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Intergovernmental
Oceanographic
Commission



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development

**55th Session of the
IOC Executive Council
Paris, 15 June 2022**

3.5.1.2

Global Coordination of Warning and Mitigation Systems for Ocean Hazards

Alexander V. FROLOV

Chair of the TOWS-WG and IOC Vice-Chair
(NRC Kurchatov Institute, Russia)

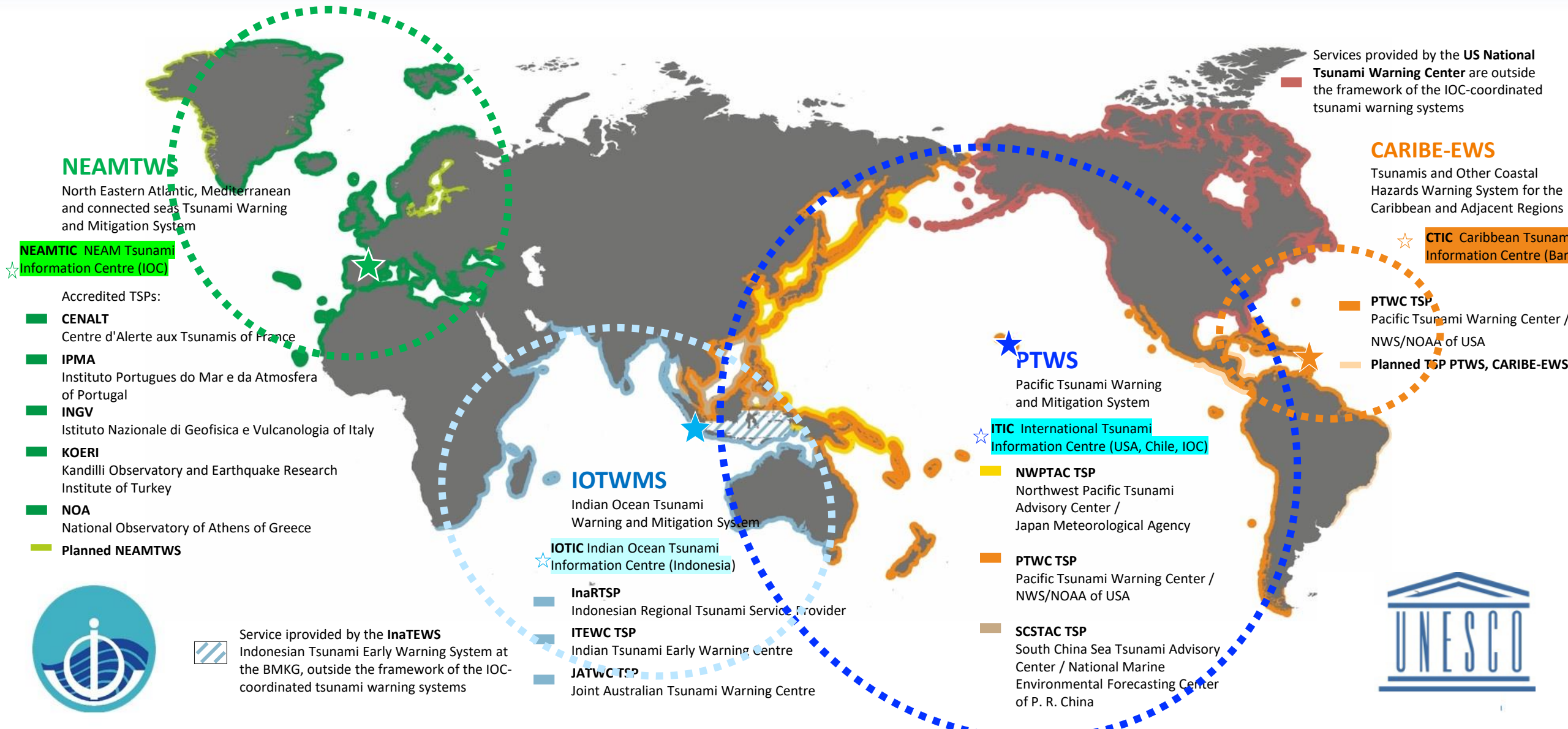
ACKNOWLEDGMENTS:

**B. Aliaga
IOC Tsunami Unit**

GLOBAL TSUNAMI WARNING AND MITIGATION SYSTEM

Intergovernmental Oceanographic Commission of UNESCO

2022 www.ioc-tsunami.org



NEAMTWS

North Eastern Atlantic, Mediterranean and connected seas Tsunami Warning and Mitigation System

NEAMTIC NEAM Tsunami Information Centre (IOC)

Accredited TSPs:

- **CENALT**
Centre d'Alerte aux Tsunamis of France
- **IPMA**
Instituto Portugues do Mar e da Atmosfera of Portugal
- **INGV**
Istituto Nazionale di Geofisica e Vulcanologia of Italy
- **KOERI**
Kandilli Observatory and Earthquake Research Institute of Turkey
- **NOA**
National Observatory of Athens of Greece
- **Planned NEAMTWS**



 Service provided by the **InaTEWS** Indonesian Tsunami Early Warning System at the BMKG, outside the framework of the IOC-coordinated tsunami warning systems

IOTWMS

Indian Ocean Tsunami Warning and Mitigation System

IOTIC Indian Ocean Tsunami Information Centre (Indonesia)

- **InaRTSP**
Indonesian Regional Tsunami Service Provider
- **ITEWC TSP**
Indian Tsunami Early Warning Centre
- **JATWC TSP**
Joint Australian Tsunami Warning Centre

PTWS

Pacific Tsunami Warning and Mitigation System

ITIC International Tsunami Information Centre (USA, Chile, IOC)

- **NWPTAC TSP**
Northwest Pacific Tsunami Advisory Center / Japan Meteorological Agency
- **PTWC TSP**
Pacific Tsunami Warning Center / NWS/NOAA of USA
- **SCSTAC TSP**
South China Sea Tsunami Advisory Center / National Marine Environmental Forecasting Center of P. R. China

Services provided by the **US National Tsunami Warning Center** are outside the framework of the IOC-coordinated tsunami warning systems

CARIBE-EWS

Tsunamis and Other Coastal Hazards Warning System for the Caribbean and Adjacent Regions

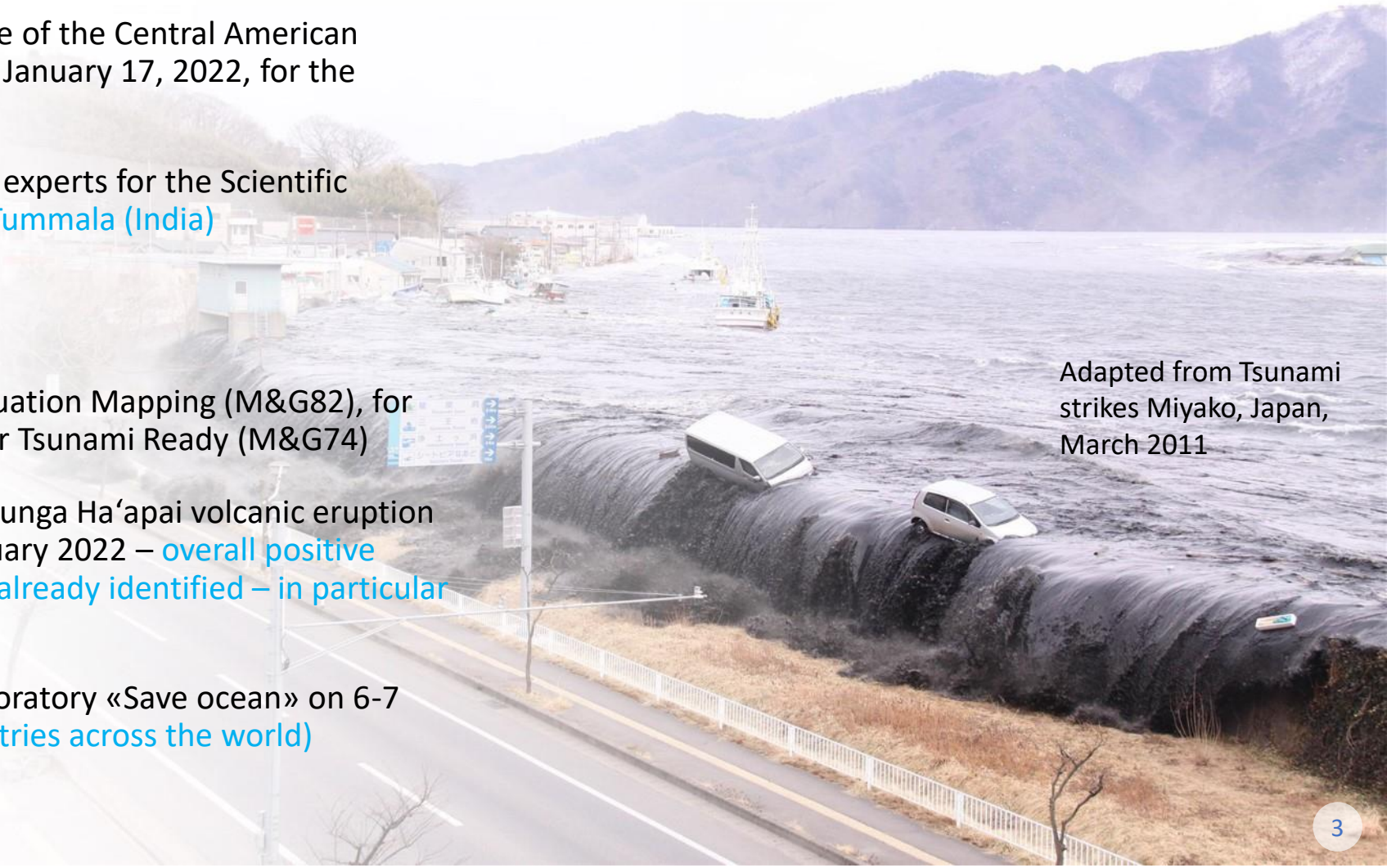
CTIC Caribbean Tsunami Information Centre (Bar)

- **PTWC TSP**
Pacific Tsunami Warning Center / NWS/NOAA of USA
- **Planned TSP PTWS, CARIBE-EWS**



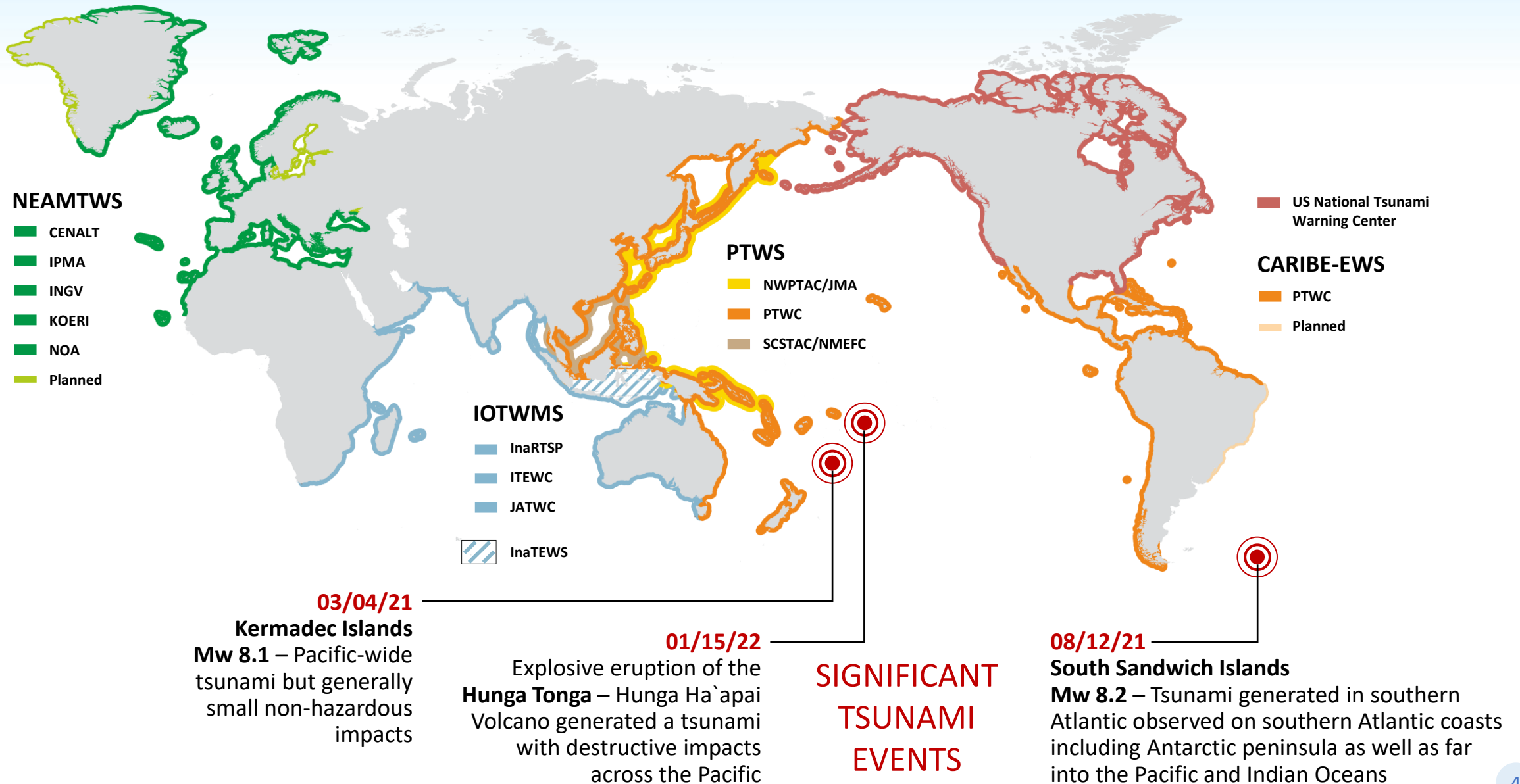
MAJOR ACTIVITIES - INTER-SESSIONAL PERIOD (06/21-06/22)

- 1 TOWS-WG and 2 Task Team meetings
- Full functionality on the interim service of the Central American Tsunami Advisory Center (CATAC) as of January 17, 2022, for the Pacific coasts of Central America
- First online meeting of the selected 11 experts for the Scientific Committee led by Dr Srinivasa Kumar Tummala (India)
- One exercise carried out:
 - CARIBE WAVE 22 (March)
- Guidelines published for Tsunami Evacuation Mapping (M&G82), for Community Exercises (M&G 86) and for Tsunami Ready (M&G74)
- PTWS Response to the Hunga Tonga–Hunga Ha‘apai volcanic eruption and tsunami that happened on 15 January 2022 – overall positive response but a demonstration of gaps already identified – in particular for non-seismic events
- Organizing the fifth Ocean Decade Laboratory «Save ocean» on 6-7 April 2022 (participants from 116 countries across the world)



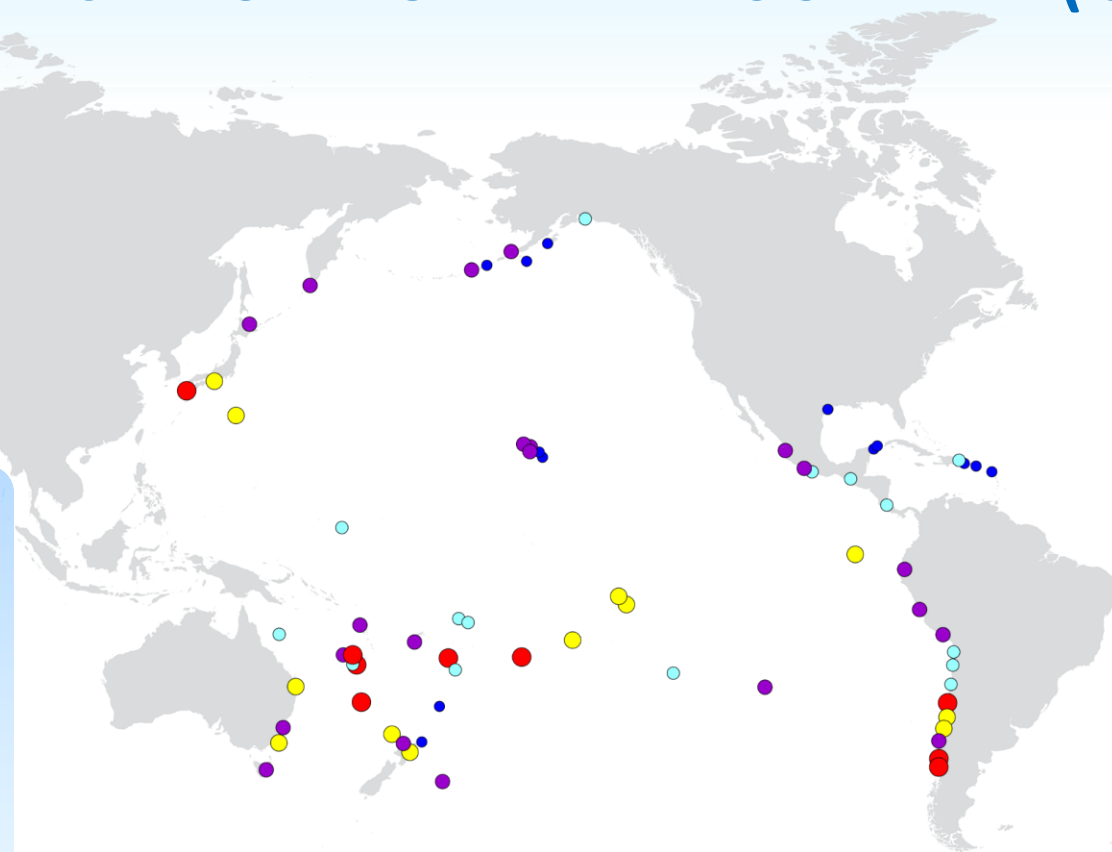
Adapted from Tsunami strikes Miyako, Japan, March 2011

REVIEW OF SIGNIFICANT TSUNAMI EVENTS IN 2021-2022



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

- Based on sea level data, the Tonga's NTWC issued a tsunami warning at 4:31 UTC (17 min after the explosion)
- Fiji, Vanuatu, New Zealand, and Samoa NTWCs issued tsunami warnings at 6:35, 7:35, 7:41 and 8:45 UTC, respectively
- The PTWC in Hawaii issued an initial threat bulletin for the entire Pacific Ocean at 6:23 UTC
- ITIC organized 3 post-event briefings and Member State survey of responses



Tsunami gauge
HEIGHT, m

- 0.03 – 0.10
- 0.10 – 0.25
- 0.25 – 0.50
- 0.50 – 0.75
- 0.75 – 1.40

MAXIMUM TSUNAMI
AMPLITUDES REPORTED
by PTWC on 15 January 2022

KEY PROGRESS:

Mitigation, Preparedness and Awareness

4 Tsunami Information Centers (TICS), one in each ocean basin

27 Regional tsunami exercises conducted globally [7 Pacific, 10 Caribbean, 6 Indian Ocean since 2009, 4 NEAM region) to test the readiness of EWS and prepare coastal communities to tsunami risks

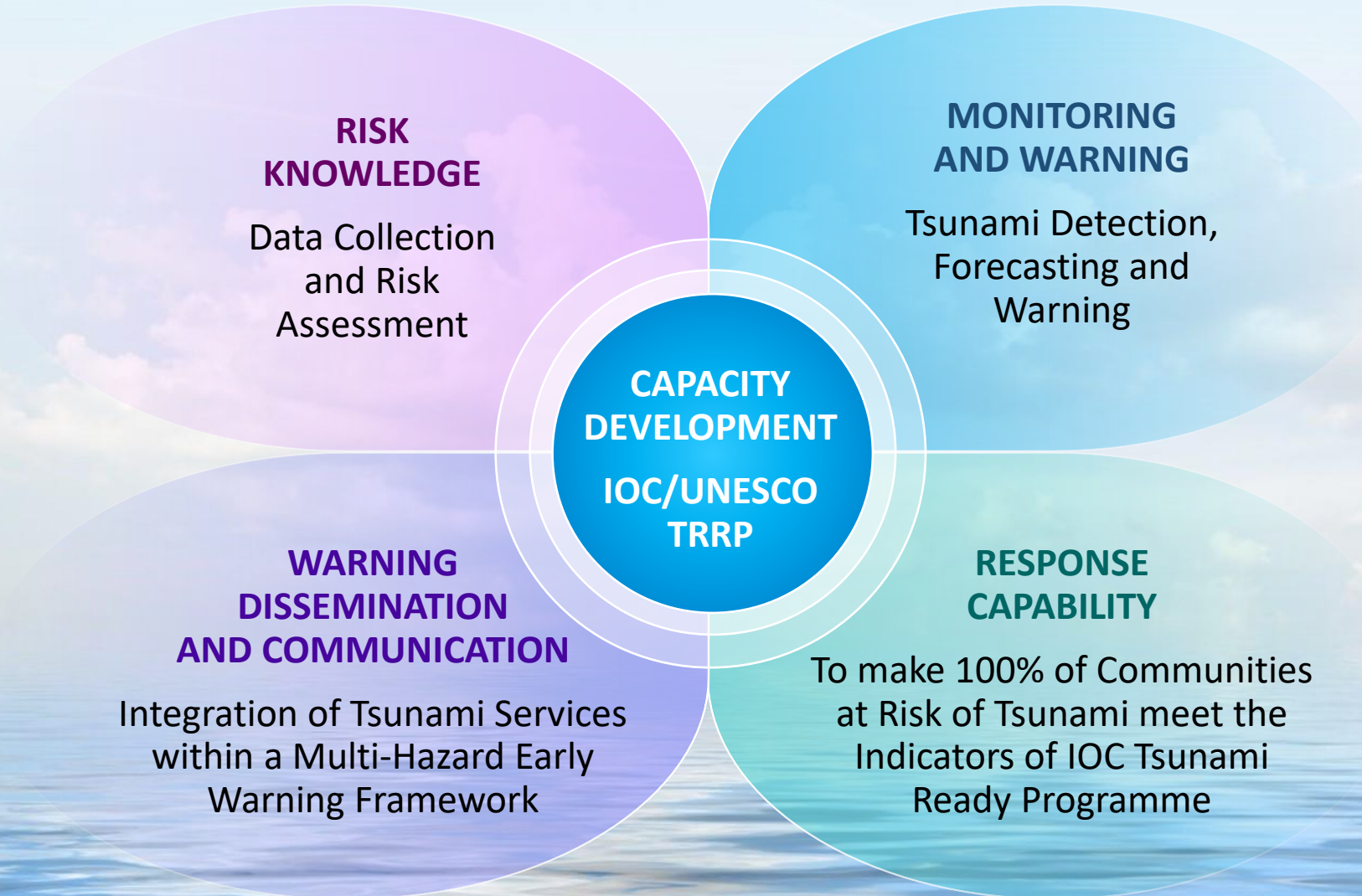
Awareness Growing through World Tsunami Awareness Day in an effective partnership with UNDRR and others, including UNDP and WMO

83 videos co-prepared/published



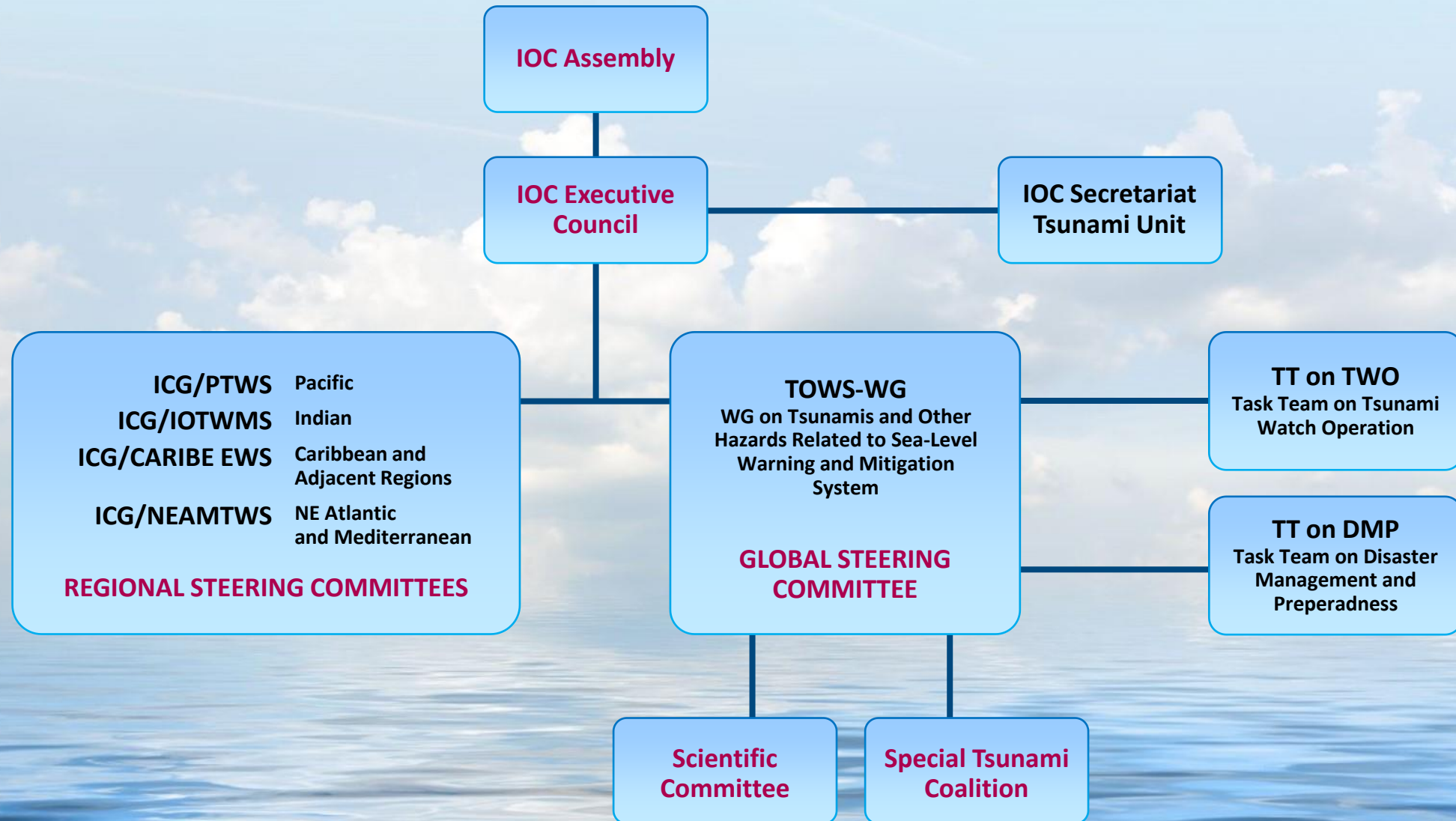
UN OCEAN DECADE TSUNAMI PROGRAMME

Components



UN OCEAN DECADE TSUNAMI PROGRAMME

Governance



SCIENTIFIC COMMITTEE FOR THE OCEAN DECADE TSUNAMI PROGRAMME

Composition

2022-2023

CHAIRPERSON



Srinivasa Kumar Tummala

- All members will serve for a period of two years and would be eligible for renewal once
- In selecting Expert Members, due consideration will be given to geographic, generational and gender balance

INTER-ICG TASK TEAM ON DISASTER MANAGEMENT AND PREPAREDNESS (TT on DMP)



Christa von Hillebrandt



Amir Yahav



Harkunti Pertiwi Rahayu



David Coetzee

INTER-ICG TASK TEAM ON TSUNAMI WATCH OPERATIONS (TT on TWO)



Silvia Chacon



Srinivasa Kumar Tummala



François Schindele



Yutaka Hayashi

THE WORKING GROUP ON TSUNAMIS AND OTHER HAZARDS RELATED TO SEA-LEVEL WARNING AND MITIGATION SYSTEMS (TOWS-WG)



Michael Angove



Sergio Barrientos



Alexander Rabinovich

UNESCO/IOC TSUNAMI READY RECOGNITION PROGRAMME (TRRP)



IOC TSUNAMI READY INDICATORS

ASSESSMENT

- Tsunami hazard zones are mapped & designated
- The number of people at risk in the tsunami hazard zone is estimated
- Economic, infrastructural, political & social resources are identified

PREPAREDNESS

- Easily understood tsunami evacuation maps are approved
- Tsunami information including signage is publicly displayed
- Outreach & public awareness & education resources are available & distributed
- Outreach or educational activities are held at least 3 times a year
- A community tsunami exercise is conducted at least every 2 years

RESPONSE

- A community tsunami emergency response plan is approved
- The capacity to manage emergency response operations during a tsunami is in place
- Redundant & reliable means to timely receive 24-hour official tsunami alerts are in place
- Redundant & reliable means to timely disseminate 24-hour official tsunami alerts to the public are in place



AIM

To build resilient communities through awareness and preparedness strategies that will protect life, livelihoods and property from tsunamis in different regions



COLLABORATION

This is achieved through a collaborative effort to meet a standard level of tsunami preparedness through the fulfilment of a set of 12 established indicators

SPECAIL TSUNAMI READY COALITION

ToRs



UN OCEAN DECADE TSUNAMI PROGRAMME

THE MAIN SOCIAL OUTCOME

TO MAKE
100%

OF COMMUNITIES AT RISK OF TSUNAMI
PREPARED FOR AND RESILIENT TO TSUNAMIS

BY
2030

KEY RECOMMENDATIONS (1/2)

- The Group recommended **amendments to its Terms of Reference**, including new functions assigned to it by Decision IOC-31/3.4.1 in the context of the UN Ocean Decade.
- The Group recommended that the IOC Executive Council at its 55th session consider **approving the establishment of the UNESCO/IOC Tsunami Ready Recognition Programme (UNESCO/IOC TRRP)**.
- The Group recommended to **approve the Terms of Reference for the Tsunami Ready Coalition**; the Group instructed the Task Team on Disaster Management and Preparedness to develop a workplan for 2022–2024 and propose a candidate for appointment as Chair of the Tsunami Ready Coalition for the period 2022–2024.

KEY RECOMMENDATIONS (2/2)

The Group recommended the IOC Executive Council at its session in 2022 **to instruct the regional ICGs:**

- to encourage sea-level network operators to undertake regular and routine calibration of their sea-level monitoring instrumentation, following recommendations of IOC Manuals & Guides, 3 and 14 (Volumes I – V);
- to routinely monitor the status of seismic and sea-level related observing networks to identify and better help rectify gaps in coverage and free and open data exchange;
- the addition of the task to facilitate the UNESCO/IOC Tsunami Ready Recognition Programme to the Terms of Reference of each regional ICG Tsunami Information Centres.

THANK YOU FOR ATTENTION!
QUESTIONS? COMMENTS?

