



International Union of Geodesy and Geophysics (IUGG)

2026 update

TOWS WG, Agenda 2.2, Non-UN Bodies, 4 March 2026

prepared by

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IUGG Joint Tsunami Commission

Associations: IAPSO (Oceans), IASPEI (Seismology), IAVCEI (Volcanology)



- Established 12th General Assembly of IUGG, July 1960
- Promote the exchange of scientific and technical information about tsunamis among nations concerned with the tsunami hazard
- ~70 members (Australia, Bulgaria, Canada, Chile, Costa Rica, Croatia, Estonia, France, Greece, India, Indonesia, Italy, Japan, NZ, Norway, Oman, Portugal, Turkiye, India, Russia, Singapore, UK, USA)
- Business Meeting 2023: Six Working Groups – enabled focused efforts
 - **Tsunami Terminology (review IOC TS 85, Tsunami Glossary) - Dr. William Power, NZ**
 - **Science-based Tsunami Warning (TOWS Ad Hoc TT, TS 183 - TGV) - Dr. Laura Kong, USA**
 - **Tsunami Magnitude – Dr. Vasily Titov, USA**
 - **GNSS Data for Tsunami Warning - Dr. Tony Song, USA**
 - **Meteotsunami (TOWS Ad Hoc TT) – Dr. Ivica Vilibić, Croatia**
 - **Tsunami Data –Dr. Viacheslav ‘Slava’ Gusiakov, Russia**



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Chair
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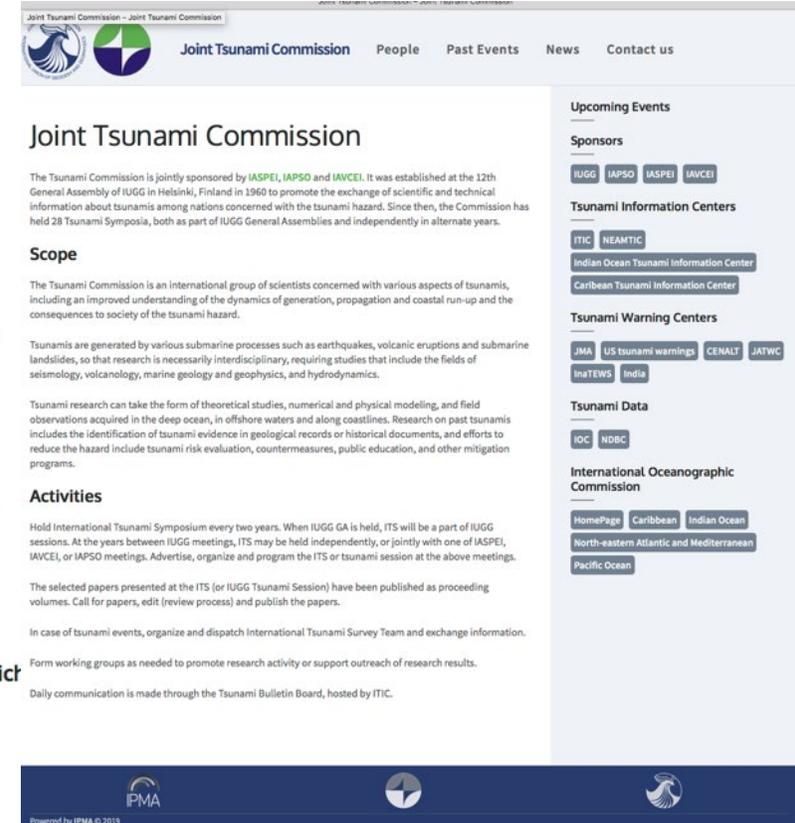
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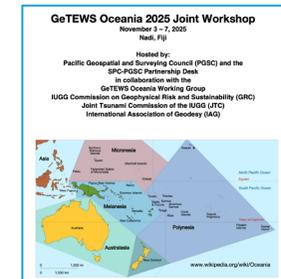


IUGG JTC – Meetings, Publication



- JTC jointly organized meetings:
 - The 2nd UNESCO-IOC Global Tsunami Symposium on “Two Decades After 2004 Indian Ocean Tsunami: Reflection and the Way Forward” held in Banda Aceh, Indonesia during 11-14 November 2024.

The Special International Scientific Workshop on “Tsunami Sciences after the 2004 Sumatra Earthquake” as a pre-event of the UNESCO-IOC Symposium.
 - Joint IOC JTC 60th Anniversary of the ICG/PTWS – Past and Future: Achievements and challenges, in China, April, 2025
 - Joint GeTEWS Oceania 2025 Workshop in Fiji, in Nov. 2025
 - 2025 ITS meeting in Hyderabad, India in Nov. 2025.
- JTC members actively participated in organization of numerous tsunami sessions in AGU, EGU, AOGS General Assemblies and other Intl conferences, such as The 3rd World Conference on Meteotsunamis (13-17 Oct 2025).
- Special Volume: Tonga Volcanic Eruption 2022: Topical collection in Pure and Applied Geophysics (PAGEOPH), 5 out of 18 papers published online in 2024.



2nd Global Tsunami Symposium, Nov 2024



Steering Committee

- Dr. Yuchiro Tanioka, IUGG-JTC Chair

Program Organizing Committee

- Dr. Srinivasa Kumar Tummala (IOC)
- Dr. Laura Kong (ITIC)

Preparing Teenagers For Tsunami Hazards
M.A. Baptista, C. Rosa, R. Jesus, S. Hawthorn, P.A. Santos

ABSTRACT
Preparing teenagers for tsunamis presents several challenges. They may struggle to fully comprehend the severity and impact of tsunamis, leading to difficulties in developing appropriate emergency response plans. Depending on the region of the world, teenagers have a different understanding of tsunami hazards, but providing teenagers demonstrates a reasonable ability to learn through games regardless of their geographical location. The interactive and engaging nature of gaming appeals to their generation. By incorporating education content into games, teenagers can acquire new knowledge and skills in a dynamic and entertaining way. Furthermore, games offer immediate feedback, rewards, and challenges that motivate teenagers to persist in learning and mastering various concepts.

BACKGROUND
As the scope of disaster risk reduction has the critical assumption, it is a lack of preparedness (knowing the risks) or denial. This is an amplified challenge for recognizing natural warning signs, highlighting how possessing key background knowledge about hazard characteristics empowers informed decision-making and ultimately improves outcomes in dangerous situations. Traditional narrative-based activities often struggle to effectively convey the risks and critical skills needed to navigate dangerous situations in tsunamis. Fortunately, digital serious games (DSGs) offer compelling alternatives. Unlike traditional games used for education and entertainment, DSGs immerse players in interactive and experiential scenarios.

GAME
LEVEL 1 - ESCAPE FROM HOME
In this level, the educational objective is to take an inventory of items, recognize and act on early warning signs. The player must identify each warning, with the option to purchase resource objectives. The player can also avoid or minimize the damage to the game character using a third-person camera, touch controls and a virtual joystick to control movement. In case of a tsunami, the earth shaking is simulated through audio effects and random camera movements using Particle.

SCORING
The scoring system is a crucial aspect for player progression and awareness in game-learning scenarios. In this level, the game uses a scoring system to track progress and reward players for completing each level. The scores are calculated based on the number of items collected, the time taken to complete the level, and the number of warnings identified. The scores are presented to the player at the end of each level and are used to unlock new levels and rewards.

SHOP AND SCORES
The shop is a vital component of the game, allowing players to purchase and upgrade their character and resources. The shop is divided into two sections: a character shop and a resource shop. The character shop allows players to purchase new clothing and accessories, while the resource shop allows players to purchase additional resources such as food, water, and tools. The scores are used to determine the player's rank in the shop and to unlock new items.

RESULTS
The results of the game are presented to the player at the end of each level and are used to track progress and reward players for completing each level. The results are presented in a clear and concise manner, showing the player's score, the number of items collected, and the time taken to complete the level. The results are also used to determine the player's rank in the shop and to unlock new items.

ACKNOWLEDGEMENTS
The authors would like to thank the following organizations and individuals for their support and contributions to this project: UNESCO-IOC, the Republic of Indonesia, and the Politécnico de Lisboa.

2nd UNESCO-IOC Global Tsunami Symposium

Two Decades After
2004 Indian Ocean Tsunami:
Reflection and the Way Forward

Summary Statement

Banda Aceh, Indonesia
11–14 November 2024

Sponsored by:
UNESCO-IOC and the Republic of Indonesia

Conference Speakers, Panelists, Rapporteurs

Ignacio Aguirre-Ayerbe, Dilanthi Amaratunga, Alessandro Amato, Suci Dewi Anugrah, Januar Arifin, Rick Bailey, Denis Chang-Seng, Ben Churchill, Nigel Clark, David Coetzee, Louise K Comfort, Rosalind Cook, Elena Daskalaki, Nora Gale, Harsh Gupta, Aditya Gusman, Richard Haigh, Christa von Hilebrandt-Andrade, Nikos Kalligeris, Osamu Kamigaichi, Dwikorita Karnawati, Laura Kong, Shunichi Koshimura, Sinishi Kuriyama, Stefano Lorito, Finn Løvholt, Sunanda Manneela, Charles McCreery, Gérard Metayer, Mohammad Mokhtari, Ocal Necmioglu, Yuji Nishimae, Triarko Nurlambang, Rina Suryani Oktari, Yuichi Ono, Irina Rafliana, Harkunti P Rahayu, Syed Aamir Riaz, Marco Toscano Rivalta, Fabricio Romano, Rully, Rustian, Francoise Schindele, Jan Sopaheluwakan, Harald Spahn, Syamsidik, Yuichiro Tanioka, Rahmat Triyono, Srinivasa Kumar Tummala, Vijay Kumar Ummidi, Singo Ushida, Dakui Wang, Stuart Weinstein, Weniza

Side Event Speakers, Panelists, Rapporteurs

Nicolás Arcos, Aditya Gusman, Mohammad

Heidarzadeh, Shunichi Koshimura, Lilik Kurniawan, Iyan Mulia, Roby Pratama, Alexander Rabinovich, Harkunti P Rahayu, Rinda Nita Ratnasari, Jefrizal Revanche, Vasily Titov, Sugeng Triutomo, Gusiakov Viacheslav

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Acknowledgements

The organisers would like to acknowledge the strong support and contributions of the Republic of Indonesia, UNESCO-IOC, various conference committees, chairs, rapporteurs, speakers and all participants for the successful conduct of the symposium. The organisers would also like to convey special thanks to the people

JTC IUGG Special Session - 9 Nov 2024, Banda Aceh



Tsunami Sciences after the 2004 Sumatra Earthquake

Speakers (remote *)

- Dr. Yuchiro Tanioka
- Dr. Mohammed Hierzdarzadeh *
- Dr. Viacheslav 'Slava' Gusiakov
- Dr. Aditya Guzman
- Dr. Shunichi Koshimura
- Dr. Alexander Rabinovich
- Dr. Vasily Titov *

THE IUGG
SPECIAL SESSION OF THE
INTERNATIONAL SCIENTIFIC WORKSHOP

TSUNAMI SCIENCES

AFTER THE 2004 SUMATRA EARTHQUAKE

KEYNOTE LECTURE
Prof. Gusiakov Viacheslav
"Mega-tsunamis in the World Ocean: Historical Overview and Implication for Tsunami Warning and Hazard Assessment"

INVITED LECTURE SERIES

DR. VASILY TITOV
"Advances in tsunami forecast around Pacific"

PROF. SHUNICHI KOSHIMURA
"Digital Twin for tsunami disaster prevention in Japan"

DR. ADITYA GUSMAN
"Tsunami studies in New Zealand following the 2004 Indian Ocean Tsunami"

MAIN TOPIC: ADVANCES IN TSUNAMI FORECAST

PROF. ALEXANDER RABINOVICH
"New findings of the 2004 tsunami: about 50 new records"

PROF. MOHAMMAD HEIDARZADEH
"Tsunami hazards in East Indonesia: new findings and future directions"

DR. IYAN MULIA
"Tsunami studies along the Sunda Trench including the 2018 Krakatau Tsunami"

DR. RINDA NITA RATNASARI
"Tsunami forecast method for large earthquakes and volcanic tsunamis along the Sunda Trench"

Saturday | November 9th, 2024 | 09:00 WIB
Venue: Syah Kuala University, Banda Aceh

2025 International Tsunami Symposium (ITS)



ITS – every 2 years – tsunami research, including disaster prevention

ITS 2021 – Sendai, Japan

ITS 2023 – Bali, Indonesia

ITS 2025 took place in Hyderabad, India

*At the JTC Business Meeting in July 2023, Dr Srinivasa Kumar Tummala (Director, Indian National Centre for Ocean Information Service, INCOIS), made a proposal to host ITS 2025 in Hyderabad, India. **INCOIS provided update at 2025 ODTP-SC (Jan 2025)***



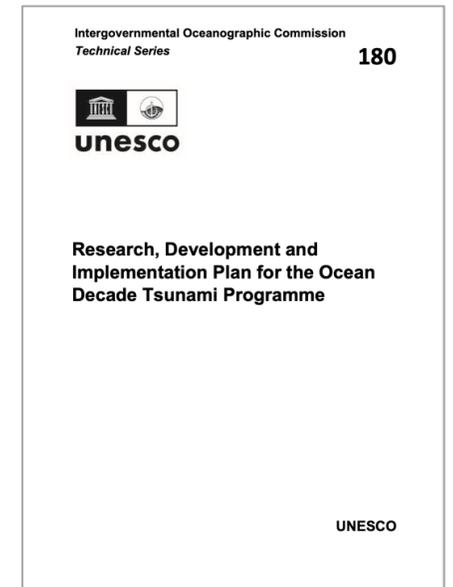
IOC support - Scientific Committee of ODTP



Meeting at UNESCO Headquarters in Paris. Altogether, 5 meetings.
Last: 16-17 January 2025

IUGG JTC members part of UN Ocean Decade Tsunami Programme
Scientific Committee (SC):

- Dr. Alexander Rabinovich
- Christa von Hillebrandt-Andrade
- Dr. Helene Hebert
- Dr. Maria Ana Baptista
- Dr. Silvia Chacon (SC Chair a.i.)
- Dr. Laura Kong (ad hoc as Tsunami Ready Coalition Chair)



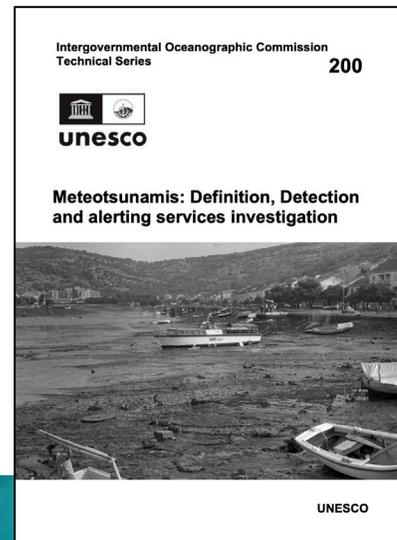
IOC support: Meteotsunamis



Participation in TOWS ad hoc TT :
Ad hoc Team on Meteotsunamis: definition,
detection and alerting services of the IOC
of UNESCO (TS 200, 2025)

JTC members

- Ivica Vilibić, JTC WG Chair for Meteotsunami
- Mohammad Heidarzadeh
- Emile Okal
- Chari Pattiaratchi
- Alexander Rabinovich
- Jadranka Šepić
- Vasily Titov



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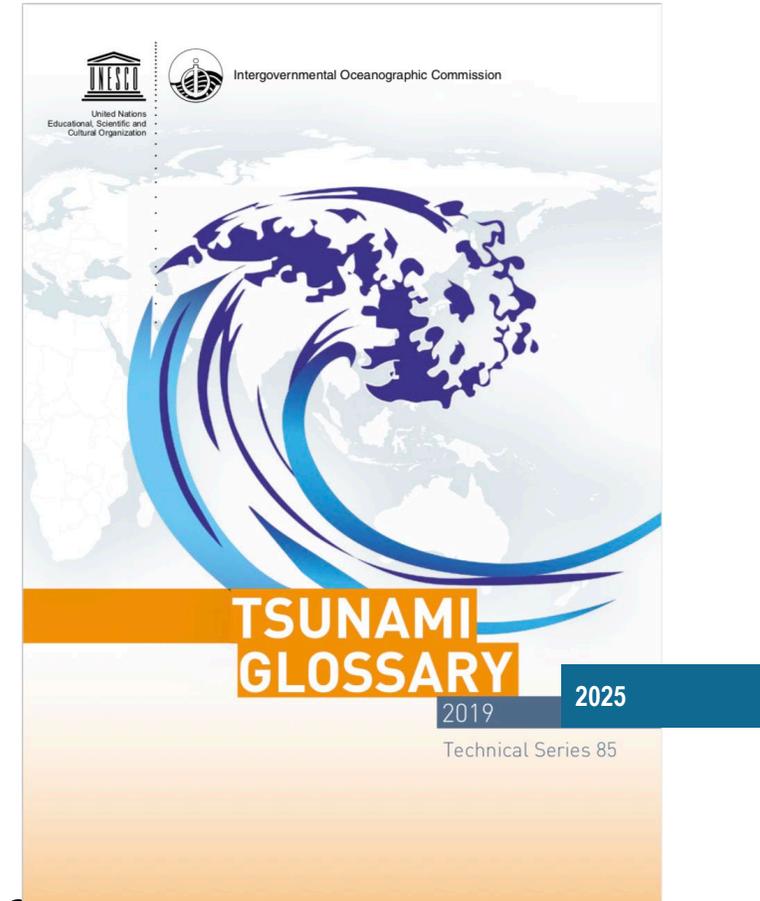
ANNEXES

- [GLOSSARY OF TERMS](#)
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IOC support: Tsunami Glossary 2025



- JTC Working Group on Terminology
William Power, Chair
From 2021: Kelly Stroker, Alexander Rabinovich, Fumihiko Imamura, Lori Dengler, Diana Greenslade, Laura Kong
- Beginning to review toward next update
- 2024 TOWS WG approved edits/updates (except for meteotsunami)
Lamb waves, UNESCO/IOC Tsunami Ready Recognition Programme, Tsunamis generated by volcanoes.
- **2025 Tsunami Glossary currently being published**
(IOC TS 85, rev 2025) – English, French, Spanish, Arabic, Chinese



IOC support - other activities



- IOC Roger Revelle lecture, 2024 – Emile Okal
- WMO Task Team on Long Waves under the Expert Team on Waves, Coastal Hazards, and Marine Emergency Response (ET-WCHMER) – Vasily Titov
- WMO-IOC JCB – Srinivasa Kumar, co-chair 2023-24
- UNESCO International Geoscience Programme (IGCP) Scientific Board (evaluate geohazards proposals) – Christa von Hillebrandt-Andrade
- ITU-WMO-UNESCO IOC Joint Task Force for SMART Subsea cables – Science and Society co-chair – Laura Kong
- Capacity Development
 - IOC Group of Experts for Capacity Development – Laura Kong
 - IOC OceanTeacher Global Academy (OTGA) Specialized Training Center for Tsunamis (TWC Min Competency course) - JTC WG on Science-based Tsunami Warning – ITIC and IOC TSR
 - Ocean Decade Capacity Development Facility – Christa von Hillebrandt-Andrade, IOCARIBE rep
- UN Ocean Decade committees, task force, WG – many involved