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# UN OCEAN DECADE TSUNAMI PROGRAMME

Report to ICG/PTWS  
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The **Thirty-first Session** of the Intergovernmental Oceanographic Commission (of UNESCO) Assembly (14-25 June 2021) approved the establishment of the **Ocean Decade Tsunami Programme**, a Scientific Committee to prepare the Draft 10-Year Research, Development and Implementation Plan and Tsunami Ready Coalition

*“...this programme will seek to ensure that a country's ability to prepare for, defend against and recover from the tsunami threat is not dependent on what it can afford.”*

*Alexander Frolov, Jul 2021*

# OCEAN DECADE TSUNAMI PROGRAMME: Seeking Major Advances in SCIENCE and PREPAREDNESS

New observational and analysis technologies to move from a **high-uncertainty** assumption-based capability to a **low-uncertainty** dynamic-based capability

## RESILIENCE!

Communities respond to tsunami threats by combining accurate **real-time impact forecasts** with **deep community preparedness**.  
Tsunami disaster impacts are minimized, enabling rapid restoration of critical infrastructure and services

Comprehensive community outreach, education, and capacity building efforts aimed at achieving **IOC Tsunami Ready** designation across all socio-economic categories



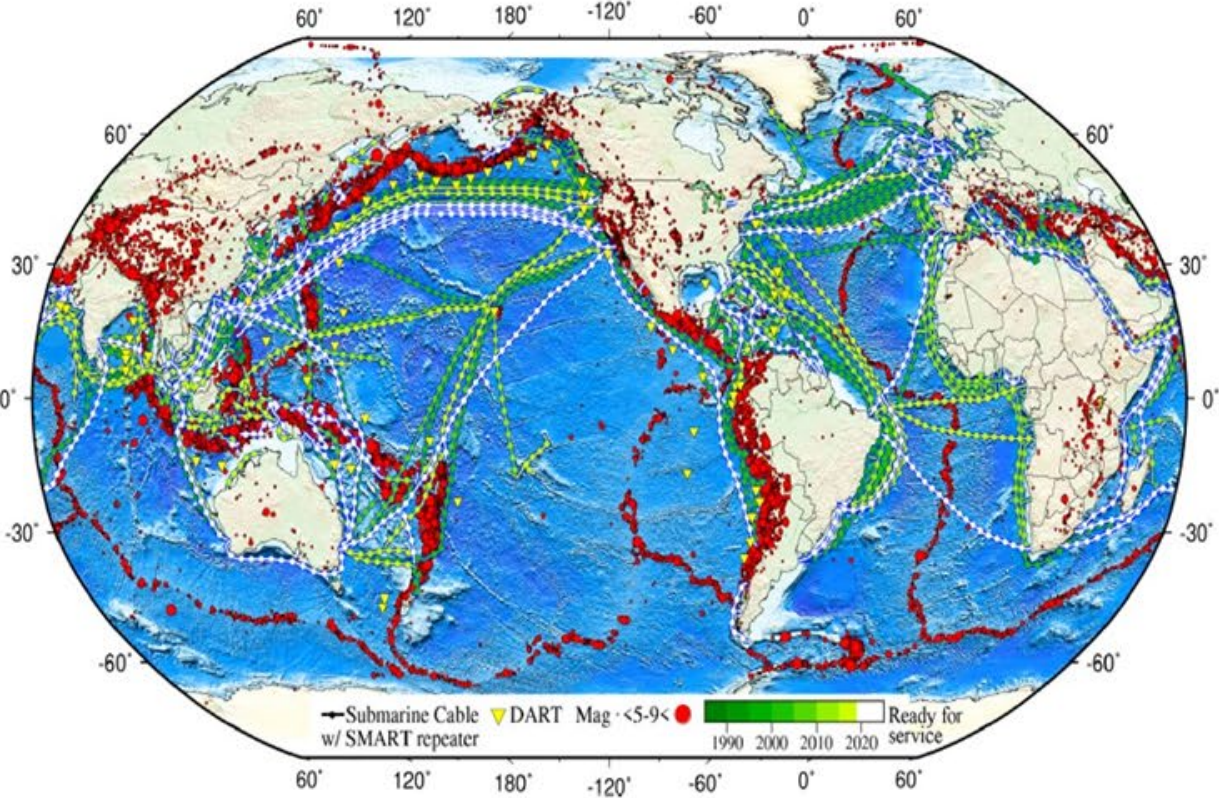
# CHALLENGES AND OPPORTUNITIES FOR THE DEVELOPMENT OF THE GLOBAL TSUNAMI WARNING SYSTEM

- High-resolution mapping of all tsunami-vulnerable coastlines (topography and bathymetry)
- Improve data exchange:
  - bathymetry,
  - seismic,
  - sea level,
  - GNSS,
  - Digital Earth Elevation data
- Improve speed of tsunami detection and measurement system on the basis of new technologies (including near-field and non-seismic tsunamis)
- Scale up the IOC Tsunami Ready programme
- Increase capacities for tsunami warning and mitigation in SIDS/LDS
- Ensure interoperability with other components of a global coastal Multi-Hazard Early Warning System (MHEWS)



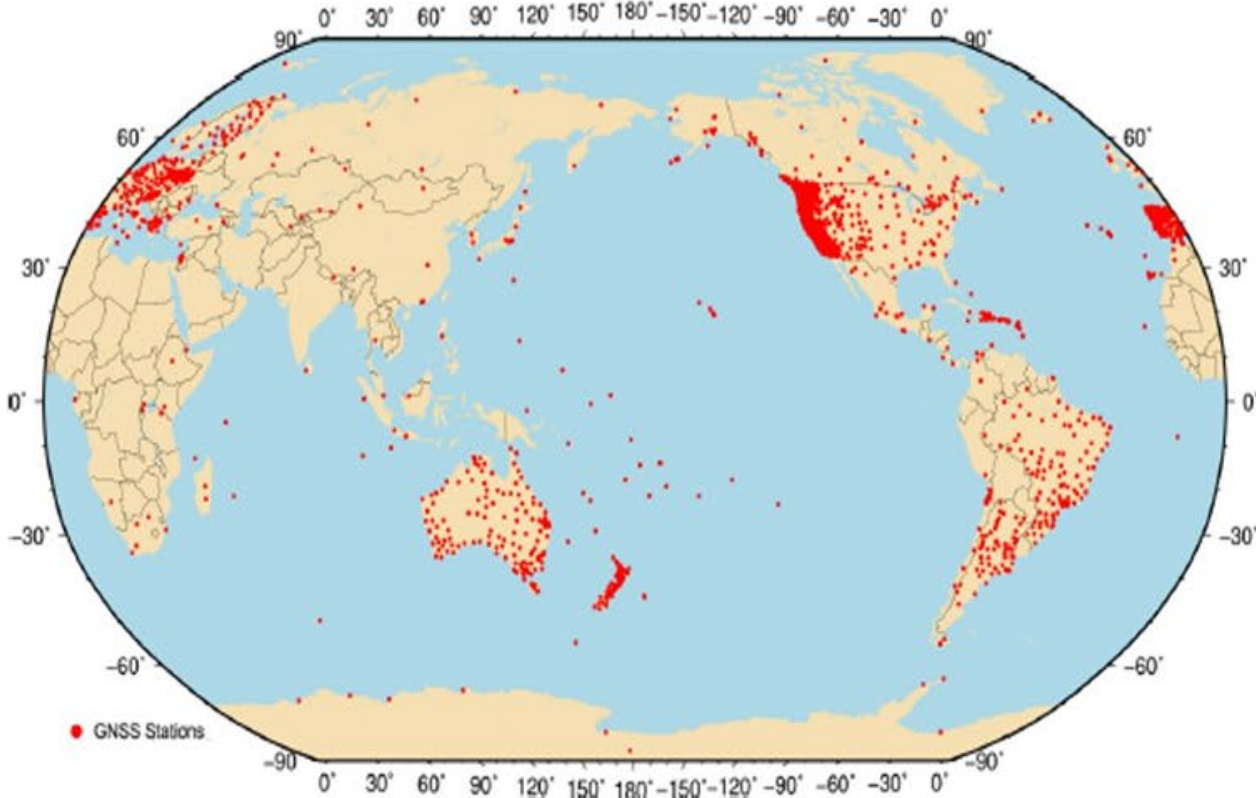
# NEW POTENTIAL SOURCES OF SEISMIC OBSERVATIONS FOR TSUNAMI WARNING SYSTEMS

Locations and magnitudes of historical seismic events (red), DART tsunami buoys (yellow triangles) and current (green) and planned (white) submarine cables, SMART repeaters shown every 300 km



Angove, M . et. al, 2019

The location of 2,260 real-time GNSS stations from public networks around the world

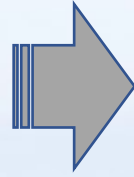


Pacific Northwest Geodetic Array/Central Washington University

# THE OCEAN DECADE TSUNAMI PROGRAMME

## Planning overview

The TOWS-WG will perform Global Steering Committee functions



A special Coalition for Tsunami Ready will be established in collaboration with other critical stakeholders



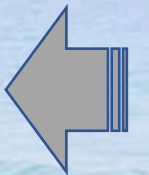
A Scientific Committee with an advisory role for the duration of the programme will be established



**MEMBER STATE CONTRIBUTIONS IDENTIFIED AND APPLIED**



The Scientific Committee will be tasked to develop a Draft 10-Year Research, Development and Implementation Plan for the programme for endorsement by the TOWS-WG at its next session



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# Potential PTWS Contributions

1. Support Governance
  - a. Establish **Task Team** to facilitate and guide UN Ocean Decade Tsunami Programme implementation within PTWS
  - b. Inter-ICG Coordination on Decade matters
2. Identify, scope, and conduct **Projects** and **Experiments**
  - a. SMART
  - b. GNSS
  - c. DART
3. Tsunami Ready
  - a. Assume **lead role** in **Tsunami Ready Coalition**
  - b. Scale up implementation - regional resource hubs (establish 'community of practitioners'), online training and support
4. Conference and forum **Representation**
  - a. UN Ocean Decade Laboratories and Themed Events
  - b. Professional conferences (e.g. ITU, IUGG (IASPEI, IAVCEI IAPSO), AGU/EU/)
  - c. UN and Regional (UNESCAP, UNDP, ASEAN, SPC, CEPREDENAC, CPSS, etc)
5. **Capacity Development** and Education
  - a. Support Ocean Teacher Global Academy to develop and provide tsunami training (ITIC, Indonesia BMKG, other Regional and Country Training Centres)
  - b. Encourage involvement of Early Career Professionals and promote gender-balanced participation in tsunami activities



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## **Steps identified by PTWS SC Meeting:**

1. ICG/PTWS SC (or ad hoc team) to:
  - a. Draft recommendation for ICG/PTWS-XXIX (establish Task Team)
  - a. Draft TT Terms of Reference
  - b. Solicit nominations for TT membership
1. ICG/PTWS-XXIX (Nov 2021) Session to approve (a)-(c)



# Draft Recommendation: ICG/PTWS-29

**Recognizing** the UN Decade for Ocean Science for Sustainable Development as a once-in-a-lifetime opportunity to realize transformative ocean science solutions,

**Recognizing** the UN Decade for Ocean Science societal goals include a Safe Ocean, where life and livelihoods are protected from ocean-related hazards, such as tsunamis.

**Recalling** Recommendation ICG/PTWS-XXVIII.6 (2019) for PTWS Member States to actively support the Ocean Decade through contributions of existing and new data, and promotion of the Decade programs as part of their national platforms and priorities.

**Noting** the guiding document *Protecting Communities from the World's Most Dangerous Waves: A Framework for Action under the UN Decade of Ocean Science for Sustainable Development*, submitted for consideration to the 14th Session of the TOWS WG.

**Noting** Recommendation TOWS-WG-14 to establish an Ocean Decade Tsunami Programme with a 10-year Research, Implementation and Development Plan, along with a Scientific Committee and Tsunami Ready Coalition to guide its implementation.

**Noting** the Thirty-first Session of the Intergovernmental Oceanographic Commission (of UNESCO) Assembly (14 – 25 June 2021) approved the establishment of the Ocean Decade Tsunami Programme, a Scientific Committee to prepare the Draft 10-Year Research, Development and Implementation Plan and Tsunami Ready Coalition.

**Recognizing** that 'Ocean Science' should be interpreted broadly as encompassing: social sciences and human dimensions; the infrastructure that supports ocean science (observations, data systems); the application of those sciences for societal benefit, including knowledge transfer and applications in regions that are lacking science capacity; and the science-policy/user interface. The integration of traditional knowledge in ocean research will also be promoted in the context of the Decade.

**Decides** to establish an ICG/PTWS Task Team on the Ocean Decade under the PTWS Steering Committee with Terms of Reference as below.

**Urges** Member States to engage and contribute to the co-design and co-delivery of Ocean Science for Sustainable Development and the Ocean Decade Tsunami Programme;

**Decides** to include a permanent agenda item on the Ocean Decade in the Policy section of its regular meetings.



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## Draft Terms of Reference: PTWS UN Decade TT

### Terms of Reference:

1. Provide input to the Ocean Decade Tsunami Programme on behalf of the ICG/PTWS
2. Identify, facilitate, compile and maintain a list of PTWS contributions to the UN Ocean Decade Tsunami Programme in support of its 10-year Scientific Research, Implementation and Development Plan
3. Serve as a clearinghouse for the coordination of UN Decade efforts with other ICGs, regional partners and other stakeholders including the private sector.
4. Report to ICG/PTWS on an bi-annual basis and to the ICG/PTWS Officers on a regular basis.

### Task Team Membership:

The Task Team will be composed of members nominated by Member States, representatives from each Technical and Regional Working Group, representatives for each ICG designated TSPs, ITIC, and invited experts and observers, with a Chair and a Vice-Chair to be elected by the ICG. Where possible, the Task Team will strive for a membership that reflects the geographic and language diversity of the ICG/PTWS and strive to achieve gender balance.

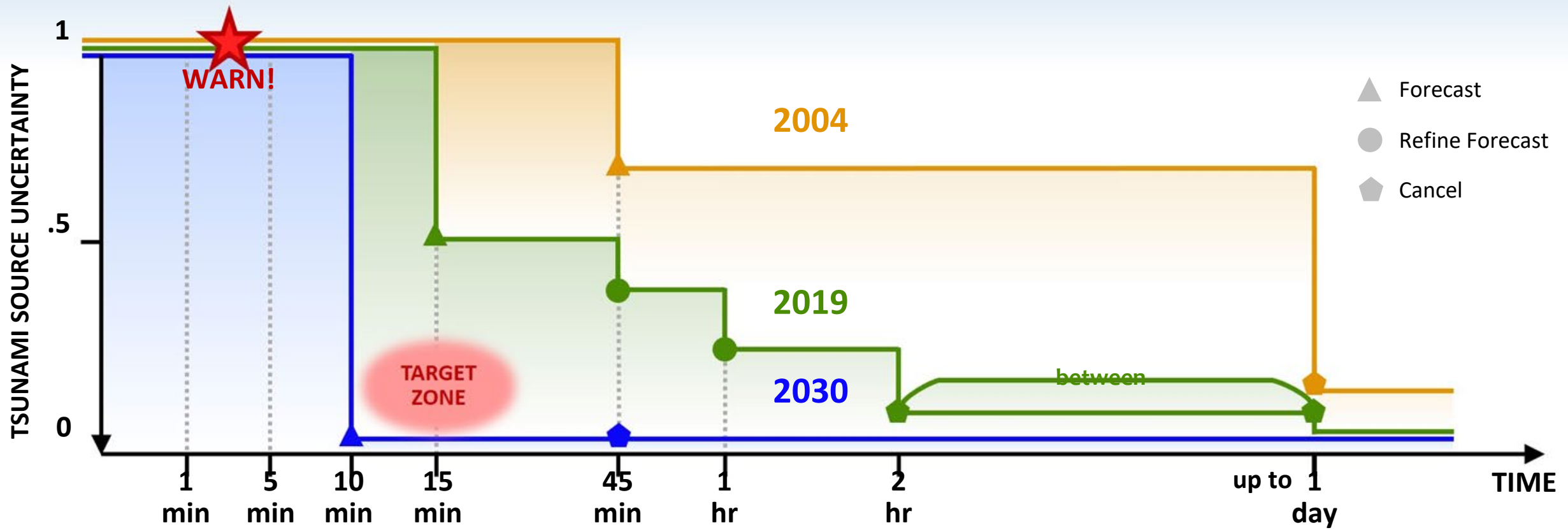


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**THANK YOU**

# GOAL: RELIABLE IMPACT FORECASTS WITHIN 10 MINUTES OF ORIGIN



**LOCATION AND MAGNITUDE (initial)**

**CENTROID MOMENT TENSOR (seismic)**

**COASTAL SEA LEVEL**

**DART II**

**FINITE FAULT MODEL (seismic)**

**FINAL ANALYSIS**

- ▲ Centroid Moment Tensor (GNSS)/Finite Fault Model (GNSS)
- ▲ Full Bottom Pressure (eg. Tsunameters, Cables, dedicated observatories)
- ▲ In-situ Accelerometers

**Data Availability 2004—2030**

Angove et. all, 2019

# THE OCEAN DECADE TSUNAMI PROGRAMME

## the Focus Areas Related to Tsunami Preparedness

### THE MAIN SOCIAL OUTCOME

TO MAKE  
**100%**

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

BY  
**2030**