



32nd Session
of the IOC Assembly
Paris, 23 June 2023

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3.4.1.2

Global Coordination of Warning and Mitigation Systems for Ocean Hazards

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Chair of the TOWS-WG and IOC Vice-Chair
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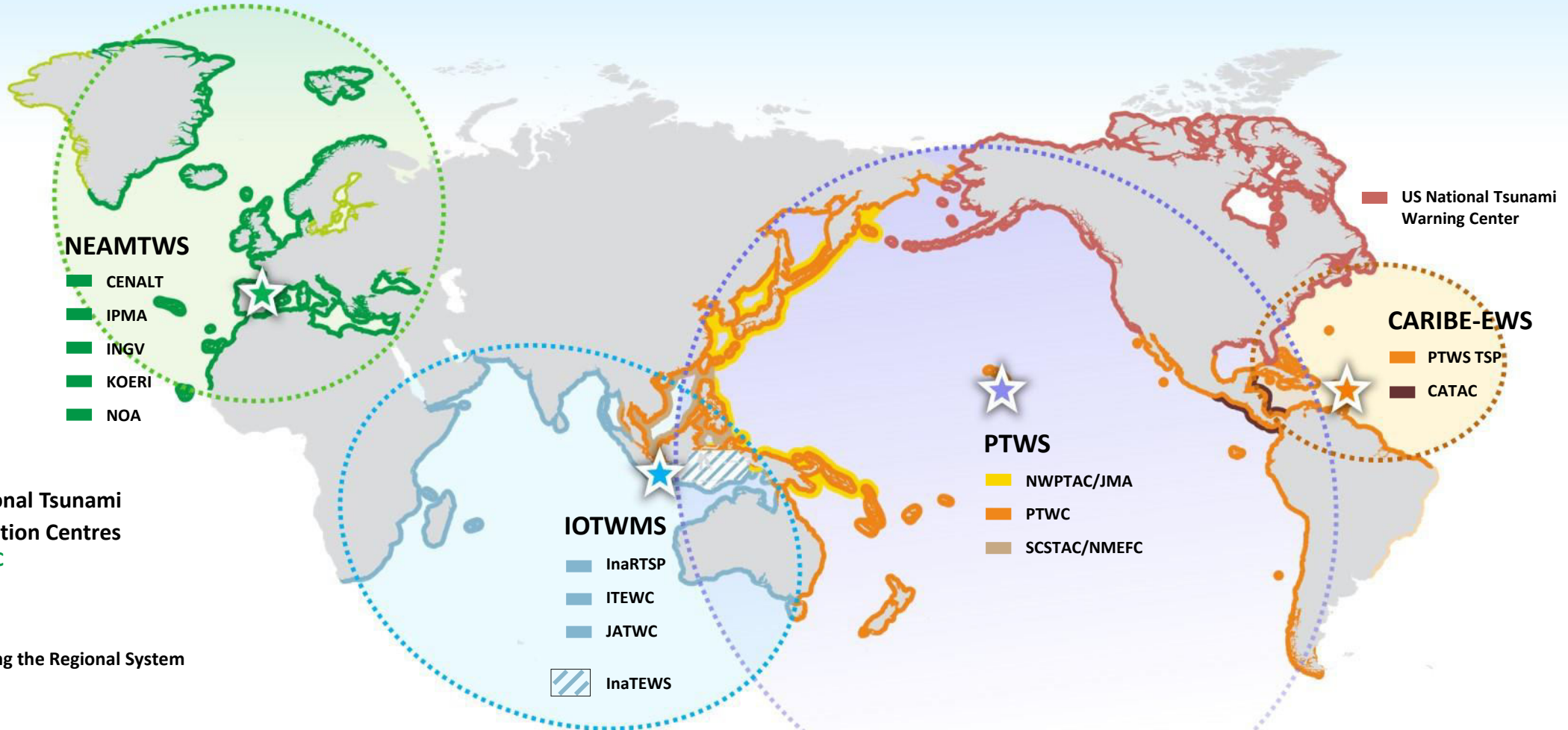


ACKNOWLEDGMENTS:

B. Aliaga

Head of the IOC Tsunami Unit

GLOBAL TSUNAMI WARNING AND MITIGATION SYSTEM



4 Regional Tsunami Information Centres

- NEAMTIC
- IOTIC
- ITIC
- CTIC

Supporting the Regional System

4 Regional Systems

- NEAMTWS
- IOTWMS
- PTWS
- CARIBE EWS

coordinated by the IOC UNESCO

13 Tsunami Service Providers

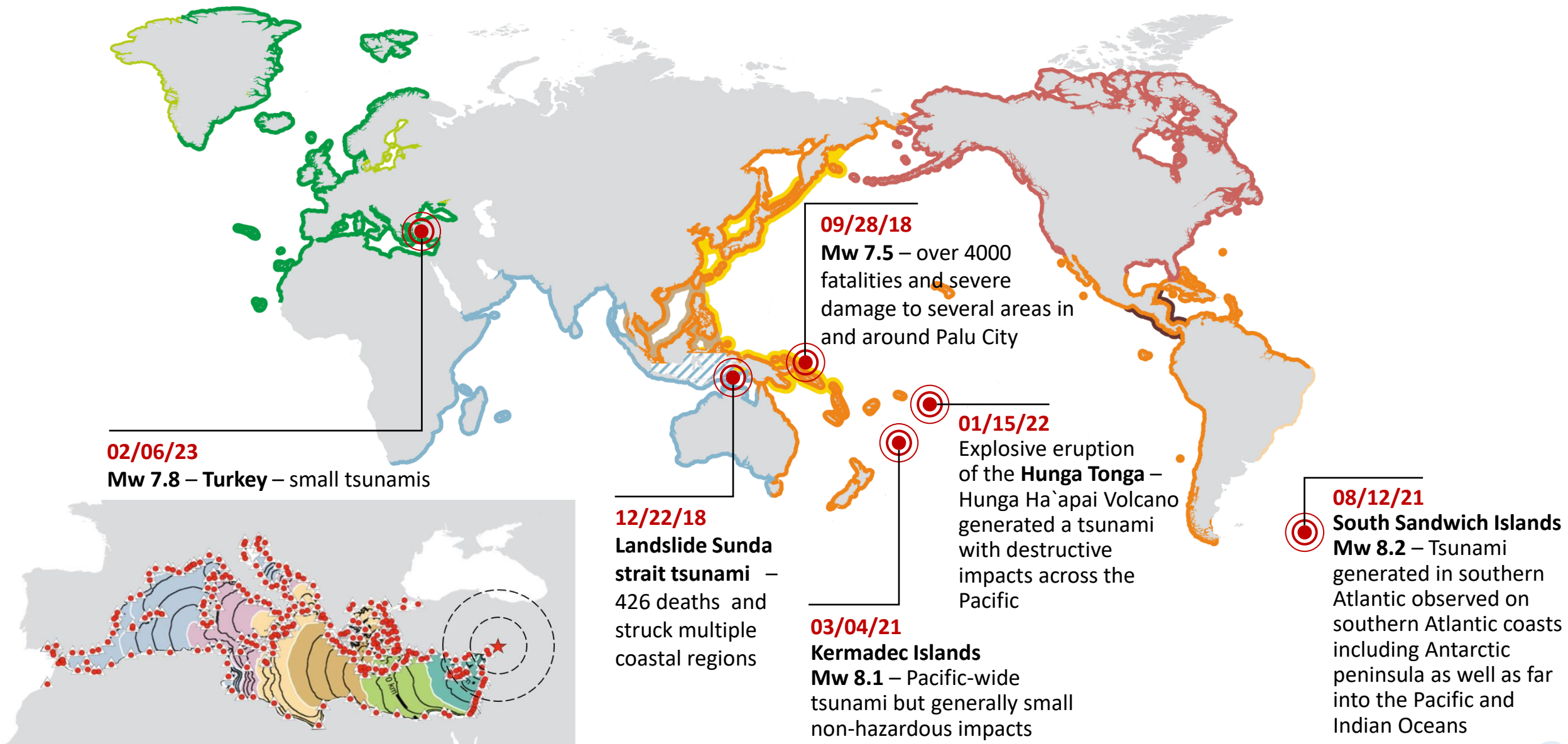
- 5 – NEAMTWS
- 3 – Indian Ocean
- 3 – Pacific Ocean
- 2 – Caribbean via PTWC + CATAC

139 MS

- 36 – SIDS
- 12 – African

have established National Tsunami Warning Focal Points/ National Tsunami Warning Centres

SIGNIFICANT TSUNAMI EVENTS IN THE LAST FIVE YEARS



HUNGA-TONGA HUNGA-HA'APAI (HTHH) SUBMARINE VOLCANIC ERUPTION AND TSUNAMI

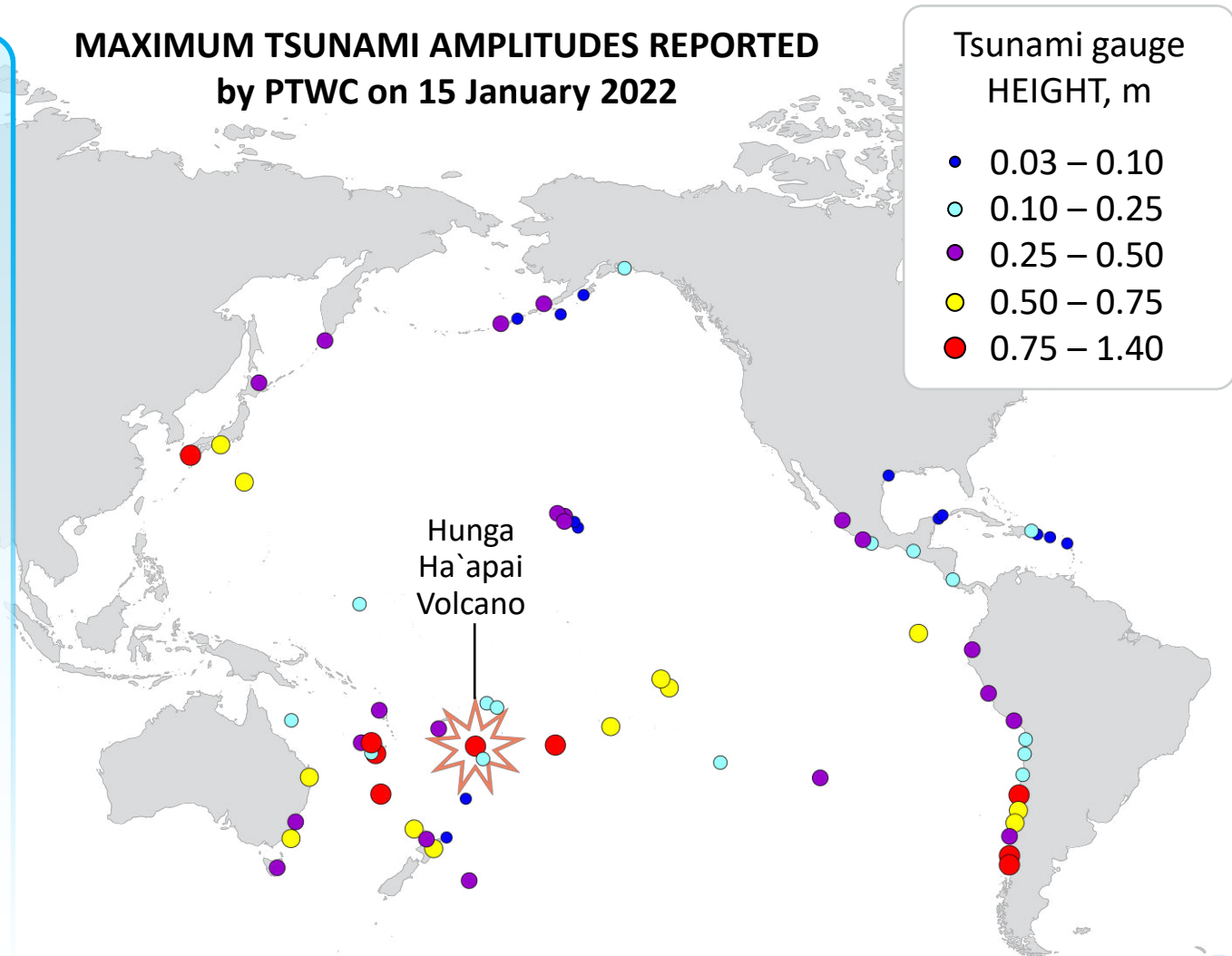
PTWS responses

- Based on sea level data, the Tonga's NTWC issued a tsunami warning at 4:31 UTC (17 min after the explosion)
- The PTWC in Hawaii issued an initial threat bulletin for the entire Pacific Ocean at 6:23 UTC
- ICG/PTWS quickly implemented of the Interim HTHH Volcano Tsunami Response Procedures by 15 March 2022 (CL-2882)
- User's Guide Published (CL-2902)
- The report of the Ad Hoc Team on Tsunamis Generated by Volcanoes is ready for publication

BUT

- Mechanism of tsunami generation is complicated and has not clear yet
- It is challenging to forecast tsunami and issue tsunami warning

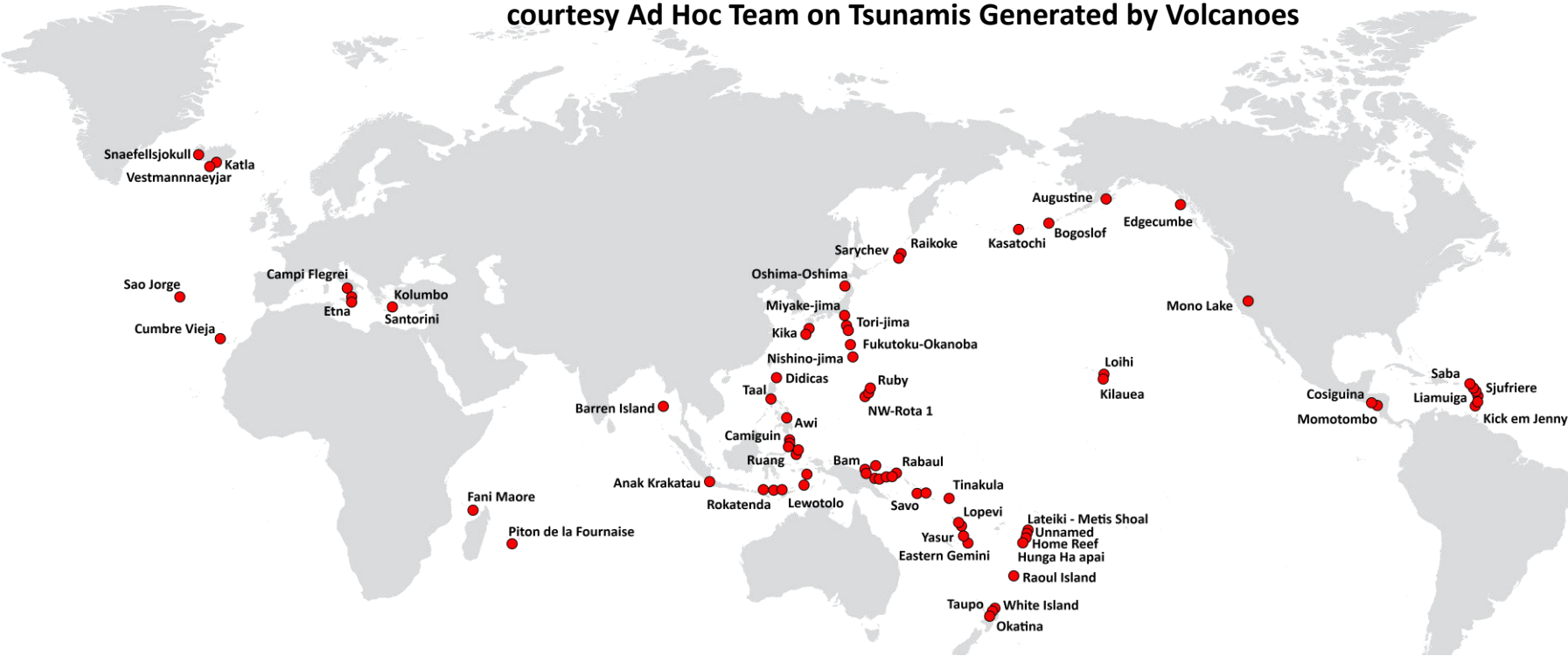
MAXIMUM TSUNAMI AMPLITUDES REPORTED by PTWC on 15 January 2022



TSUNAMIS GENERATED BY VOLCANOES

MAP OF POTENTIALLY TSUNAMIGENIC VOLCANOES

courtesy Ad Hoc Team on Tsunamis Generated by Volcanoes



CHALLENGES

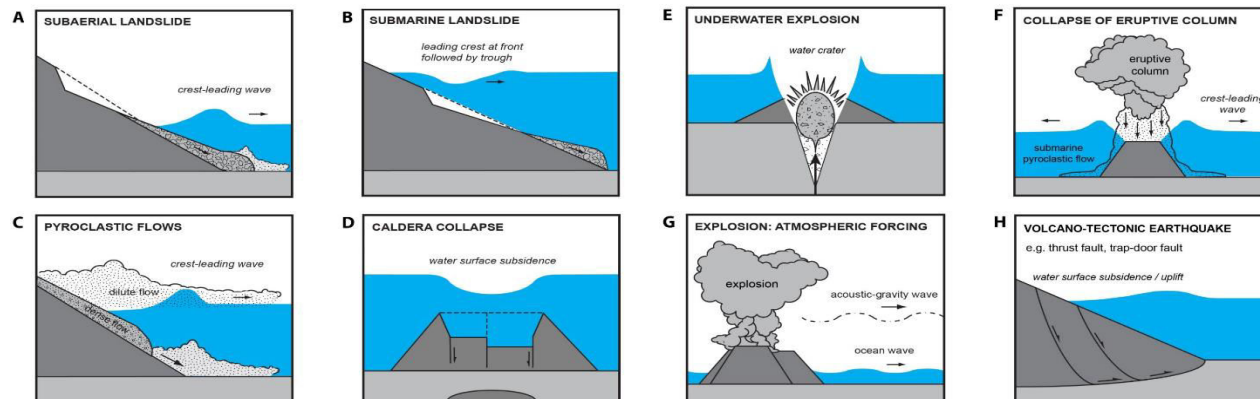
- The source of a tsunami observed during an eruption is often difficult to characterize
- All source mechanisms have different characteristics in terms of location, duration, volume, mass flux, and energy, which have consequences on the wave generated

WHAT'S NEXT?

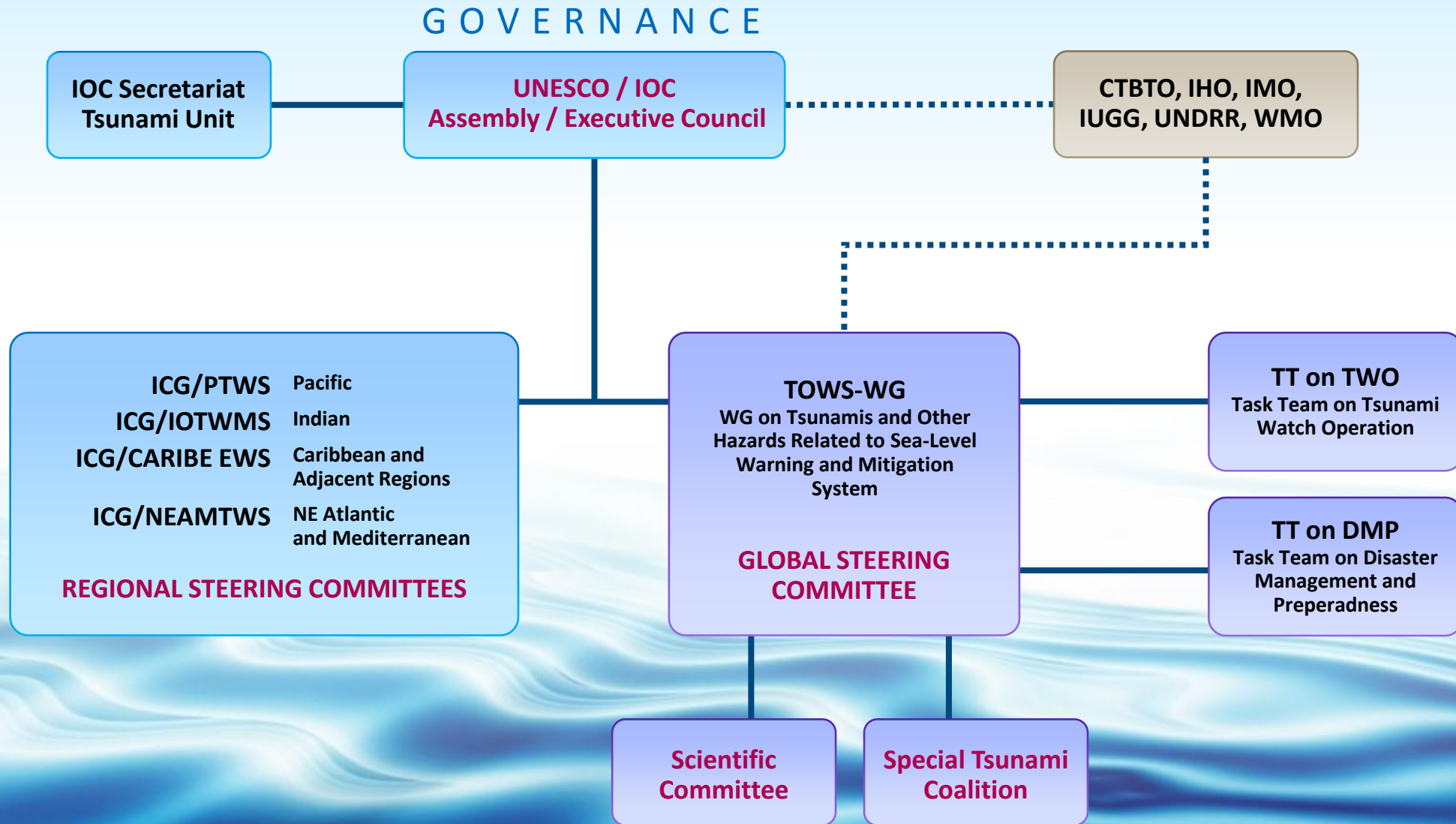
- To make a list of the volcano observatories that monitor and warn of volcanoes that may generate tsunamis
- To send to the volcano observatories a specific questionnaire on the issue
- To develop best practice guidelines of how to warn communities at-risk of the threat from tsunamis generated by volcanic related sources
- To increase public awareness for tsunamis generated by volcanic phenomena and earthquakes

TSUNAMIS GENERATION MECHANISMS BY VOLCANO ACTIVITY AND INSTABILITY

updated from Paris et al., 2014



UN OCEAN DECADE TSUNAMI PROGRAMME



TEN YEARS RESEARCH, DEVELOPMENT & IMPLEMENTATION PLAN FOR THE ODTP

OVERARCHING PRIORITIES

- 1** The first objective of the ODTP is to develop the warning systems' capability to issue actionable and timely tsunami warnings for tsunamis from all identified sources to 100 percent of coasts at risk
- 2** The second objective of the ODTP is that 100 percent of communities at risk to be prepared and resilient to tsunamis by 2030 through efforts like the IOC-UNESCO Tsunami Ready Recognition Programme (TRRP)



KEY ELEMENTS

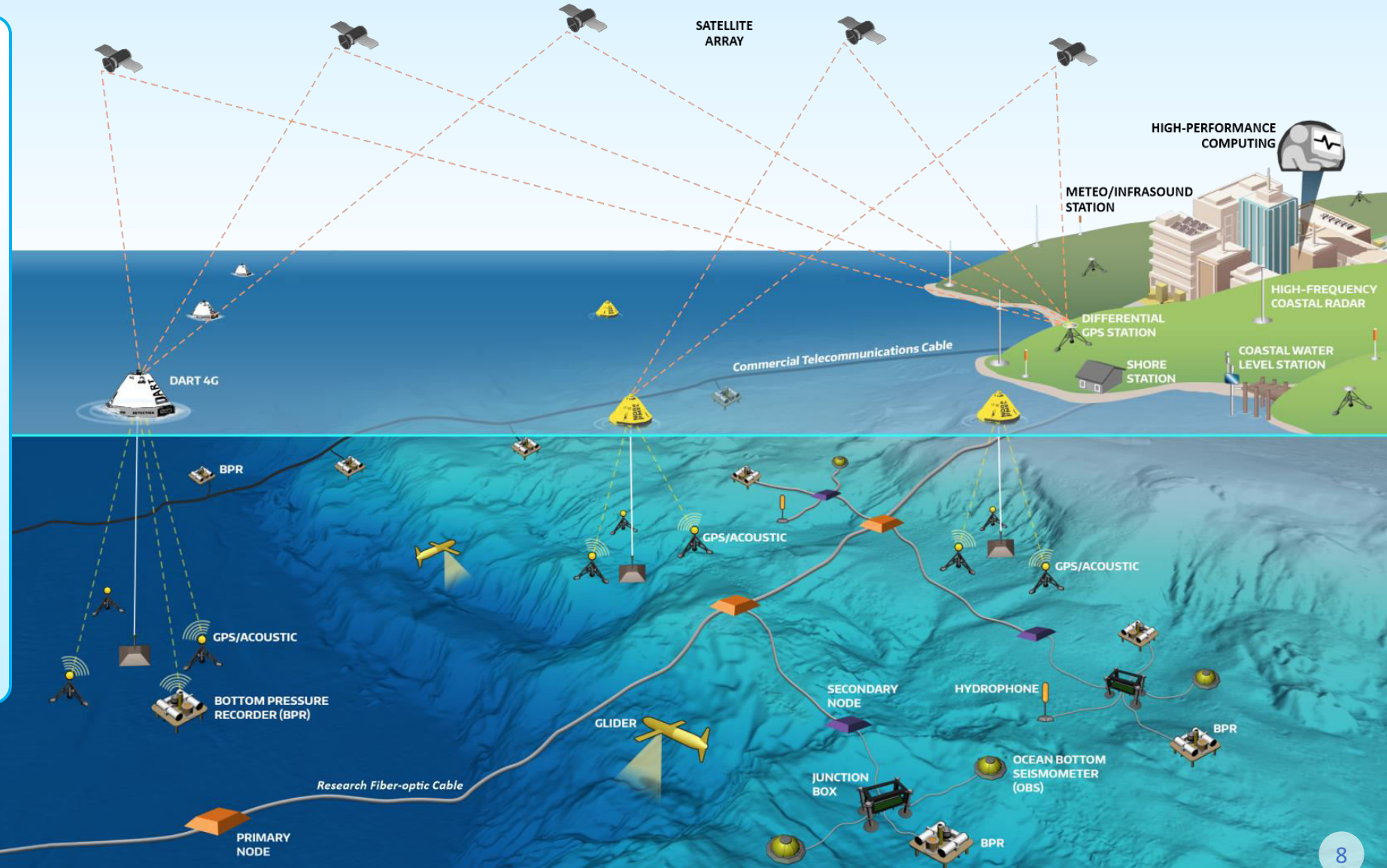
TSUNAMI READY COMMUNITIES

↑
OUTREACH AND EDUCATION

↑
A NEW GENERATION TWS

OCEAN DECADE TSUNAMI PROGRAMME: the Focus Areas Related to Tsunami Warning Capabilities

- Expansion of existing observational systems to fill identified gaps
- Deploy new technologies such as SMART cable
- Wide expansion of data access, availability and analysis capability for real-time sea level, seismic and GNSS-derived land motion data
- Increase access and regularly update the collection of coastal topographic and bathymetric data
- Ensure all NTWCs have access to data, tools and communication platforms, protocols and training



Rethinking Ocean Observations

Source:
National Oceanic and Atmospheric Administration

UNESCO/IOC TSUNAMI READY RECOGNITION PROGRAMME (TRRP)



PLANNING AND RESOURCES

- The TRRP is implemented by Member States, who establish National Tsunami Ready Programmes
- IOC Manual and Guides are available to support the implementation
- For a community to be recognized by UNESCO IOC as Tsunami Ready, all 12 indicators must be met



COORDINATION

- The ICGs will provide mechanisms for the sharing of experience and expertise

UNESCO/IOC TSUNAMI READY RECOGNITION PROGRAMME (TRRP)



SPECIAL TSUNAMI READY COALITION

ToRs



SYMPOSIUM TO COMMEMORATE THE 20th ANNIVERSARY OF THE 2004 INDIAN OCEAN TSUNAMI

- Symposium and Poster Session: 10-14th December 2024 (Aceh, Indonesia)
- The Commemoration day of the 20th Anniversary of the 2004 Indian Ocean Tsunami, 14th December 2024 (Aceh, Indonesia)
- Tsunami Drill and Field Trip to Tsunami Aceh Museum, and Tsunami Ready Community Village in Aceh, 14th December 2024 (Aceh, Indonesia)
- Tsunami Ready Inauguration, 14th December 2024 (Aceh, Indonesia)
- 14th Session of ICG/IOTWMS: December, 16-19th 2024 (Jakarta, Indonesia)



INVITED PARTICIPANTS OF THE SYMPOSIUM

- Countries with lives lost and/or being severely impacted by the 2004 Indian Ocean Tsunami
- Member States of ICG and potentially global
- Youth Organization
- Expert/University
- NGO
- Media



KEY RECOMMENDATIONS (1/2)

THE TOWS-WG RECOMMENDED THE IOC ASSEMBLY AT ITS SESSION IN 2023:

to decide

that warning systems for tsunamis generated by volcanoes should be considered and coordinated as part of the UNESCO/IOC Global tsunami and other Ocean-related Hazards Warning and Mitigation System (GOHWMS), and also when possible be part of a MHEWS

to endorse

the 10-Year Research, Development and Implementation Plan of the Ocean Decade Tsunami Programme as presented in document IOC- 32/3.4.1.2.Doc(1)

to encourage

Member States to provide voluntary financial contributions to the IOC special account and in-kind contributions to support the Ocean Decade Tsunami Programme and UNESCO/IOC Tsunami Ready Recognition Programme

KEY RECOMMENDATIONS (2/2)

THE GROUP RECOMMENDED THE IOC ASSEMBLY AT ITS SESSION IN 2023
TO INSTRUCT THE REGIONAL ICGS (AMONG OTHERS):

to encourage

sea level data is sampled at one second intervals and with the highest available accuracy and transmitted in real-time as a matter of priority

add

the task to the Terms of Reference of the ICGs and TICs to facilitate the implementation and functioning of the UNESCO/IOC Tsunami Ready Recognition Programme

add

the role of ICGs as regional Steering Committees for the ODTP in their Terms of Reference

THANK YOU FOR ATTENTION!
QUESTIONS? COMMENTS?

