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TT Tsunami Watch Operations: Recommendations and Actions

TOWS-WG XVII Key Recommendations



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Risk Knowledge, Detection, Warning and Dissemination

Preparedness and Response

ICGs

- TSPs may need to provide services for TGVs that may impact several MS
- Multi-purpose sea level monitoring stations to support MHEWS
- Use Exercises and Communication tests for monitoring data availability and quality
- Sharing of info on deployment of new technologies to monitor sea level variations
- TSPs to trial and operationalise dissemination of maritime bulletins to respective NAVAREA operators

Secretariat

- Distribute report on Monitoring and warning for TGVs including the list of tsunamigenic volcanoes to Member States and Volcano Observatories
- Initiate consideration of whether TSPs may need to provide new services for TGVs
- Circular letter to all Member States on Closure of Fax services by TSPs unless advised otherwise
- Develop reporting mechanism on Ocean Decade projects and against ODTP-RDIP KPIs aligning with Global KPI Framework

ICGs

- ICG/PTWS TT-Tsunami Ready to share guidance on Tsunami Ready Equivalency for further consideration by TT-DMP
- Exercises outside of working hours (night)
- ICG/IOTWMS WGI & WG3 to develop and share guidelines for TR Critical Infrastructure

Secretariat

- Webinars for each ICG on Maritime Services and on TGVs by involving Volcano Observatories and VAACs
- Development of Tsunami Ready Toolkit with TICs' lead

- Closer collaboration between IOC/UNESCO and WMO – MHEWS, UN EW4ALL, CIFI
- Review the roles and responsibilities for Meteo-tsunamis – JCB
- Extends the tenure of TOWS-WG and its Task Teams

Agenda of the Joint Meeting with TTDMP and Agenda of TTTWO



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Agenda of the Joint Meeting with TTDMP

1. Welcome & Introductions
2. Session Organisation
3. Wave Exercises and Significant Tsunami Events in each ICG
4. Planning for Ocean Decade
5. Local Source SOPs
6. Update on PTWS NTWC Competency Framework and Development of Global Framework
7. IUGG update
8. Update UN Sec General “Early Warnings For All” Initiative
9. Public Warning Systems - Galileo Emergency Warning Satellite Service (EWSS)
10. Planning for WTAD 2024
11. Update on Planning for the next Global Tsunami Symposium in Indonesia in November 2024

Agenda of the Meeting with TTWO

1. Session Organisation
2. Discuss Outcomes of the joint Meeting with TT DMP
3. Tsunami Watch Operations status and plans in all ICGs
4. Updates to Area of Coverage and ESZ Maps of the
5. Update Products for Maritime Community
6. Optimal Seismic and Sea level Monitoring Networks
7. Discussion on SOPs for Tsunamis Generated by Volcanoes and Meteo- tsunamis
8. Support for Ocean Decade Tsunami Programme Research & Development Implementation Plan
9. Develop TT TWO Work Plan

Recommendations from the Joint Meeting for TOWS-WG consider

1. Tsunami Exercises and Significant Tsunami Events

Notes the increasing challenges in receipt success and cost concerning the use of fax in disseminating and receiving tsunami threat information from TSPs ,

Requests Secretariat advise all Member States via Circular Letter that TSP fax transmissions of tsunami threat information will cease from 6 months of CL date, unless Member States advise within three months that fax transmissions of tsunami threat information is essential for NTWC functions and there is no other back-up.

Recommendations from Joint Meeting for TOWS-WG consider

2. Local Source SOPs (Status and coordination of advice each ICG):

Notes with appreciation the **UNESCO-IOC Technical Report 183 published by the TT TWO Ad Hoc Team on Tsunamis Generated by Volcanoes (TGV)** led by Dr. Francois Schindele and the research paper submitted to the Journal of Pure and Applied Geophysics (PAGEOPH)

Requests the Secretariat:

- a. Provide the TGV Report, including the List of Tsunamigenic Volcanoes to Volcano Observatories
- b. Provide the TGV Report, including the List of Tsunamigenic Volcanoes to UNESCO/IOC Member States

Recommendations from the Joint Meeting for TOWS-WG consider

2. Local Source SOPs (Status and coordination of advice each ICG) (cont):

c. Organise online webinars for each ICG and involving relevant Volcano Observatories and VAACs to:

- Brief on the TGV report and its recommendations,
- Highlight the hazard and vulnerable Member States,
- Initiate the required partnerships between NTWCs and volcano observatories and VAACs,
- Initiate consideration whether TSPs may also need provide services where TGV hazard may impact several Member States

Recommendations from Joint Meeting for TOWS-WG consider

2. Local Source SOPs (Status and coordination of advice each ICG) (cont):

Requests the TT TWO to review existing SOPs and develop general guidelines on SOPs to warn for TGVs for NTWCs and TSPs

Notes the progress of the *Ad Hoc* Team on Meteotsunamis led by Mr. Mike Angove in consultation with representatives from WMO and work still required to complete the report

Requests the *Ad Hoc* Team on Meteotsunamis complete a draft of the report for offline review by the TOWS-WG to be utilised as background information for consideration of the recommendations by the next meeting of IOC/WMO JCB in third quarter 2024.

Recommendations from Joint Meeting for TOWS-WG consider



3. Update on PTWS NTWC Competency Framework and Development of Global Framework

Recommends the TT TWO contributes to the evaluation of the pilot training to be provided to Pacific Island Countries and Territories (PICTs) by ICG/PTWS and ITIC in 2025 to facilitate the development of a global framework for endorsement by TOWS-WG

Acknowledging the OTGA Regional Training Centre operated by INCOIS in India has already developed and delivered competency training for NTWC staff from Oman

Recommends ITIC and the OTGA Regional/Specialised Training Centres support the development and delivery of curated course content training programmes in support of the global framework for NTWC staff competencies,

Recommendations from Joint Meeting for TOWS-WG consider

4. Planning and Contributions to UN Ocean Decade

Notes with appreciation the continuing work of the Ocean Decade Tsunami Programme Science Committee (ODTP) led by Srinivasa Kumar Tummala

Recommends the Secretariat work closely with the Decade Coordination Unit (DCU), keep track of future Ocean Decade calls, and improve communication with DCU on tsunami community needs and requirements,

Recommendations from Joint Meeting for TOWS-WG consider

4. Planning and Contributions to UN Ocean Decade (cont)

Encourages ICGs, Secretariat, and Member States to consider submitting coordinated Ocean Decade actions in future calls that contribute to the goals of the Ocean Decade Tsunami Programme, including identification of and submission of existing projects that may align with the ODTP.

Recommends IOC collaborate more closely with WMO to connect tsunami activities with the MHEWS and EW4ALL initiatives. The WMO Coastal Inundation Initiative is an example of a multi-activity addressing coastal inundation, no matter the source of the inundation,

Requests the IOC/WMO Joint Collaborative Board (JCB) explicitly explore opportunities for IOC and WMO to further collaborate on MHEW framework, noting TOWS-WG Terms-of-Reference cover tsunamis and other sea level related hazards

Recommendations from Joint Meeting for TOWS-WG consider

4. Planning and Contributions to UN Ocean Decade (cont)

Requests the Secretariat to facilitate socialisation and advice to the ICGs on the Ocean Decade processes and opportunities, such as Calls for Action.

Notes that a draft Vision 2030 White Paper Challenge 6 on increasing community resilience to ocean hazards is now available for public review,

Encourages TOWS WG and TTs members to review the Ocean Decade Vision 2030 White Paper and provide comments by February 2024.

Requests the TT TWO and TT DMP to develop KPIs for the relevant sections of the ODTP Research & Development Implementation Plan (RDIP) to monitor progress

Requests the Secretariat develop a reporting mechanism to allow ICGs to report progress on related projects within the Ocean Decade and against the ODTP RDIP KPIs, aligning this with the proposed Global KPI Framework for the UNESCO-IOC Tsunami Programme

Recommendations from Joint Meeting for TOWS-WG consider

5. Public Warning Systems - Galileo Emergency Warning Satellite Service (EWSS)

Notes the progress made by the European Commission's DG DEFIS towards introducing in the Galileo infrastructure the "Emergency Warning Satellite Service" (EWSS) as a multi-hazard alert dissemination means by satellite offered to EU national civil protection authorities to complement existing terrestrial alert systems, as well as the completion of the demonstration campaign conducted in 2023/2024 with national civil protection authorities in France, Germany, Cyprus, and BE/LU, and the intended declaration of the initial service in 2025, for adoption by EU MS civil protection services, and eventual adoption by end users.

1. Sea Level and Seismic Data for Timely and Accurate Tsunami Warnings:

Noting the dependency of TSPs and NTWCs on seismic and sea level information for timely and accurate warnings to save lives

Noting the Goal of the ODTP to quantitatively enhance the timeliness and accuracy of tsunami warnings by expanding and increasing access to all existing sea level and seismic data and to utilise new technologies to fill data gaps

Noting the new requirements to monitor sea level at enhanced resolution to be able to detect and warn for tsunamis generated by non-seismic sources

Noting the benefits of multiple-purpose monitoring systems supporting MHEWS in terms of maximising the data available and sharing the costs to purchase and maintain

1. Sea Level and Seismic Data for Timely and Accurate Tsunami Warnings (cont):

Recommends the TT TWO:

- a) Continue to monitor the optimal sea level and seismic network design studies being undertaken in US, NZ, and India for the PTWS and support same studies to be undertaken by respective ICGs for IOTWMS, NEAM-TWS, CARIBE-EWS
- b) Identify core information and indicators required by each ICG to monitor status of observing networks and the quality of the data to meet existing and enhanced tsunami warning requirements as identified in the UNODTP Research & Development Implementation Plan (RDIP)
- c) Review the previously recommended data format for sea level data and update as required to ensure facilitates exchange of data at required resolutions and sampling rates, and to ensure data format contains metadata to enable TSPs and NTWCs to determine level of individual station suitability for tsunami detection and warnings.

Recommendations from TT TWO for TOWS-WG consider

1. Sea Level and Seismic Data for Timely and Accurate Tsunami Warnings(cont):

Recommends the ICGs:

- a) Once the optimal sea level and seismic networks design has been completed for the Area of Service (AoS), work with Member States to fill identified gaps, including the strategic and coordinated submission of projects to the UN Ocean Decade and potential funding sources for support.
- b) TSPs routinely monitor (at least every 6 months) the status of sea level and seismic observing networks and the quality of the data to meet existing and enhanced tsunami warning requirements in their AoS, including the provision of status summaries for the Secretariat to follow-up with relevant Member States to correct data issues (coverage gaps and data quality).
- c) Utilise exercises and communication tests as an opportunity to simultaneously monitor data availability and quality.

1. Sea Level and Seismic Data for Timely and Accurate Tsunami Warnings (cont):

Recommends the Member States:

- a) Routinely monitor (at least every 6 months) the status of national sea level and seismic observing networks and the quality of the data to meet existing and enhanced tsunami warning requirements, correcting any issues with outages, quality and real-time accessibility of data as soon as possible, desirably within 6-months.
- b) Utilise and promote the use of multi-purpose sea level monitoring stations in support of MHEWS to enhance data coverage and reduce costs
- c) Sample sea level data at one second intervals and transmit this in real-time, given the critical need to resolve and understand the near-field threat to high at-risk communities where a tsunami may arrive in 5-30 minutes.
- d) Share information and procedures on deployments of new technologies to monitor sea level variations used for tsunami warning purposes, noting the ongoing project of the CAM SMART cable off Portugal

Recommendations from TT TWO for TOWS-WG consider



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1. Sea Level and Seismic Data for Timely and Accurate Tsunami Warnings (cont):

Recommends the IOC Sea Level Monitoring Facility:

Increase the tabled sea level data at one second intervals (where available) and display sea level time series as a continuous line.

2. Products for Maritime Community:

Noting the requirement for vessels at sea to be aware while in transit of any potential tsunami hazard impacting their port of destination

Noting NAVAREAs are the maritime geographic areas in which various governments are responsible for navigation and weather warnings

Noting concerns raised by some International Hydrographic Organisation (IHO) NAVAREA operators responsible for advising vessels at sea of navigational hazards of difficulties they have in interpreting tsunami warnings to develop advice for mariners

Noting with appreciation the work of the TT TWO in developing specialised TSP bulletins for the maritime community in consultation with the IHO Sub-Committee on the World-Wide Navigational Warning Service (WWNWS-SC)

2. Products for Maritime Community (cont)

Requests TSPs:

- a) Trial dissemination of maritime bulletins to respective NAVAREA operators in their Area of Service (AoS) in second half of 2024 for full operational implementation by 1 January 2025.

Requests the Secretariat:

- a) Organise webinars for the NAVAREA Operators for each ICG to introduced the new service and products in first half of 2024
- b) Obtain and advise TSPs of the contact information for their respective NAVAREA Operators to disseminate the new maritime bulletins

Recommendations from TT TWO for TOWS-WG consider



3. Global Services Definition Document

Notes with appreciation the work of Chip McCreery in drafting an extensive update to the Global Services Definition Document

Requests the Secretariat distribute the latest draft to members of the TT TWO for review and feedback by the end of April 2024

4. Tsunami Threat Information and Warning Products

Requests the Secretariat distribute the basic tsunami warning product/template for use in radio developed in Caribbean by Dr. Elizabeth Vanacore to TT TWO members to review and provide feedback by end May 2024 to develop guidance to Member States

Requests the TT TWO develop a global CAP template for TSPs to facilitate exchange of bulletins between basin TSPs and their NTWCs, between TSPs of different basins, and for public TSP bulletins (e.g. for IOTWMS)

Recommends the ICG/NEAMTWS implement threat levels described in Global Services Definition Document to help harmonise global tsunami threat information products when practical

Noting the need for more accurate and precise tsunami forecast especially in complex tectonic context

Notes the ICG/NEAMTWS support to investigate and possibly adopt tsunami forecasting method by TSPs which represent an improvement over the method in use with the goal of reducing uncertainty and false alarms, particularly the forecasting methods which consider tsunami numerical modeling and uncertainty quantification

Recommendations from TT TWO for TOWS-WG consider

5. Area of Coverage and ESZ Maps of the ICGs

Noting the seismic zone in the Scotia Arc region is very active and have produced 33 earthquakes of magnitude 6.5 or greater since the year 2000, 13 of which were magnitude 7.0 or greater,

Noting that the August 12, 2021, magnitude 8.1 earthquake in the South Sandwich Islands of the Scotia Arc produced a tsunami recorded widely, including throughout the Pacific region,

Noting the Scotia Arc is not part of the PTWS Earthquake Source Zone,

Noting the ICG/PTWS decided to expand the PTWS Earthquake Source Zone to include an area from 63° to 52° south latitude and from 72° to 18° west longitude in order to routinely provide Member States of the ICG/PTWS with information about the frequent large earthquakes from this region, and any subsequent tsunami threat

Request the Secretariat to change the ICG/PTWS Earthquake Source Zone map in the Global Services Definition Document.



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THANK YOU