastal Hazards. There is a need for enhanced collaboration with DCCs and leveraging their work plans, particularly in thematic areas like DCC-CR and tsunami-related actions. Participants emphasized learning from successful collaborations, such as those related to typhoons, and integrating Disaster Risk Reduction (DRR) into Marine Spatial Planning (MSP), urban planning. There was a focus on aligning DCC actions with ODTP goals, including observations linked to tsunamis and promoting the Tsunami Ready Recognition Programme (TRRP). Challenges include coordinating efforts, defining mandates, and establishing clear processes for collaboration, particularly with other initiatives like MHEWS, UN Habitat's, Marine Spatial Planning (MSP) and MCR2030 planning. The group also discussed the importance of tools for coastal prediction, strategic coordination of resources, and addressing sea-level hazards.

Moreover, it was agreed to adopt an opportunistic, adaptive and strategic collaborative approach to achieve shared objectives, including prioritization as there are many DCCs, and to coordinate where possible with respective Tsunami Resilience Section thematic leads e.g. Denis Chang Seng on MHEWS,

Ocal Necmioğlu on Joint Collaborative Board (JCB) and Srinivas Kumar Tummala on coastal hazards.

2.4 Update on current work programmes of TOWS-WG Task Team on Tsunami Watch Operations and Task Team on Disaster Management and Preparedness

The ODTP-SC noted the ongoing work and progress presented by Denis Chang Seng and Ocal Necmioglu of the TOWS-TT-DMP and TOWS-TT-TWO respective initiatives for the intersessional period and welcomed the planned efforts as reflected in respective upcoming TOWS TTs agendas focused on the UNESCO-IOC Tsunami Ready Recognition Programme while fostering synergies with local and national initiatives, and the development of a comprehensive toolkit to support the Tsunami Ready Recognition Programme. It noted the planned conversations on future policies and strategies for implementing Tsunami Ready, and discussions focused on enhancing tsunami services for events occurring outside ICG Earthquake Source Zones, creating tailored products for the maritime community, and advancing Standard Operating Procedures (SOPs) for tsunamis generated by non-seismic sources (tsunami generated by volcanoes, meteo-tsunami and other non-seismic sources), as well as the ceasing of fax transmission for tsunami products.

The meeting took the opportunity to further discuss multi-hazard instrumentation, especially focusing on sea level gauges. It noted that several tide gauges have been installed recently in a couple of countries with additional sensors for MHEWS benefits. It further noted that TSR/GLOSS is installing two new high quality tide gauges in Morocco (Tan-Tan) and Egypt (Alexandria) and conducting a training course with CoastWAVE project support. The meeting highlighted the following key developments:

- The WMO-IOC Joint Collaborative Board (JCB), 4-6 September 2024, during its last meeting, discussed issues related to the definition of meteotsunamis.
- The Tsunami Glossary 2024 is currently under review by the IOC Documentalist. A revised definition of "meteotsunami" will not be included in the 2024 revision.
- The UNESCO-IOC Technical Series 200 on meteotsunamis, prepared by the Meteotsunami Ad-Hoc Team led by Mike Angove, is nearing publication, pending final review by the WMO SC-MMO.
- It is recommended that the TOWS-WG circulate the Meteotsunami (MT) Technical Series Document to the Member States and organize webinars on meteotsunamis, similar to the approach taken with the TS 183 Monitoring and warning for tsunamis generated by volcanoes.
- A further recommendation was made for the TT DMP to consider discussions on inclusive Standard Operating Procedures (SOPs) for disabled persons.
- The GOOS–IODE Data Management and Sharing initiative is under development and will be presented at the IOC Assembly, 25 June-3 July 2025. TRS and tsunami community to follow initiative to address tsunami-related data requirements.

2.5 Tsunami Ready Coalition ODTP Implementation Plan

The draft Implementation Plan of the Tsunami Ready Coalition (TRC) was presented by the Chair of the TRC, Laura Kong, to the ODTP-SC for their feedback prior to presentation to the TOWS-WG in February 2025. The Plan outlines its establishment, mandate, objectives, Terms of Reference (ToR), action plan, governance, proposed membership and communications plan. The TRC is a collaborative effort involving global, regional, and Member State stakeholders to advance UNESCO-IOC's Tsunami Ready Recognition Programme, aligned with the UN Ocean Decade Tsunami Programme's goal of ensuring 100% of at-risk communities are tsunami-prepared and resilient by 2030. The Coalition aims to build a network of key stakeholders to promote and support Tsunami Ready through advocacy, resource mobilization, networking, and guidance. Reporting to the TOWS-WG, the TRC will have a small, diverse membership, primarily institutional, by invitation from UNESCO-IOC. The plan proposes four objectives:

- **Objective 1**: Raise the Profile of TRRP in Collaboration with Critical Stakeholders, Short-term focus (2 years).
- **Objective 2**: Increase Funding Resources for TRRP Implementation, Medium-term focus (5 years)
- **Objective 3**: Advocate for the conduct of Tsunami Ready Indicator Workshops in the Regions, Medium-term focus (5 years)
- **Objective 4**: Effectively Organize the Tsunami Ready Coalition (ongoing)

A list of proposed activities aligned with the defined objectives was presented, emphasizing the identification of relevant institutions for advocacy and implementation as the first critical step. This would be followed by efforts to increase funding resources for the implementation of the TRRP. It was proposed that regional TRRP workshops be conducted with the support of the TRC. The ODTP-SC discussions and suggestions included:

- Recommending that the TRC Implementation Plan incorporate a focus on sustainability, particularly the renewal process, and explore external assistance needs from Member States to sustain the TRRP.
- Organizing ICG-led training sessions focused on individual Tsunami Ready indicators.
- Establishing a basic and relatively small governing structure for the TRC to ensure effectiveness.
- Clarifying the definition of the "Coalition" and the role of "Ambassadors." TRRP Ambassadors can serve in a complementary role to the Coalition leadership.
- Including a clear and effective TRC communication and outreach plan.
- Requesting the Secretariat to share revised draft Plan with TTDMP members for review and input during the 2025/02 TTDMP meeting. It is important to achieve consensus to ensure progress.
- Requesting the TOWS-TTDMP to review and endorse the Plan (20-22 February 2025), and the TOWS-WG to note and endorse its core elements (24-25 February 2025).
- Noting that resourcing would be required to manage the Implementation Plan, and that this should be included in the recommendations to TOWS-WG.

The ODTP-SC expressed appreciation for the proposed Implementation Plan. The TRC Chair thanked the ODTP-SC for their comments and will review and incorporate them into the Plan.

3.0 PROGRESS IN IMPLEMENTING THE ODTP

3.1 Monitoring and tracking progress in implementing the Ocean Decade-endorsed actions

The ODTP-SC expressed its appreciation for the work carried out by IOC/TSR in monitoring and tracking ODTP-related actions presented by Denis Chang Seng to this end. It also acknowledged the improved coordination and liaison between the TSR ODTP Focal Point, the respective Technical Secretaries, and the ICGs regarding the submission of OD actions. The following recommendations were made:

- Improve Reporting: Strengthen the connection between reporting and future ODTP KPIs by incorporating summary tables. These tables will facilitate easier reading and enable better-informed decision-making.
- Enhance Communication and Awareness: Increase communication efforts to raise awareness of the ODTP-approved actions within the respective ICGs.
- Strengthen Connections: Provide a formal letter to link project leads with ODTP members, facilitating follow-up actions and stronger collaborations.

- Build a Community of Partners: Build/Strengthen a community of partners contributing to the ODTP. As proposed in agenda item 6, organize a webinar to bring partners together and strengthen their connections with the ODTP.

3.2 Focus on TRRP – estimating our target: methodology to identify administrative units ("communities") eligible for the TRRP and assess the level of risk of each community.

Dr. Matthieu Péroche and Dr. Marion Le Texier introduced the ongoing work in developing a Methodological Protocol for Tsunami Risk Ranking at the Community Level in the Caribbean Basin, with the potential for global scaling if feasible, commissioned by the TSR. The main objective is to determine the number and population of communities that could apply for IOC-UNESCO Tsunami Ready recognition, rank evacuation needs, rank Tsunami Hazard Exposure and rank Tsunami Risk.

The presented methodological approach is based on integrating homogeneous geospatial data at the ocean basin scale and creating a hazard index that characterizes the intensity of the physical phenomenon, particularly the wave amplitude near the coast. This approach aims to assess the exposure of coastal communities, and the challenges related to tsunami evacuation.

In this assessment, a community corresponds to the smallest available administrative unit at the state level, identified using reliable, open, and open-source cartographic databases. Depending on the territory, it may be a municipality, parish, district, or another local administrative division. This administrative unit should be compatible with the possibility of applying for IOC-UNESCO *Tsunami Ready Recognition.*

Preliminary results have identified a universe of 946 communities potentially eligible for UNESCO-IOC "Tsunami Ready" recognition in the Caribbean, with varying degrees of evacuation challenges. Another key figure highlights the potentially exposed population of this same universe, with an estimated 16,300,000 people living in the 30m evacuation zone and 13,000,000 people in the 15m evacuation zone. The study proposes a composite index of hazard exposure (considering scenarios available under CATSAM) and evacuation needs, combining the Tsunami Hazard Index (THI) and the Tsunami Evacuation Needs Index (TEVI), to prioritize at-risk communities. The objective was to define a list of very-high tsunami risk and high tsunami risk communities, out of the universe above defined. An initial attempt produced 8 communities with a very high tsunami risk index and 64 communities with a high tsunami risk index. To ensure the reliability of the results, the study emphasizes the necessity of precise evacuation zoning and robust demographic data. One of the major challenges identified lies in inconsistencies within topographic and demographic data sources, as well as the limitations of tsunami propagation models, particularly in complex coastal environments. It should also be noted that the hazard assessment relies on scenarios modeled within CATSAM, which, while comprehensive, do not account for localized amplification effects due to bathymetry or coastal morphology**.** It is crucial to harmonize the selection of evacuation zones based on the exposure to the reference hazard specific to each community, and short-term actions are being implemented to address these issues. The project underscores the importance of a standardized and replicable methodology to facilitate its implementation in other regions. This work aims to primarily raise awareness among decision-makers and stakeholders about tsunami risk exposure at the community level. Rather than providing directly actionable results, it highlights priority areas that may require further local assessments and tailored preparedness measures. By identifying communities with the highest theoretical risk, this study serves as a preliminary step to encourage engagement in the Tsunami Ready process and foster discussions on improving local risk reduction strategies. Exploratory avenues are being considered to refine risk indicators by integrating parameters such as evacuation times, tsunami arrival times (based on TsuCat results), and land use data. However, the authors remind that increasing the complexity of indicators can lead to greater uncertainty and make their interpretation more challenging, necessitating a careful communication of the results to stakeholders.

A detailed presentation is available here.

The ODTP-SC discussed several matters, including the challenges of estimating evacuation ability and temporal evacuation. Work is ongoing and subject to data availability. It was noted that mismatched grids, resulting from coefficients determined and the use of GEBCO, present challenges, as do the limitations of Green's Law in areas with dense islands. Two approaches are available:

- Probabilistic Analysis – A very complex task.
- Case Studies with Parameter Adjustments – This involves changing parameters to improve the reliability of results.

It was emphasized that the study addresses the basic needs of the TRRP and should avoid excessive detail. The work is valuable for disaster risk managers as it provides a mechanism to support decision-making. The ODTP-SC proposed the following key suggestions/ recommendations:

i. Include additional elevation thresholds (to define inundation areas) and remove the CARIBE WAVE scenarios from the analysis. Consider only scenarios based on literature and expert meetings.
ii. Noting that CATSAM was developed as a visualization tool, it is advised to employ TsuCat instead to obtain critical parameters, such as wave amplitude at the coast.
iii. Present results with a disclaimer, advising Member States to conduct finer-scale analyses at the national level. Elevation parameters, such as inundation height limits, should be defined by the decision-maker.
iv. Clearly explain and communicate the purpose and specific application of the study and results.
v. Highlight that the study comprises two components: defining the number of communities and people at risk (based on wave amplitude) and assessing their exposure.
vi. Perform a scientific peer review to ensure the indices developed are accepted as a scientifically credible methodology.

Overall, the ODTP-SC appreciated the work commissioned by the IOC/TSR on a Methodological Protocol for Mapping, Identifying and estimating administrative units ("communities") eligible for the TRRP and assess the level of risk of each community in the Caribbean Basin and its wider application in other ocean basins/ICGs.

4.0 REVIEW LIST OF NEW SUBMITTED/ ENDORSED ACTIONS RELATED TO ODTP (CALL 7)

The ODTP-SC expressed its appreciation regarding the update on new submitted actions related to ODTP to inform of the actions related to the ODTP presented by Denis Chang Seng. The SC welcomed the increase in the number of Ocean Decade Actions (7 in total) submitted for Call Number 7, of total estimated investment of 17.6 million Euros foreseen under these actions. The SC noted that only two actions have been endorsed by the ODU to this end, while others are still under consideration.

The two approved actions are:

- **IOC DG ECHO Project**: *Scaling-up and strengthening the resilience of coastal communities in the North-Eastern Atlantic and Mediterranean regions to the impact of tsunamis and other sea level-related coastal hazards (CoastWAVE 2.0, July 2024-July 2026) (approved 18 dec 2024).*
- **Tokushima University Contribution**: *Development of comprehensive tsunami software, 2024-2030 (approved 8 Jan 2025).*

The SC discussed about a possible communication mechanism to inform DCU regarding revised budget of project actions for instance the US contributions have been updated and revision of project leads.

5.0 PROPOSAL FOR AN ONLINE COORDINATION WEBINAR ON ENDORSED ODTP INITIATIVES

The ODTP-SC reviewed the roadmap presented by Bernardo Aliaga of key events organized in 2024, including the Tsunami Survivors and Eyewitnesses Events, the Roger Revelle Lecture, the 2nd UNESCO-IOC Global Tsunami Symposium, and the high-level event at HQ marking 20 years since the 2004 tsunami. The SC also noted events planned for 2025, such as the TOWS-WG meeting (February 20-25) and the ODTP-SC meeting (January 16-17). For 2025, the ODTP-SC discussed and agreed on the following initiatives:

- Webinar: Co-host a webinar with leads of endorsed projects and contributions focusing on ODTP Objective 1 (e.g., SMART cables, hydrophones, machine learning) during the 33rd IOC Assembly, June 2025.

- Conference: Collaborate on conferences addressing both ODTP's high-level objectives (technical and social aspects) at the IAPSO/IASPEI/IAVCEI Joint Tsunami Commission (JTC) International Tsunami Symposium (ITS) in Hyderabad, scheduled for November 12 – 14 , 2025.

6.0 DISCUSS ICG INITIATIVES/COORDINATION WITH RESPECT TO ODTP

Technical Secretaries and representatives from the respective ICGs discussed key initiatives related and complimenting to ODTP. Additional details are available for ICG/NEAMTWS, ICG/CARIBE-EWS, ICG/PTWS, and ICG/IOTWMS

The Steering Committee (SC) noted that the localization of the Portuguese submarine cable linking the Continent, the Azores and Madeira (CAM) in a ring system with sensors for earthquake and tsunami early warning and climate and ocean monitoring (SMART CAM) has been finalized; however, information regarding the 70 sensors appears to be exclusively available to IPMA. Another noteworthy initiative is the MISTS (Mediterranean Integrated Science and Telecom System) European Initiative. This project involves a partnership between Pacific Peering, ASN, and the scientific community. Its goal is to enhance understanding of climate, seismic, and tsunami risks while addressing challenges related to infrastructure security and illegal maritime traffic. MISTS is being designed to integrate data-driven monitoring with next-generation telecom solutions, aiming to improve regional resilience and connectivity. Currently, MISTS is a one-year research study engaging stakeholders to design a sustainable and scalable solution. The project is actively seeking collaboration to support project planning and offers opportunities for synergy with NEAM Working Groups and Task Teams. The initiative is scheduled to be presented during January 2025.

It was noted that in the NEAM region, the Task Team on Non-Seismic Tsunamis is currently not focusing on meteotsunamis. It was underlined that ICGs are still mostly focusing on seismic tsunamis and the need to focus more on non-seismic tsunamis. INGV, Italy TSP is progressing towards implementing a PTF based Decision Matrix.

The ODTP-SC welcomed the completion of the Indian Ocean Tsunami Warning and Mitigation System (IOTWMS) Capacity Assessment, with the final document set for publication soon. A policy brief has been already published by UNESCAP: . This assessment establishes a baseline and tracks progress

from 2005, 2018, and now 2024. While notable improvements were observed, some areas have plateaued.

In the Caribbean, the ODTP framework is being implemented through decisions derived from various initiatives aligned with ODTP objectives. A pilot survey on the effectiveness of Tsunami Ready was implemented during 2024. Discussions also focused on efforts required to renew Tsunami Ready (TR) Recognition, such as re-training and re-engaging representatives, re-installing evacuation signage, and addressing related challenges. Key obstacles include securing international funding and turnover in personnel. It was recommended that the National Tsunami Recognition Boards (NTRBs) ensure proper follow-up and request annual community reports. Additionally, there is a need to develop an automated instrument to facilitate reporting.

In the Pacific, the meeting discussed preparedness activities for islands with flat terrain, emphasizing the challenge of establishing vertical evacuation infrastructure. There was consensus on adopting a Small Island Developing States (SIDS)-focused approach to address these unique challenges. The PTWS is working on and will propose a TRRP equivalency approach at the next ICG/PTWS-XXXI (APril 2025). An aspect will be to emphasize TR reporting on a percentage basis instead of by absolute numbers.

The Co-chair of the Science and Society Committee, Laura Kong, of the ITU-WMO-UNESCO IOC Joint Task Force for SMART Subsea Cables submitted the JTF Roadmap, responding to ODTP-SC Task v. (Propose a roadmap for collaboration with the ITU/WMO/IOC SMART Joint Task Force cable initiative to fully explore the feasibility of widespread deployment of scientific instrumentation on deep-ocean fiber-optic cables to improve capability to rapidly detect and characterize tsunami sources as well as propagating tsunami wave fields.)

A significant emphasis was placed on the need for standardized reporting at the Member State/ICG level, enabling comprehensive global compilation by the IOC/TSR.

7.0 ODTP-IMPLEMENTATION PLAN: DEVELOPING A REFINED IMPLEMENTATION PLAN/ MONITORING AND TRACKING TOOL.

A presentation on the work on ODTP RDI Monitoring and Tracking Tool was delivered by Denis Chang Seng. The ODTP-SC acknowledged the TOWS TT DMP recommendation in Sendai, Japan, from 19 to 20 February 2024 which specifically requested the Secretariat to develop a reporting mechanism to enable ICGs to report progress on related projects within the Ocean Decade and in alignment with the ODTP RDI KPIs, ensuring coherence with the proposed Global KPI Framework for the UNESCO-IOC Tsunami Programme.

Preparatory work is underway by the IOC/TRS Secretariat to develop the Performance Monitoring and Tracking of ODTP actions following an attempt to recruit a consultant which did not materialize. The Performance Monitoring and Tracking Tool aims to align, as closely as possible, with the Monitoring and Evaluation Framework of the United Nations Decade of Ocean Science for Sustainable Development (2021–2030) and the Global Tsunami Performance Monitoring Framework. Its design concept emphasizes the efficient and seamless use of KPIs from multiple assessment frameworks, avoiding duplication in assessments and reporting. The renewed goal is to create a single Tsunami Performance Monitoring and Tracking Tool that allows users to select their assessment application, such as ICG-KPIs, ODTP-KPIs or other uses from granular/micro to macro-level. The Pacific/ICG-KPI serves as the foundation for this tool, and KPIs derived from the ODTP RDI and others as additional layers. The core remaining task being the alignment and mapping of ODTP-RDI and other relevant (Vision 2030) indicators onto the ICG-KPI. A proposed work plan includes the following milestones:

- Gathering feedback from ODTP-SC and TOWS meetings, as well as online feedback, by August 2025.
- Developing an online platform tool by September with the expertise of a consultant.
- Conducting testing by November 2025.
- Operationalizing the tool by January 2026 to align with the next OD Monitoring and Tracking exercise, considering the possibility of using a testing group of MS.

The SC noted two levels of questions requiring attention. At operational level, who will complete the assessments? What training is required, and when will the tool be operationalized? At a strategic level how will the TRS effectively and sustainably manage the tool to ensure standardization and alignment with best practices for KPIs and performance measures (e.g., data collection, analysis, knowledge dissemination, and continuous adaptation), and what strategies and resource planning approaches can support the coordination and management of additional layers of performance monitoring and tracking, considering the TRRP's existing heavy workload and increasing demands?

The SC discussed the importance of Tsunami National Contacts (TNCs) as the primary national representatives. However, it recommended that requests be communicated through Circular Letters (CLs), to also inform Tsunami Warning Focal Points (TWFPs), National Tsunami Warning Centers (NTWC's) and IOC Focal Points. Alternatively, employing ICG structures, particularly their Working Groups (WGs), to conduct assessments was proposed.

The SC welcomed the proposal for flexible data entry by various stakeholders in liaison with TNC, as demonstrated by past survey practices in the IOTWMS. It agreed that assessments should not be mere "tick-box" exercises but should include concise text/narrative responses to KPI surveys. Clarifications are needed on how Member States with memberships in different ICGs or territories will respond to these surveys, as the SC expressed a preference for an ICG-based approach.

The SC appreciated the progress made in developing a comprehensive Tsunami Programme -ODTP–RDI Performance Monitoring and Tracking Tool with clear SMART (Specific, Measurable, Achievable, Relevant, and Time-bound) indicators and actions.

The group agreed to further advance the Tsunami Performance Monitoring and Tracking Tool and present an update at the TOWS-Working Group and Task Team meetings scheduled between 20 and 25 February 2025.

8.0 GLOBAL INITIATIVES

8.1 EW4ALL/GFDRR: ODTP involvement in theEW4All Global Multi-stakeholder Forum, 2-3 June & the Global Platform for DRR 2025 4-6 June Geneva, Switzerland

With respect to EW4ALL the SC noted IOC/ TSR efforts to engage in the EW4All Global Multi-stakeholder Forum (MSF), 2-3 June, Geneva, Switzerland. TRS is participating in the EW4ALL GSF. IOC staff were also nominated to participate in the regional EW4ALL and Regional Platform meetings, however it is not clear if IOC officers were able to engage effectively. TSR has applied to co-lead with UNDP and UNDRR session 2 on *Enable and scaling of community-led EWS* and session 5 on *Fostering international and regional cooperation and partnerships*. SC suggested to consider including topics such as: *people with disabilities, inclusive SOPs.* It is also an opportunity to advocate on the Tsunami Ready Coalition.

In the case of the 8th Global Platform for Disaster Risk Reduction (GPDRR, 2025), the SC noted that a TSR side event proposal was not successful. It is believed that TRS need to engage in the GPDRR process early and participate in the organizing teams of the GPDRR to have a greater chance of

succeeding side event proposals. The meeting further noted that the Executive Secretary may be invited by UNDRR as a speaker on the High-Level Dialogue scheduled between 4-6 June 2025, and the subject could focus on Indian Ocean Tsunami-20 years after. The group also noted that the IOC/TSR has also submitted its interest to join the roster of potential speakers for the Official Programme. Two proposals have been submitted for Ignite Stage focused on CoastWAVE project and Tsunami Ready.

8.2 UN Oceans Conference, Nice in 2025, 3rd UN Ocean Decade Conference 2027 –OTDP-SC lead initiatives

The meeting highlighted two upcoming events in Nice: the UN Ocean Conference (UNOC) and the One Ocean Science Conference (OOSC). The 2027 UN Ocean Decade Conference (UN ODC) has received proposals from several countries, which have been reviewed by the IOC Officers. A final decision on the host country is expected in the coming months.

UNOC 2025, scheduled for June 9–13, 2025, will focus on Sustainable Development Goal 14 (SDG14). However, the IOC's Tsunami Programme has limited opportunities for direct engagement, as the conference lacks significant emphasis on coastal resilience.

Silvia Chacón, the acting Chairperson of the ODTP Steering Committee, is a member of the OOSC organizing committee. Her team at SINAMOT successfully submitted two abstracts under Theme 10, both related to Early Warning Systems (EWS). Costa Rica is sponsoring 17 experts; unfortunately, she is unable to extend her stay to participate in UNOC.

8.3 International Tsunami Symposium 2025 – Hyderabad, India

An update on the International Tsunami Symposium (ITS) of the IUGG Tsunami Commission was provided online by Sunanda Manneela, from the Indian National Centre for Ocean Information Services (INCOIS), Ministry of Earth Sciences, India. The committee noted that INCOIS has initiated preliminary steps to organize ITS-2025. These steps include forming various planning committees, finalizing themes, issuing the first announcement, and issuing a call for abstracts. The ITS-2025 is planned as a three-day conference to be held from November 12–14 (post-meeting update), 2025, at INCOIS, Hyderabad, India. The central theme for the conference is *Non-seismic and Complex Sources: Challenges, Lessons Learned, and the Way Forward*. Proposed session themes include:

- Tsunami hazard, vulnerability, and risk assessment
- Paleotsunami studies
- Instrumentation and observation networks
- Tsunamigenic earthquake source mechanisms
- Non-seismic and complex tsunami sources
- Tsunami modeling
- AI/ML for tsunami early warning systems
- Field surveys
- Tsunami awareness and preparedness
- International cooperation and private partnerships

The ODTP-SC suggested adding topics related to risk communication, institutional arrangements, and governance to the agenda. It was also recalled that the Commission is sponsored by the IAPSO (Oceans), IASPEI (Seismology) and IAVCEI (Volcanology) Associations of the IUGG and should be invited to contribute, especially considering the focus of the ITS.

Recalling the proposal (Agenda 5) to co-organize the first ODTP conference back-to-back with ITS-2025, the committee emphasized the importance of recognizing these as distinct events, however strong coordination will be essential to ensure their success. The host highlighted the need to estimate the expected number of participants to determine the most suitable venue for the conference.

Otherwise, timely communication of the event, planning and obtaining approval from TOWS were identified as key priorities.

9.0 AGREE SC-ODTP 2025 WORK PROGRAMME AND INFORMATION ON ODTP-SC MEMBERSHIP

The Head of the Tsunami Resilience Section, Bernardo Aliaga, provided key highlights of the discussions and decisions of the 5th ODTP-SC. Regarding ODTP-SC membership, as per the earlier agreement, the interim ODTP-SC Chairperson will be submitted to the IOC Chairperson through the appointed TOWS-WG Chairperson, Prof Amr Hamouda (Egypt), for confirmation. The confirmed ODTP-SC Chairperson will serve for the remainder of the current SC term, which ends at the next session in January 2026.

For the 2026–2027 period, two members, Helene Hébert and Maria Ana Baptista expressed their availability to serve a second term. There will also be three available slots for TT-DMP members and two slots for TT-TWO, for which the respective Chairpersons are expected to propose candidates. Additionally, three members with scientific expertise will be proposed to the TOWS-WG Chairperson to replace Alexander Rabinovich, Mike Angove, and Sergio Barrientos. For continuity, current members are welcome to continue their involvement, however without UNESCO-IOC funding opportunities.

10.0 CLOSE

The 5th Meeting of the Ocean Decade Tsunami Programme Scientific Committee (ODTP-SC) was closed on Friday at 17:30 Paris Time.

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ANNEX

Provisional Timetable of the 5th Meeting of Scientific Committee for the UN Ocean Decade Tsunami Programme (ODTP-SC)

16-17 January 2025. HQ, Paris,

Room: TBC

	DAY 1 (16 Jan)	*Remarks/lead*
09:00-09:30	**1. OPENING**	Chairperson Head of TSR
[09:15-13:00]	**2. UPDATES**	
09:15-09:45	a. 2024 Ocean Decade Conference Barcelona Outcome Statement and Vision 2030 White Paper WG-6: Increase Community Resilience to Ocean Hazards": DCC-CR & DCC-IOR	DCU/Chair? Srinivas Kumar / Nadia Pinardi
09:45-10:30	b. 2nd UNESCO-IOC Global Tsunami Symposium: Way Forward?	Bernardo/ALL
10:30-11:00	COFFEE BREAK	
11:00-11:30	c. Decade Collaborative Centers: example DC-CR. What and how, to best engage? How much to involve/engage the ODTP?	Denis- Chang Seng
11: 30-12:00	d. Update on current work programmes of TOWS-WG Task Team on Tsunami Watch Operations and Task Team on Disaster Management and Preparedness	Tech Secretaries of TT DMP and TT TWO
12:00-13:00	e. Tsunami Ready Coalition (TRC) ODTP Implementation Plan	Chair of TRC Laura Kong
13:00-14:00	LUNCH BREAK	
14:00-15:00	**3. PROGRESS IN IMPLEMENTING THE ODTP -** Focus on TRRP – estimating our target: methodology to identify administrative units ("communities") eligible for the TRRP, and assess the level of risk of each community	Chair / All
15:00-15:30	COFFEE BREAK	
[15:30-17:00]	**4. REVIEW LIST OF NEW SUBMITTED/ ENDORSED ACTIONS RELATED TO ODTP (call 7 & 8)**	Denis Chang Seng/ALL
	REVIEW LIST OF NEW SUBMITTED/ ENDORSED ACTIONS RELATED TO ODTP (Call 7 & 8?) (CON'T) **Break Out Discussion (TBD)**	All
17:00 -17:15	**5. PROPOSAL FOR AN ONLINE COORDINATION WEBINAR OR ENDORSED ODTP INITIATIVES**	Bernardo Aliaga/ Srinivas Kumar
END OF DAY 1		

	DAY 2 (17 Jan)	Remarks/lead
09:00-10:30	**6. DISCUSS ICG INITIATIVES/COORDINATION WITH RESPECT TO ODTP**	Chairperson ICG representatives / Tech Secretaries
10:30-11:00	COFFEE BREAK	
11:00-13:00	**7. ODTP-IMPLEMENTATION PLAN: DEVELOPING A REFINED IMPLEMENTATION PLAN [MONITORING AND TRACKING TOOL]**	To be Indicated/ Consultant
13:00-14:00	**LUNCH BREAK**	
[14:00-15:00]	**8. GLOBAL INITIATIVES**	
14:00-14:30	a. **EW4ALL/DRR:** Discuss the ODTP involvement in the EW4All Global Multi-stakeholder Forum, 2-3 June & the Global Platform for DRR 2025, 4-6 June Geneva, Switzerland	Denis Chang Seng
14:30-15:00	b. **UN OCEAN**: UN Oceans Conference, Nice in 2025, and the 3rd UN Ocean Decade Conference 2027 –OTDP-SC lead	Bernardo Aliaga
15:00-15:30	c. **International Tsunami Symposium 2025** – Hyderabad, India, (TBC Sept-Nov 2025	Alexander Rabinovich / Rep of INCOIS
15:30-16:00	COFFEE BREAK	
16:00-17:00 **END OF DAY 2**	**9. SC-ODTP 2025 WORK PROGRAMME AND INFORMATION ON ODTP-SC MEMBERSHIP**	Chairperson/ Bernardo Aliaga

At its 31st session, the IOC Assembly established the "Ocean Decade Tsunami Programme" and its Scientific Committee (SC-ODTP) by Decision A-31/3.4.1. The SC developed the Draft 10-Year Research, Development and Implementation Plan for the Ocean Decade Tsunami Programme which was presented and endorsed at the 32nd session of the IOC Assembly in June 2023. The SC has an advisory role to TOWS-WG for the duration of the Ocean Decade Tsunami Programme.

The Scientific Committee is tasked with (fulfilled tasks stroked through):

TASKS	Started	Ongoing	Completed
i. Develop a Draft 10-Year Research, Development and Implementation Plan for the Ocean Decade Tsunami Programme based on the concept paper "Protecting Communities from the World's Most Dangerous Waves: A Framework for Action under the UN Decade of Ocean Science for Sustainable Development";			✓
ii. Identify and address gaps in global tsunami hazard assessment as follows			
a) comprehensive assessment to include all potential tsunamis, anywhere in the world, regardless of their source			

b) strategies to validate historical tsunami sources, through the application of paleotsunami techniques and historical seismology.			
iii. Identify gaps in tsunami detection, measurement, forecasting, with a special emphasis on tsunamis generated close to populated coastlines.			
a) comprehensive assessment to include all potential tsunamis, anywhere in the world, regardless of their source,			
b) strategies to validate historical tsunami sources, through the application of paleotsunami techniques and historical seismology.			
iv. Propose to enhance sensing and analysis strategies to enable the rapid characterization of tsunami sources through the combined use of land-based seismic and geodetic sensors, GNSS terminals, coastal sea level gauges, deep-ocean tsunameters, SMART repeaters on deep-ocean fiber-optic cables and satellite-based observations.			
v. Propose a roadmap for collaboration with the ITU/WMO/IOC SMART Joint Task Force cable initiative to fully explore the feasibility of widespread deployment of scientific instrumentation on deep-ocean fiber-optic cables to improve capability to rapidly detect and characterize tsunami sources as well as propagating tsunami wave fields.			
vi. Consider and propose strategies, programmes and content to enhance societal resilience for tsunami and other ocean hazards.			
a) build the framework needed to ensure the training and development of the next generation of technical-scientific expertise,			
b) identify strategies that allow to characterize structural and social vulnerability in tsunami hazard zones,			
c) propose strategies for promoting implementation of community preparedness initiatives such as IOC Tsunami Ready Recognition Programme to ensure 100 % at risk communities are prepared & resilient to tsunamis by 2030.			
vii. Overview the consolidation of inputs received to IOC Circular Letter 2825 on Inventory of actions being considered under the United Nations Decade of Ocean Science for Sustainable Development (2021–2030) in the field of Tsunamis and Other Sea- Level Related Hazards warning and mitigation;		✓	
viii. Submit a Draft 10-Year Research, Development and Implementation Plan for endorsement by the TOWS-WG at its 16th meeting.			✓

The SC-ODTP for the period 2024-2025 is composed of the following members:

- **Mr Michael ANGOVE**, (Retired) US National Oceanographic and Atmospheric Administration (NOAA, United States of America
- **Mr Sergio BARRIENTOS**, National Seismic Centre, University of Chile
- **Ms Maria Ana BAPTISTA**, Professor at the Instituto Superior de Engenharia de Lisboa and a researcher at Instituto Dom Luiz, University of Lisbon (Portugal)
- **Ms Silvia CHACON**, Costa Rica National Tsunami Warning System, National University of Costa Rica
- **Mr David COETZEE** (Retired) National Emergency Management Agency, New Zealand
- **Mr Yutaka HAYASHI**, Meteorological Research Institute, Japan Meteorological Agency
- **Ms Hélène HEBERT**, National Tsunami Warning Centre, Atomic Energy and Alternative Energies Commission, France
- **Ms Christa von HILLEBRANDT-ANDRADE**, International Tsunami Information Center Caribbean Office, United States of America
- **Mr Alexander RABINOVICH**, Tsunami Laboratory, P.P. Shirshov Institute of Oceanology, Russian Academy of Sciences, Russian Federation
- **Ms Harkunti Pertiwi RAHAYU**, Research Center for Disaster Mitigation, Institute of Technology Bandung, Indonesia

- **Dr Laura KONG,** Chairperson for Tsunami Ready Coalition (ad-hoc)

Secretariat

- **Mr Bernardo ALIAGA**, Head of Tsunami Resileince Section
- **Dr Denis CHANG SENG,** Programme Specialist, Technical Secretary (ICG-NEAMTWS, TT DMP, Support /coordination ODTP-SC)
- **Dr Srinivasa Kumar TUMMALA**, Programme Specialist, Technical Secretary (IOTWMS).
- **Dr Ocal Necmioglu,** Programme Specialist, Technical Secretary (ICGs CARIBE & PTWS)

Observer

- **Dr Derya Itr VENNIN**, Associate Project Officer, TSR