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IOWave25

15.4 Exercise IOWave25 and Scenarios

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WG-2 meeting (online)
25 August 2025

Previous Indian Ocean-Wide Tsunami Exercises (IOWave)

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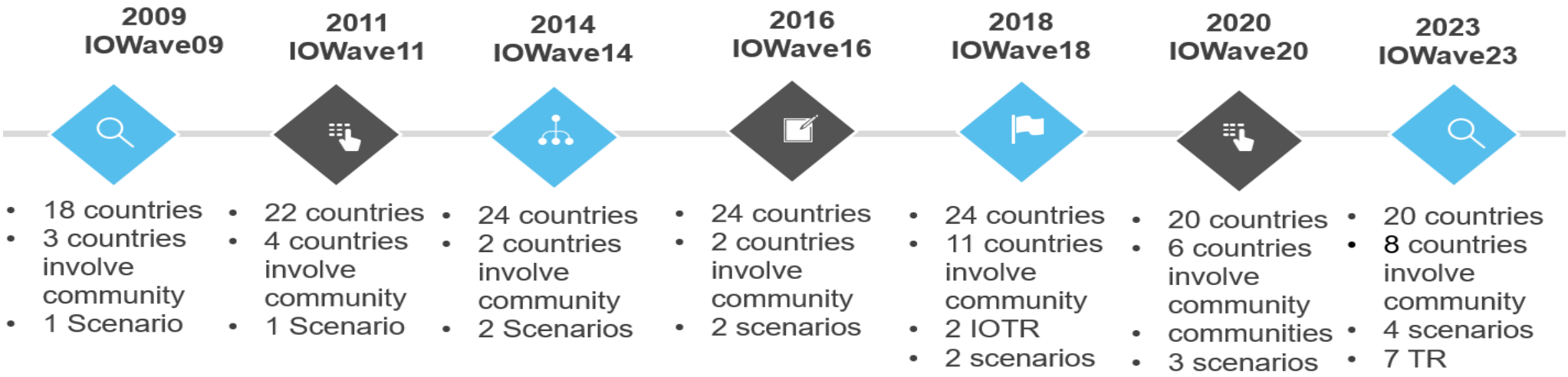
Conducted by ICG/IOTWMS to test tsunami notification and response systems:

1. **IOWave09** (Oct 2009)
2. **IOWave11** (Oct 2011)
3. **IOWave14** (Sep 2014)
4. **IOWave16** (Sep 2016): Over 60,000 people participated in evacuation drills
5. **IOWave18** (Sep 2018): Participation exceeded 119,000
6. **IOWave20** (Oct 2020): Testing communication protocols during the pandemic
7. **IOWave23** (Oct 2023): ~45,000 people participated, including all genders, children, elderly, and persons with disabilities



IOWave25 Task Team

- **Dr Ajay Kumar B**, INCOIS, India - Chair
- **Ms Septa Anggraini**, Indonesia – Vice Chair
- Ms Kate Parkey (tbc), Australia - Member
- Dr Nuraini Rahma Hanifa, Indonesia - Member
- Mr Zaidi Zainal Abidin, Malaysia - Member
- Mr Abdullah Al Busafi, Oman - Member
- Ms Doreen Ikula, Seychelles - Member
- Mr Chathura Liyanaarachchige, Sri Lanka - Member
- Mr Badr Alameri, UAE - Member
- Mrs Shamma Alneyadi, UAE - Member
- Mr Hadif Alshehhi, UAE - Member
- Mr Ali Almehrzi, UAE - Member
- Mr Abduallah Alymmahi, UAE - Member
- Mr Hilal Alkaabi, UAE - Member
- Dr Robert Greenwood (tbc) Australia, TSP Australia Representative
- Mr Yedi Dermadi (tbc), Indonesia, TSP Indonesia Representative
- Dr Weniza, Indonesia - WG1 Chair
- Mr Padmanabham Jijjavarapu, India - WG2 Chair / TSP India Representative
- Ms Suci Dewi Anugrah, Indonesia - WG3 Chair
- Mr Ardito Kodijat - IOTIC

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- Task Team established during **ICG/IOTWMS-XIV** (Nov 2024, Banten, Indonesia)
- Scheduled for **September – November 2025**
- Member States encouraged to ensure **broad participation**, including at community level

IOWave25 Exercise Purpose

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Purpose:

- To evaluate and improve **the effectiveness of the IOTWMS**, through its operational Tsunami Service Providers (TSPs), National Tsunami Warning Centres (NTWCs), National Disaster Management Organisations (NDMOs) and Local Disaster Management Organisations (LDMOs), and other relevant authorities in responding to a potentially destructive tsunami.

- To test **operational lines of communications**, **review tsunami warning** and **emergency response Standard Operating Procedures (SOPs) and promote emergency and community preparedness** in India Ocean countries.

IOWave25 Objectives

There are nine (9) objectives of Exercise IOWave25. Each objective is designed to validate a part of the end-to-end tsunami warning and mitigation system.

Objectives 1 and 2 survey questions relate to the at-risk coastal communities.

- ***Objective 1***: Validate procedures are in place to ensure tsunami warnings get to all in the community, including those with disabilities, all genders, elderly, and youth.
- ***Objective 2***: Validate the level of community awareness, preparedness, and response.

Objective 3 and 4 survey questions relate to standard operating procedures at all levels in the national tsunami warning chain.

- ***Objective 3***: Validate the Standard Operating Procedures associated with tsunami warning chains within countries for generating and disseminating tsunami warnings to their relevant emergency response agencies, other authorities, media, and the public.
- ***Objective 4***: Validate the Standard Operating Procedures associated with tsunami warning chains within countries for the issuing of public safety messages, ordering evacuations and where possible issuing all-clear messages.

Objectives 5 to 9 survey questions relate to the National Tsunami Warning Center and NAVAREA stakeholders.

- ***Objective 5***: Validate dissemination by TSPs of Tsunami Bulletin Notification Messages to NTWCs via Tsunami Warning Focal Points (TWFPs) of Indian Ocean countries and the reception by NTWCs of the TSP messages. Validate the access by NTWCs to the tsunami bulletins and other products on the TSP websites, and the use of that information to produce national warnings.
- ***Objective 6***: Validate dissemination by TSPs of Tsunami Bulletin Notification messages for NAVAREA stakeholders to ensure navigational safety and security.
- ***Objective 7***: Validate access by NTWCs to the tsunami bulletins and other products on the TSP websites, and the use of that information to produce national warnings. Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.
- ***Objective 8***: Validate the reporting by NTWCs to the TSPs of their National Tsunami Warning Status.
- ***Objective 9***: Validate receipt and understanding by NTWCs of new TSP service for tsunamis generated by non-seismic and complex sources.

IOWave25 Scenarios

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Scenario	1. Sunda Trench	2. Makran Trench	3. Fani Maore Volcano	4. Sumatra Trench
Date	25 September 2025 (Thursday)	15 October 2025 (Wednesday)	25 October 2025 (Saturday)	05 November 2025 (Wednesday)
Time	01:00 UTC	06:00 UTC	15:00 UTC (eruption at 14:00 UTC)	03:00 UTC
Source	Earthquake	Earthquake	Volcano	Earthquake
Magnitude	~M9.0	~M9.0	n/a	~M9.2
Depth	10 km	10 km	n/a	10 km
Latitude	6.94S	24.80N	12.92S	3.30N
Longitude	104.70E	62.20E	45.72E	95.96E
Location	Sunda Strait, Indonesia	Off Coast of Pakistan	Mozambique Channel	Northern Sumatra, Indonesia

Scenario 1
Sunda Trench, M9.0, 25 September 2025, 01:00 UTC.

Country	T2 (UTC)	MAX BEACH (m)
Australia	01:10	23.9
Bangladesh	08:12	1.6
Comoros	10:00	0.7
Djibouti	11:40	1.4
France	06:46	9.9
India	03:00	3.7
Indonesia	01:00	31.1
Iran	10:58	0.9
Kenya	10:36	1.5
Madagascar	08:44	5.4
Malaysia	08:04	0.6
Maldives	04:50	2.7
Mauritius	06:44	4.6
Mozambique	10:24	2.5
Myanmar	04:56	2.0
Oman	08:46	2.2
Pakistan	11:04	0.9
Seychelles	07:44	3.5
Singapore	-	-
Somalia	08:46	1.5
South Africa	11:24	7.5
Sri Lanka	04:00	2.3
Tanzania	10:26	1.4
Thailand	04:50	0.9
Timor-Leste	04:31	0.7
United Arab Emirates	14:48	0.8
Yemen	08:44	2.7

Scenario 1 starting at 01:00 UTC on Thursday 25 September 2025: Magnitude 9.0 earthquake in Sunda Strait, Indonesia. The simulated tsunami will take approximately 0 hours to travel from its source to Indonesia; 2.5 hours to travel to Australia; 3.0 hours to travel to Timor-Leste; and 4.0 hours to travel to Sri Lanka.

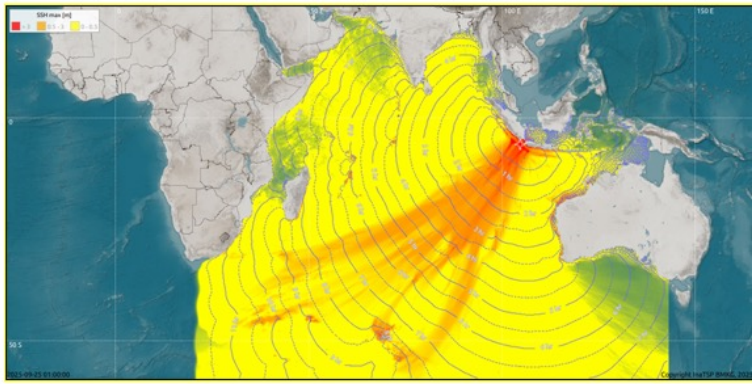

Figure 3. Maximum Wave Amplitude Map example for Scenario 1, Sunda Trench, for a magnitude 9.0.

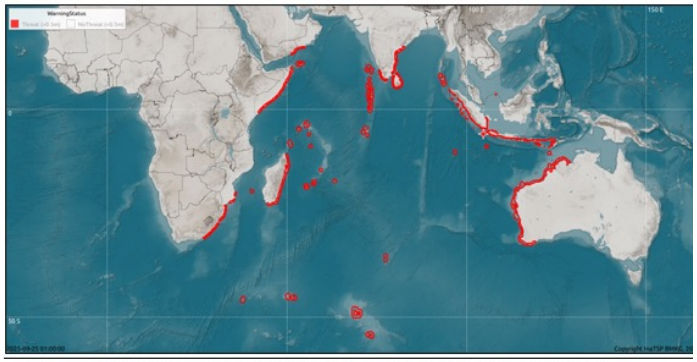

Figure 2. Threat Map example for Scenario 1, Sunda Trench, for a magnitude 9.0 earthquake.

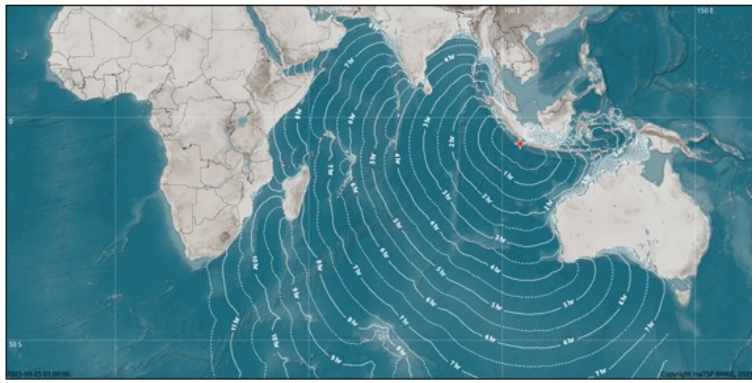

Figure 4. First detectable wave Tsunami Travel Time contour map example for Scenario 1, Sunda Trench.

Scenario 2
Makran Trench, M9.0, 15 October 2025 06:00 UTC

Country	T2 (UTC)	MAX BEACH (m)
Australia	19:40	1.1
Bangladesh	-	-
Comoros	12:17	1.0
Djibouti	11:12	2.0
France	13:30	1.4
India	07:46	2.9
Indonesia	13:35	0.7
Iran	06:00	9.3
Kenya	12:05	1.5
Madagascar	12:08	1.3
Malaysia	-	-
Maldives	09:19	2.6
Mauritius	11:44	1.4
Mozambique	12:32	1.1
Myanmar	-	-
Oman	06:12	13.3
Pakistan	06:00	18.5
Seychelles	10:33	1.6
Singapore	-	-
Somalia	09:12	1.9
South Africa	-	-
Sri Lanka	10:41	1.0
Tanzania	12:35	0.9
Thailand	-	-
Timor-Leste	-	-
United Arab Emirates	06:28	3.6
Yemen	08:19	1.9

Scenario 2 starting at 06:00 UTC on Wednesday 15 October 2025: Magnitude 9.0 earthquake in the Makran trench off the coast of Pakistan. The simulated tsunami will take approximately 0 hours to travel from its source to Pakistan and Iran; 0.5 hours to travel to Oman; 1.0 hours travel to United Arab Emirates; and 2 hours to travel to India

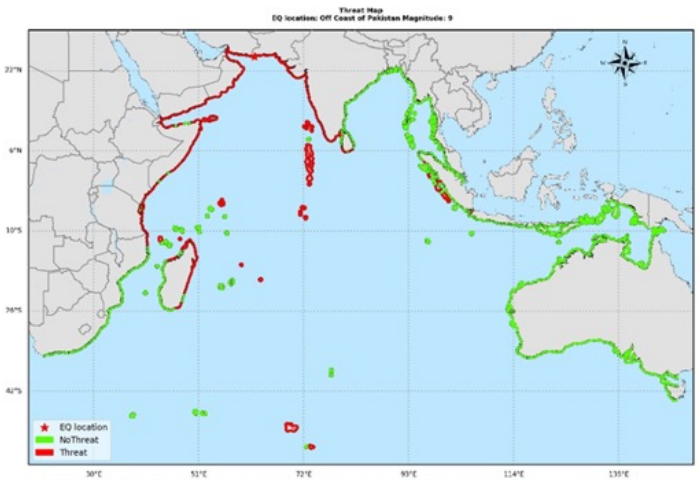

Figure 5. Threat Map example for Scenario 2, Makran Trench, for a magnitude 9.0 earthquake

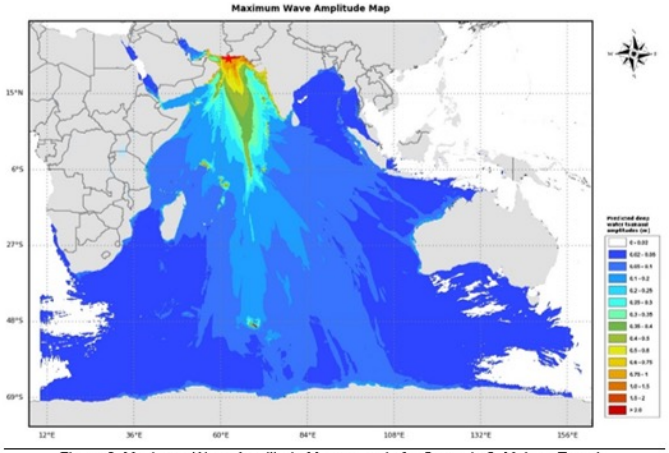

Figure 6. Maximum Wave Amplitude Map example for Scenario 2, Makran Trench, for a magnitude 9.0 earthquake.

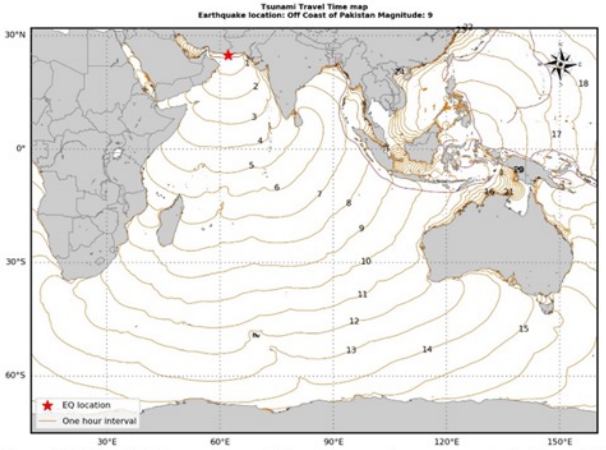

Figure 7. First detectable wave Tsunami Travel Time contour map example for Scenario 2, Makran Trench.

Scenario 3
Fani Maore Volcano, 25 October 2025, 15:00 UTC

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Country	T (UTC)
Australia	-
Bangladesh	-
Comoros	14:15
Djibouti	-
France	14:05
India	19:26
Indonesia	-
Iran	-
Kenya	15:56
Madagascar	14:16
Malaysia	-
Maldives	18:57
Mauritius	15:49
Mozambique	14:51
Myanmar	-
Oman	18:48
Pakistan	-
Seychelles	14:38
Singapore	-
Somalia	16:00
South Africa	17:46
Sri Lanka	-
Tanzania	15:13
Thailand	-
Timor-Leste	-
United Arab Emirates	-
Yemen	17:55

Scenario 3 starting at 15:00 UTC (eruption at 14:00 UTC) on Saturday 25 October 2025: Tsunami generated by volcanic eruption at Fani Maore in the Mozambique Channel between Madagascar and the eastern coast of Africa. The simulated tsunami will take approximately 0 hours to travel to Mayotte(France), Comoros, and Madagascar; 0.5 hours to travel to Seychelles; 1.0 hours to travel to Mozambique & Tanzania; and 2.0 hours to travel to Mauritius, Kenya, and Somalia.

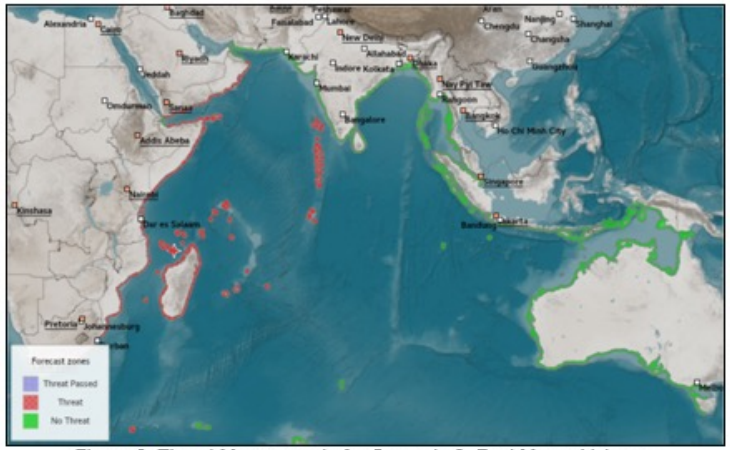

Figure 8. Threat Map example for Scenario 3, Fani Maore Volcano.

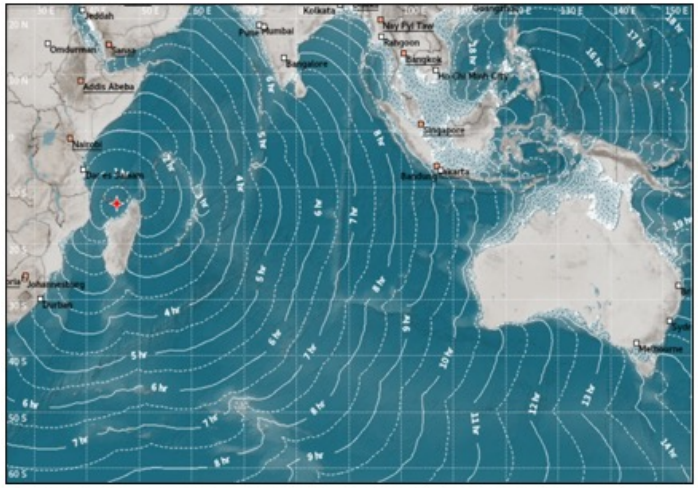
Figure 9. First detectable wave Tsunami Travel Time contour map example for Scenario 3, Fani Maore Volcano.

Scenario 4
Sumatra Trench, M9.2, 05 November 2025, 03:00 UTC

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Country	T2 (UTC)	MAX BEACH (m)
Australia	04:06	7.7
Bangladesh	05:56	3.7
Comoros	11:16	2.6
Djibouti	12:34	2.7
France	09:00	7.2
India	03:02	29.9
Indonesia	03:00	43.3
Iran	10:42	2.0
Kenya	11:08	4.6
Madagascar	10:24	8.8
Malaysia	05:58	4.0
Maldives	06:02	17.1
Mauritius	08:40	10.7
Mozambique	11:42	3.2
Myanmar	04:14	6.1
Oman	09:32	3.9
Pakistan	10:06	2.5
Seychelles	09:06	5.4
Singapore	-	-
Somalia	10:00	6.8
South Africa	13:32	6.8
Sri Lanka	04:36	15.6
Tanzania	11:28	2.8
Thailand	04:11	11.9
Timor-Leste	07:50	0.7
United Arab Emirates	11:36	1.2
Yemen	09:40	6.1

Scenario 4 starting at 03:00 UTC on Wednesday 05 November 2025: Magnitude 9.2 earthquake in Northern Sumatra, Indonesia. The simulated tsunami will take approximately 0 hours to travel from its source to Indonesia; 0.5 hours to travel to India; 1.0 hours to travel to Thailand & Myanmar, and 2.0 hours to travel to Sri Lanka.

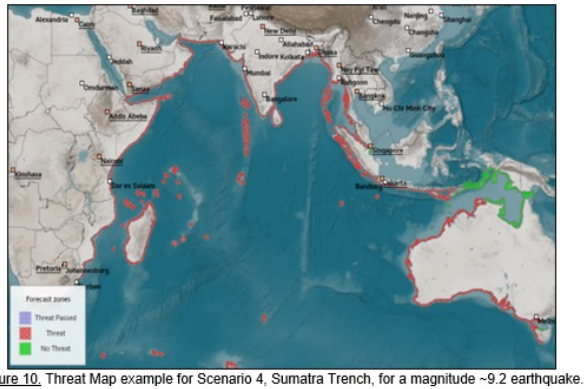


Figure 10. Threat Map example for Scenario 4, Sumatra Trench, for a magnitude ~9.2 earthquake.

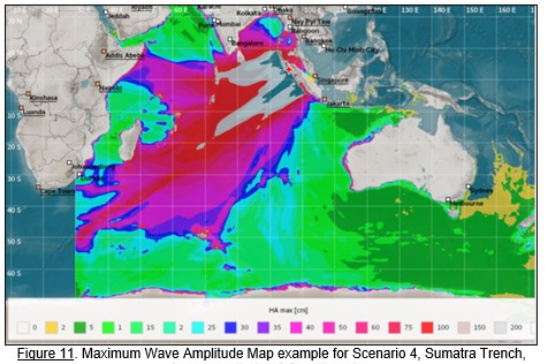


Figure 11. Maximum Wave Amplitude Map example for Scenario 4, Sumatra Trench, for a magnitude ~9.2 earthquake.

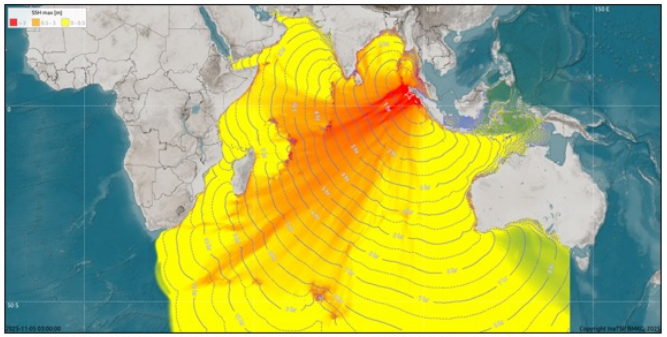


Figure 12. First detectable wave Tsunami Travel Time contour map example for Scenario 4, Sumatra Trench.

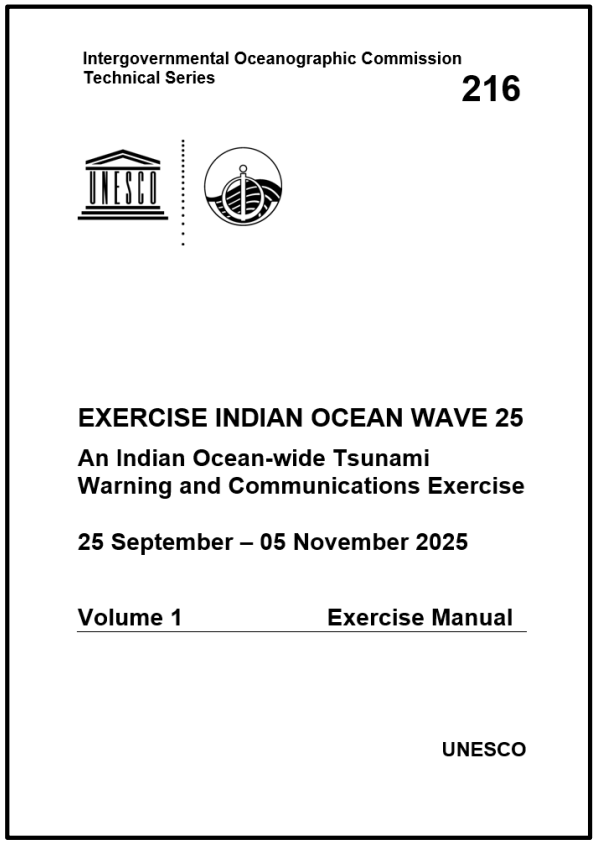
Participation Level

- Member States are invited **to participate in at least one scenario** or all **scenarios** (if country fall under threat);
- Member States are encouraged **to conduct community evacuations**;
- All Member States, particularly those piloting the Programme, are encouraged **to use the UNESCO-IOC Tsunami Ready guidelines** and **indicators to guide their community preparation for IOWave25 exercise**.

IOWave25 Check List & Timelines

No	Activity	Timeline
1	Announcement by IOC Circular Letter 3041	May 2025
2	Nominate a National Contact for IOWave25	June 2025
3	Set up IOWave25 Exercise National Coordination Committee involving NTWC, LDMOs, NDMOs, and all other important stakeholders including private industry participants	Ongoing
4	Assign agency roles including exercise controller, key participants, and observers	Ongoing
5	Decide on level of participation and identify communities for evacuation (where applicable)	Ongoing
6	Secure funding and support for community activities	Ongoing
7	Address indicators of UNESCO-IOC Tsunami Ready Recognition Programme or similar national initiative (where appropriate)	Ongoing
8	Issue of IOWave25 Exercise Manual by the Secretariat	June 2025
9	Develop a National IOWave25 Exercise Manual to plan/guide activities, including those at community level	June–July 2025
10	UNESCO-IOC Standard Operating Procedure (SOP) Training Workshops (online)	July–August 2025
11	Organise and hold pre-exercise national workshop(s) and meeting(s) with key stakeholders including media	August–September 2025
12	Ensure Standard Operating Procedures are in place and up to date	August–September 2025
13	Share IOWave25 Exercise in-country participation plans with the ICG/IOTWMS Secretariat	September 2025
14	Prepare a media press release	One week before the exercise
15	Participate in IOWave25 Exercise	25 September 15 October 25 October 05 November
16	Hold post-exercise hot and cold debriefs	After the Exercise
17	Complete the IOWave25 online post-exercise evaluation	After the Exercise
18	Revise and improve SOPs in accordance with lessons learnt during the Exercise	After the Exercise
19	IOC-UNESCO Post-IOWave25 Exercise Lessons Learnt Workshop (online)	December 2025

IOWave25 Manual & Supplements



- The IOWave25 **Exercise Manual** is complete.
- The **supplements** are under preparation.
- The manual will provide an overview including:

  Purpose, Objective, Scope, Exercise Success Criteria, Type of Exercise, Scenario, Date, Checklist Activities Member, Exercise Evaluation (Exercise Survey, Exercise Observer), Checklist of Activities for Member States
- The supplements will contain all TSP bulletins and products.
- The Task Team anticipates **completion** and **circulation by Secretariat in August 2025.**
- All information and documents will **be made available on the exercise website**:

  https://oceanexpert.org/event/4786

Pre-IOWave25 Workshops

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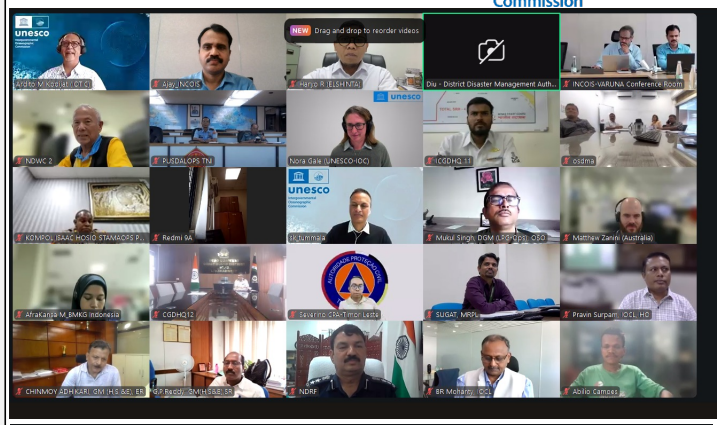
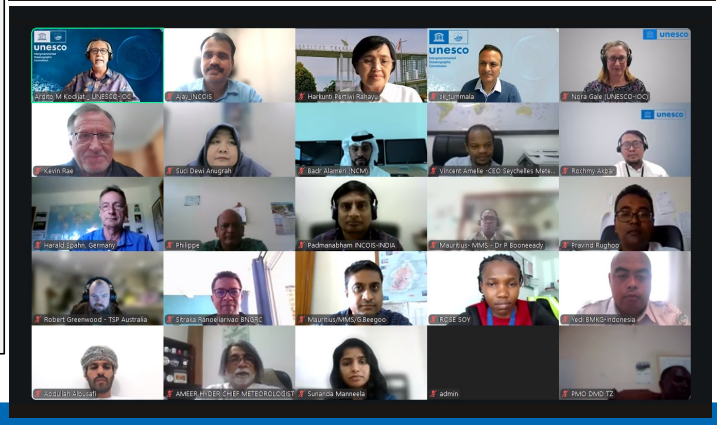
- IOTWMS secretariat & IOTIC incoordination with TT-IOWave25 conducted two pre-IOWave25 hybrid SOP workshops for Easter and Western Indian Ocean member states
- For Eastern Indian Ocean Member States, conducted during 4-6 August 2025 for 11 member states i.e. Australia, Bangladesh, India, Indonesia, Malaysia, Maldives, Myanmar, Singapore, Sri Lanka, Thailand, and Timor Leste.
- For Western Indian Ocean Member States, conducted during 11-13 August 2025 for 14 member states i.e. Comoros, France Indian Ocean Territories, Iran, Kenya, Madagascar, Mauritius, Mozambique, Oman, Pakistan, Seychelles, South Africa, Tanzania, United Arab Emirates and Yemen.
- Overall, the pre-IOWave25 workshops were grate success, about 400 participated in the hybrid workshops.





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Pre-IOWave25 Workshops on Standard Operating Procedures for NTWCs and DMOs
Hybrid – August 2025

IOWave25 Participation Planning

- Basen on the feedback received from member states during pre-IOWave workshops, at least 18 Member States of the IOTWMS have indicated plans to participate in Exercise IOWave25, i.e. Australia, Bangladesh, India, Indonesia, Madagascar, Maldives, Mauritius, Mozambique, Oman, Pakistan, Seychelles, Singapore, South Africa, Sri Lanka, Tanzania, Thailand, Timor Leste and UAE.
- **Scenario 1: Sunda Trench - 25 September 2025**
  - Participating Countries (4): Australia, Indonesia, Thailand and Timor Leste.
  - Evacuation plans: Indonesia.
- **Scenario 2: Makran Trench - 15 October 2025**
  - Participating Countries (7): India, Madagascar, Mauritius, Mozambique, Oman, Pakistan and UAE.
  - Evacuation plans: India, Mauritius, Oman and UAE.
- **Scenario 3: Fane Maore Volcano - 25 October 2025**
  - Participating Countries (3): Madagascar, Seychelles and South Africa.
  - Evacuation plans: Seychelles.
- **Scenario 4: Sumatra Trench - 5 November 2025 (World Tsunami Awareness Day)**
  - Participating Countries (13): Australia, Bangladesh, India, Indonesia, Madagascar, Maldives, Mozambique, Seychelles, Singapore, South Africa, Sri Lanka, Tanzania and Timor Leste
  - Evacuation plans: India, Indonesia, Madagascar, Mozambique, Seychelles, Sri Lanka, Timor Leste

THANK YOU

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