Tsunami Detection, Warning, and Dissemination

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Detection and Warning Capabilities

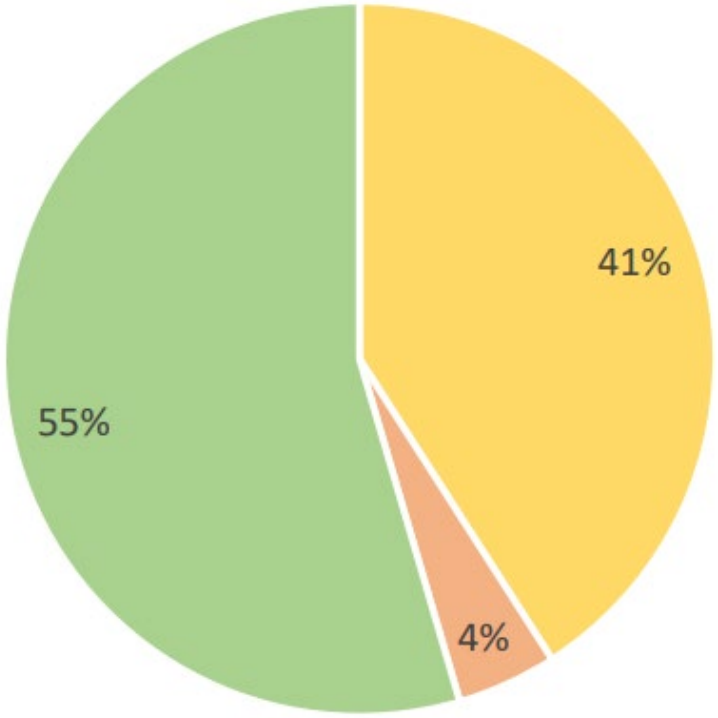
All countries (100%) have national capabilities to assess/receive potential tsunami threats and advise/warn coastal communities.

Data use for Coastal Forecast Zones (CFZ):

- ❑41% use only Tsunami Service Providers (TSP) data.
- ❑55% use both TSP data and their own threat assessment data.
- ❑Remaining use their own threat Assessment

24x7 Operational Capability:

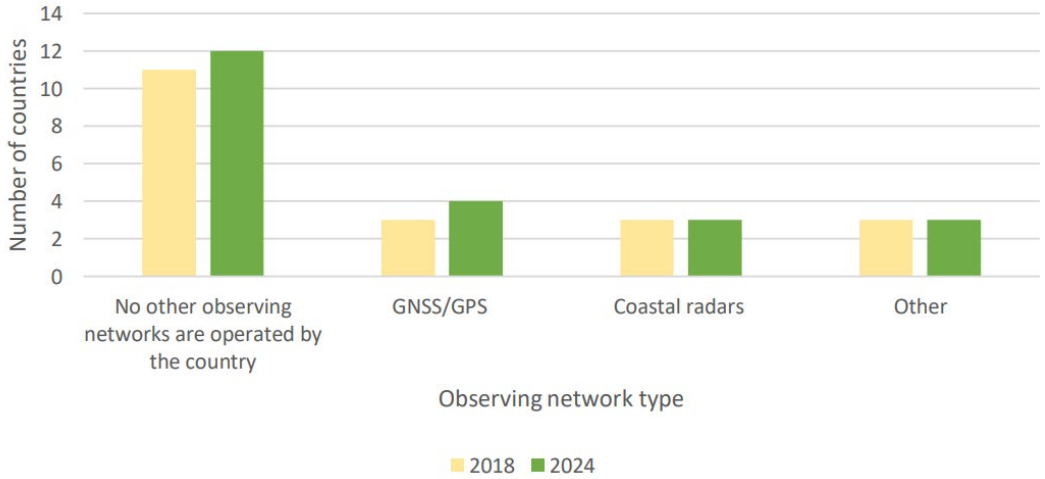
- ❑91% of countries have organizations operating 24x7 to manage tsunami threats.



*Comoros and Iran reported operating weekdays and daytime only due to a lack of resources

Observational Network Access - 2024

Based on the survey, there has been a notable increase of observing stations (seismic & Sea level) and GNSS/GPS network from member states.



Seismic and Sea Level Networks

Access:

- 91% have access to national or international networks. (20 MS)
- 41% share all seismic data in real-time. (09 MS)
- 46% share some seismic data in real-time. (10 MS)

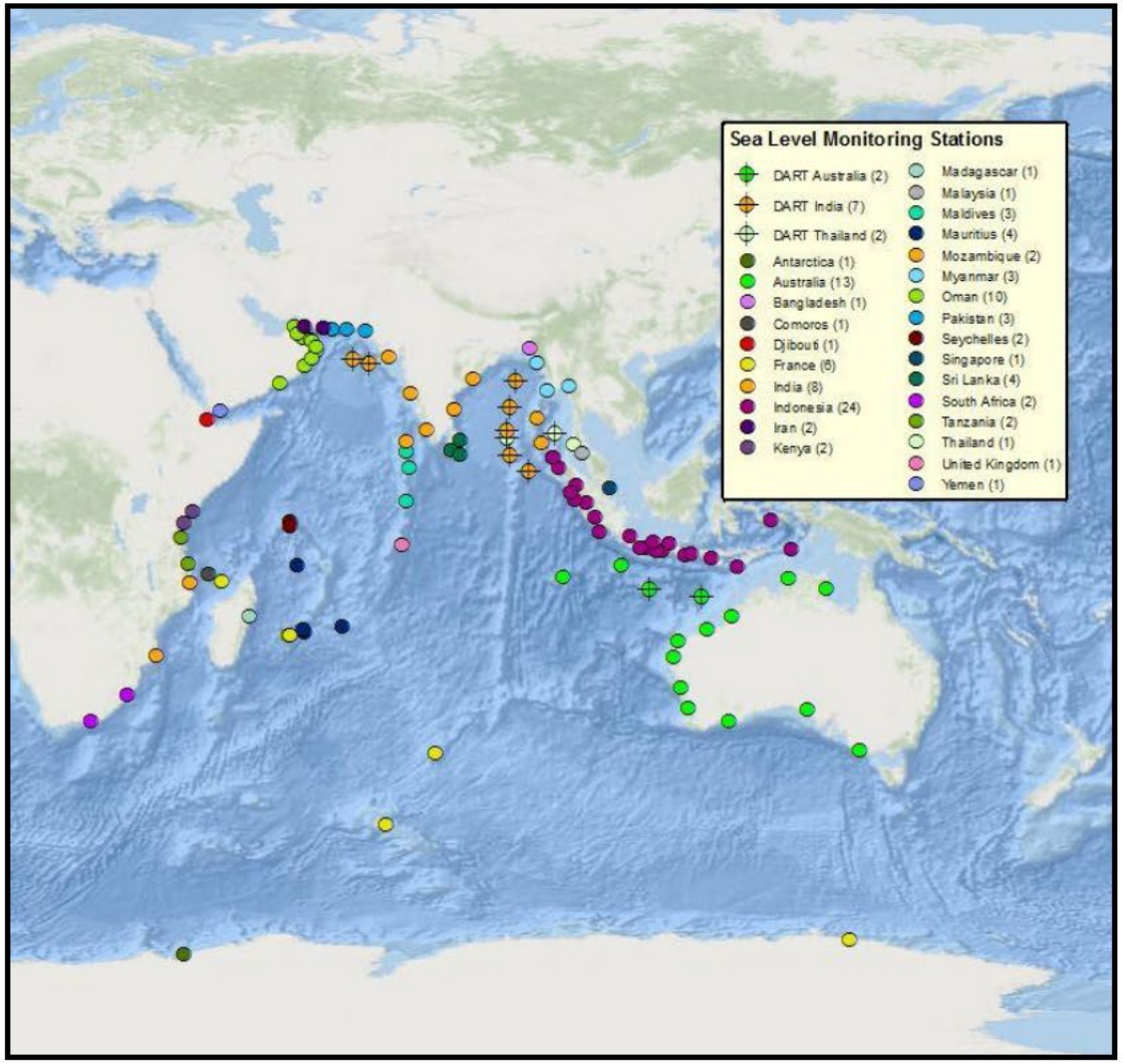
Sea Level Networks:

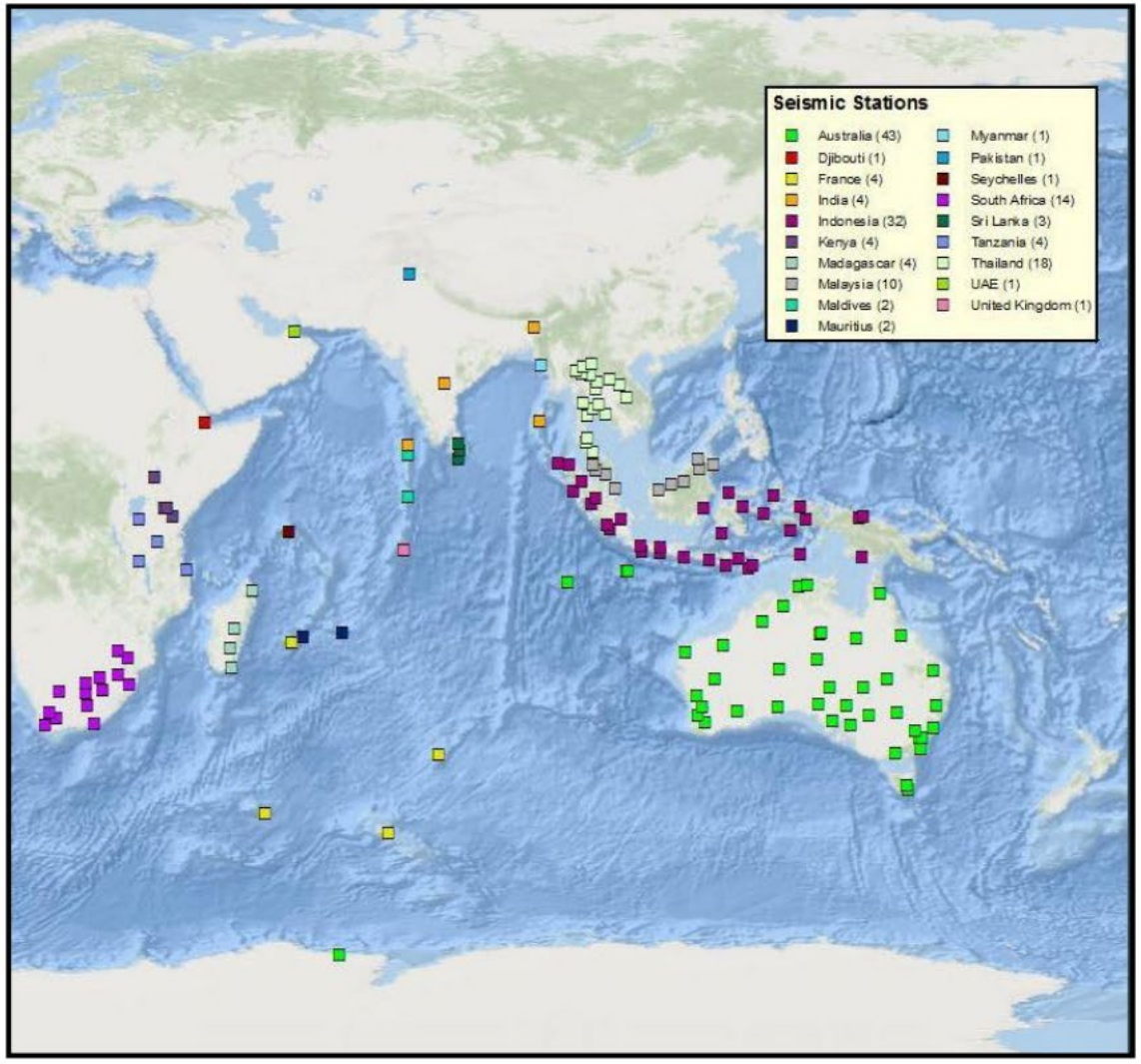
- 68% have access;
- 36% share all data in real-time.(08 MS)
- 18% share some sea level data in real time(04 MS)

GNSS & Other Observations

- 18% have access to GNSS/GPS stations (04 MS)
- 14% have access to coastal Radars

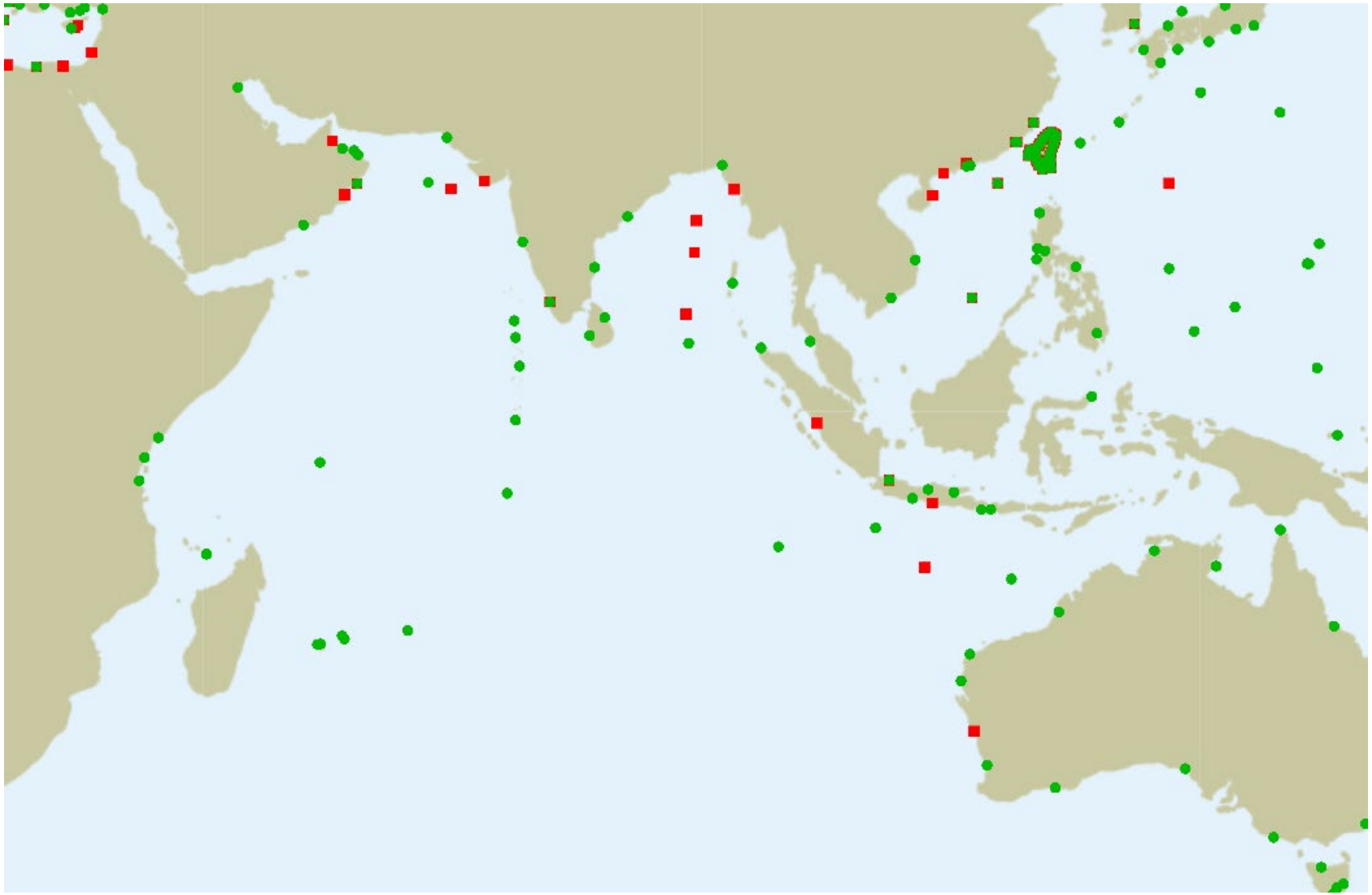
Monitoring Networks – Seismic & Sea-level -2017





The sea level stations (left) and broadband seismometers (right) in operation as of December 2017.
Source: ICG/IOTWMS Secretariat, **2017**

Monitoring Networks –Sea-level -2024



Less / No improvement in Data Sharing

Recommendations – WG2

1. Provide training to increase the capacity for analyzing real-time seismic and sea-level data for tsunami threat to develop NTWC capacity to do own threat analysis * Targeted training for sea level operators.
2. Member States should have a 24/7 NTWC capability.
3. Develop Capabilities & SOPs for **Non-Seismic Tsunami Detection, warning, and dissemination**. Partnerships with other organisations; use text from 183/2024.
4. Encourage member states to adopt **new detection technologies** such as SMART cables, GNSS Network and other technologies to enhance the timelines of tsunami warning to meet the Ocean Decade –ODTP goals.
5. Encourage Member States to sustain the existing observational networks (and expand and fully utilise … in consultation with other entities and encourage expansion on networks in collaboration with other providers in accordance with the ODTP goals and
6. Ensure data robustness and reliability during operations

1. **Optimal observing network implementation:** Develop and design optimal observational networks to increase the density and to improve the timeliness and effectiveness of tsunami early warning systems
2. **Real-Time Data Exchange:** Member states to exchange the real-time data for access by all tsunami warning centers, data including seismic, sea level, and other sensor data. This approach is needed to improve the timeliness and accuracy of tsunami detections and forecasts. – IOTWMS secretariate may need to work with member states to get more stations data in the IO region.
3. **AI and Machine Learning:** Adopt and implement advanced analytical platforms that utilize artificial intelligence and machine learning to integrate and analyze data from multiple sources. This can significantly enhance the predictive accuracy of tsunami models and improve decision-making processes by forecasting potential tsunami impacts more effectively.

- In addition to MG58 MG86, develop guidance on how to the conduct tabletop or similar tsunami warning exercises to review and test SOPs and reduce the potential for complacency among countries that have not experienced a recent tsunami event.
- Develop tsunami warnings in a multi-hazard context to meet the EarlyWarning4All initiatives globally.
- Encourage the member states to make use of Common Alerting Protocol for dissemination.
- Also note communication tests.

Thank you