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Commission



2021 United Nations Decade
of Ocean Science
2030 for Sustainable Development

UN Decade for Ocean Science for Sustainable Development

*Ardito Kodijat, Dr. Laura Kong
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International Tsunami Information Centre (ITIC)*

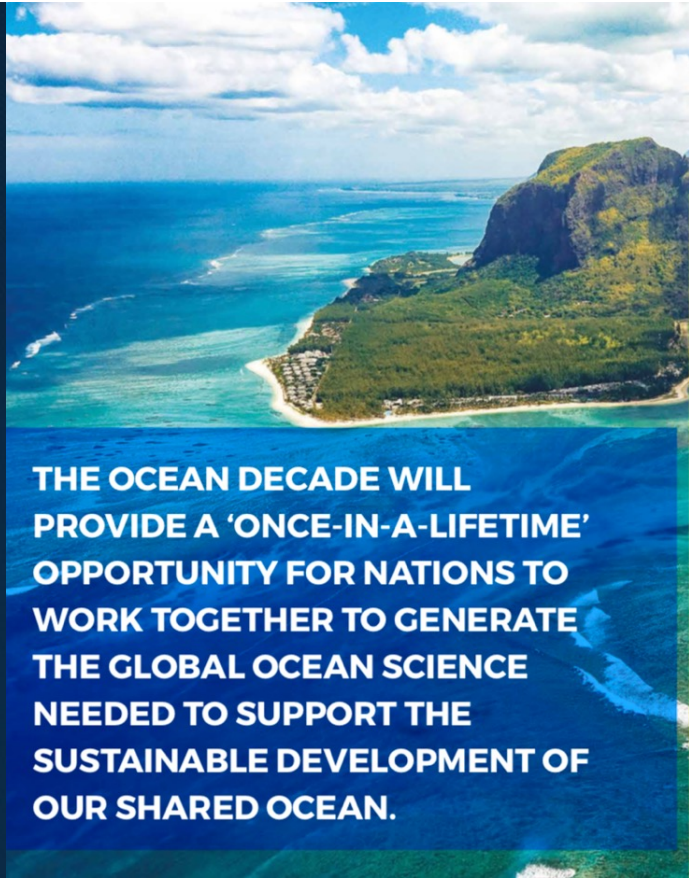
The Science We Need for the Ocean We Want



The United Nations
Decade of Ocean Science
for Sustainable Development
(2021-2030)



2021 United Nations Decade
2030 of Ocean Science
for Sustainable Development



**THE OCEAN DECADE WILL
PROVIDE A 'ONCE-IN-A-LIFETIME'
OPPORTUNITY FOR NATIONS TO
WORK TOGETHER TO GENERATE
THE GLOBAL OCEAN SCIENCE
NEEDED TO SUPPORT THE
SUSTAINABLE DEVELOPMENT OF
OUR SHARED OCEAN.**



Decade Challenge 6:
Increase community
resilience to ocean hazards
(e.g., early warning)

Decade Challenge 7:
Expand the global ocean
observing system

Societal Outcome 5:
Safe Ocean

Actions – Projects:
SMART will strengthen
Tsunami Early Warning
System

- ⇒ Faster Detection
- ⇒ Better Forecasts
- ⇒ Faster warning save lives

NEWLY ENDORSED DECADE ACTION THE OCEAN DECADE TSUNAMI PROGRAMME



Lead Institution: Intergovernmental Oceanographic Commission - IOC-UNESCO



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2021 United Nations Decade
of Ocean Science
for Sustainable Development

#OceanDecade

Unesco - Intergovernmental Oceanographic Commission
October 24 at 8:02 AM · 🌐

👉 **ANNOUNCEMENT** 👈

🌐 'The Ocean Decade Tsunami Programme' is our newly endorsed Decade Action ! This Programme will focus on rapid #tsunami detection 📡, measurement and forecasting capabilities, implementation of #TsunamiReady communities & related capacity development efforts, specifically targeting #SIDS and #LDCs. 📄 <https://bit.ly/3gG331a>

👉 The Call for Decade Actions No. 04/2022 is open ! 📄 'The #OceanDecade Tsunami Programme' is receiving project applications. 📄 Learn + 👉 <https://bit.ly/3sabYe8>

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ENGLISH JOIN

ACTIONS

Meet all the endorsed Ocean Decade Actions

← ALL ACTIONS 🔍 🌐 📄

The Ocean Decade Tsunami Programme
Intergovernmental Oceanographic Commission of UNESCO, IOC-UNESCO - France

Increase community resilience to ocean hazards, Indian Ocean, North Atlantic Ocean, North Pacific Ocean, Programme, South Atlantic Ocean, South Pacific Ocean

Progress actions is envisioned particularly in the fields of rapid tsunami detection, measurement and forecasting capabilities, implementation of Tsunami Ready communities and related capacity development efforts, specifically targeting SIDS and LDCs.

Additionally, the ambition is to identify and advance specific actions that align with the components of LUNDRR People-centered early warning systems including:

1. Risk Knowledge
 - (i) Improve our understanding of the tsunami hazard by expanding our knowledge of past or potential tsunami sources
 - (ii) Fully understand the impacts to critical infrastructure and marine assets and how to minimize them
2. Monitoring and Warning
 - (i) More quickly detect and measure tsunamis directly through ocean observations to include instrumentation of undersea cables
 - (ii) Ensure critical tsunami generation parameters are identified through the optimal use and real-time sharing of new and existing sensors and data
 - (iii) Leverage the Nigerian Foundation-GIEMCO Seabed 2030 hydrographic survey initiative to ensure nearshore coastal zones have complete bathymetric/topographic data coverage at the required resolution
3. Warning Dissemination and Communication
 - (i) Ensure full integration of tsunami services within a multi-hazard early warning framework
 - (ii) Facilitate development of warning dissemination and communication options that are appropriate to geographic, demographic, and infrastructure conditions for the timely dissemination of warnings
4. Response Capability
 - (i) Tsunami evacuation maps must be available for all coastal communities
 - (ii) Ensure that 100% of communities at risk of tsunami around the world meet the indicators outlined in the IOC-UNESCO Tsunami Ready programme
 - (iii) Ensure plans to minimize impacts to critical infrastructure and marine assets are in place to enable quicker post-tsunami restoration of services
5. Capacity Development and attention to SIDS and LDCs
 - (i) Enhanced capacity development is necessary for the understanding of the tsunami hazard to enhance timely warning, response and resilience
 - (ii) Ensure that SIDS and LDCs are fully integrated into all development phases of the global 'Tsunami Warning and Mitigation System

Start Date: 01/09/2022
End Date: 31/12/2030
Lead Contact: Bernardo Aliaga (b.aliaga@unesco.org)

THE OCEAN DECADE
The Global Stakeholder Forum

GET IN TOUCH
Contact us for more information about how you can be involved with The Ocean Decade.

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ACTIONS

Meet all the endorsed Ocean Decade Actions

The Ocean Decade Tsunami Programme

Intergovernmental Oceanographic Commission of UNESCO, IOC-UNESCO -
France

Lead by the Intergovernmental Oceanographic Commission of UNESCO, IOC-UNESCO - France

1. Risk Knowledge

- (i) Improve our understanding of the tsunami hazard by expanding our knowledge of past or potential tsunami sources
- (ii) Fully understand the impacts to critical infrastructure and marine assets and how to minimize them

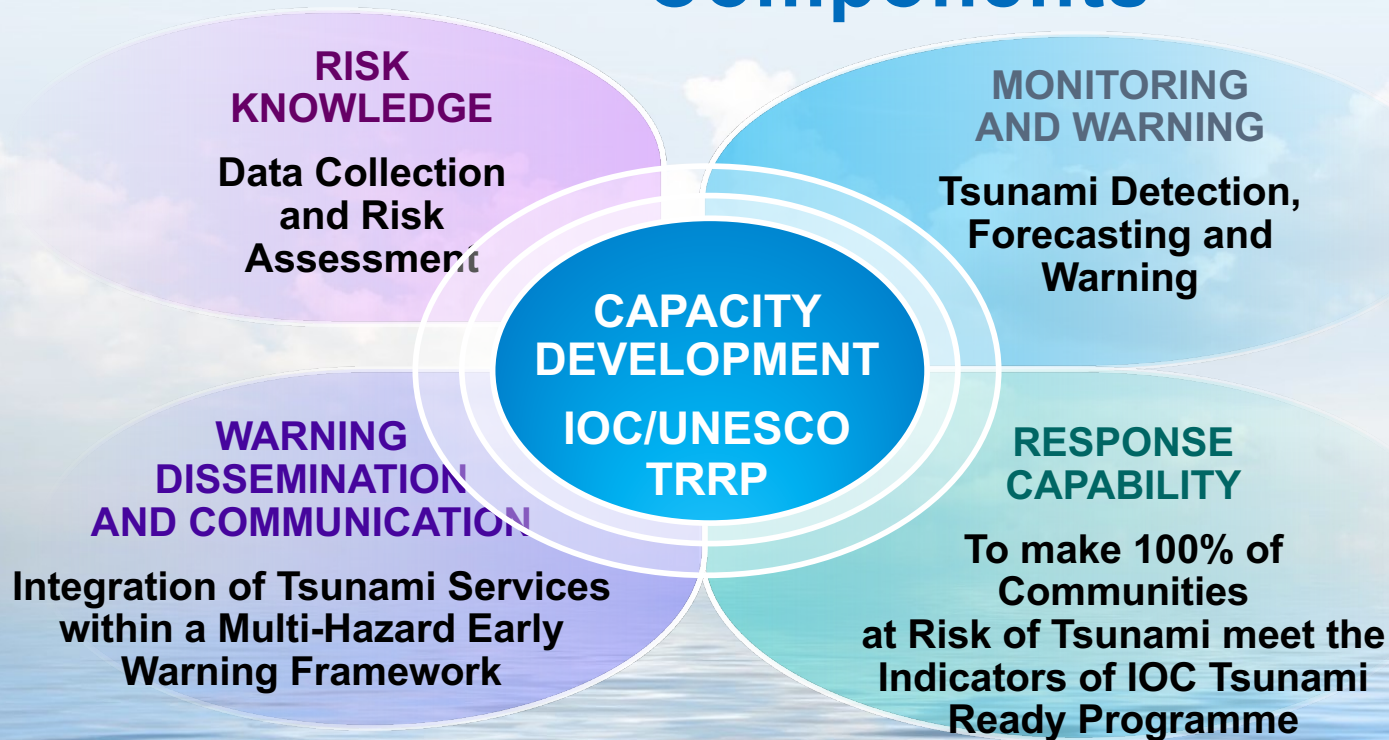
2. Monitoring and Warning

- (i) More quickly detect and measure tsunamis directly, through ocean observations to include instrumentation of undersea cables



UN OCEAN DECADE TSUNAMI PROGRAMME

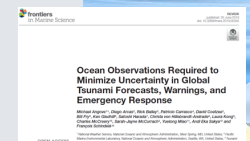
Components



Annex 1 to IOC Circular letter, 2825 “Protecting Communities from the World’s Most Dangerous Waves: A Framework for Action under the UN Decade of Ocean Science for Sustainable Development” (6 January 2021)

Angove M et al (2019)

Ocean Observations Required to Minimize Uncertainty in Global Tsunami Forecasts, Warnings, and Emergency Response.
Front. Mar. Sci. 6:350. doi: 10.3389/fmars.2019.00350





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

1. Real-time impact forecasts

with

2. Deep community preparedness

Tsunami disaster impacts are minimized, enabling rapid restoration of critical infrastructure and services

RESILIENCE!

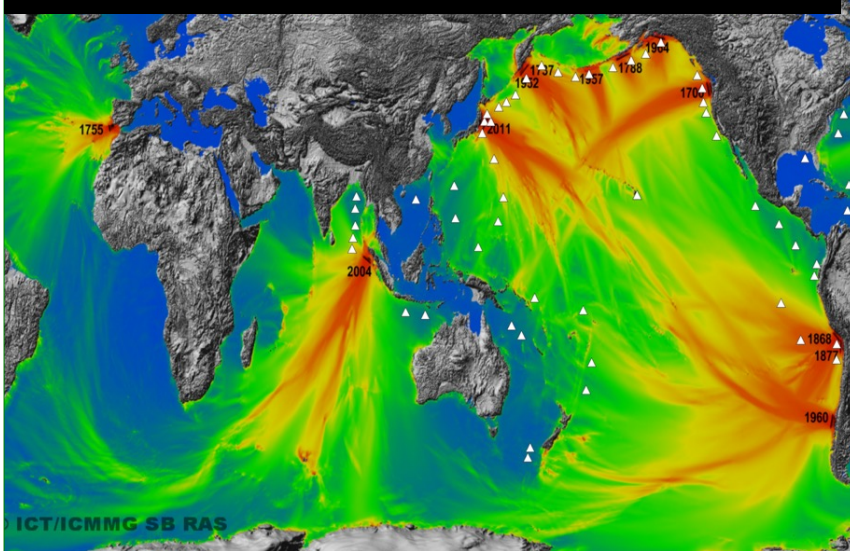
Communities respond to tsunami threats by combining accurate

Comprehensive institutional & community preparedness and capacity building efforts aimed at achieving **IOC Tsunami Ready** designation across all socio-economic categories

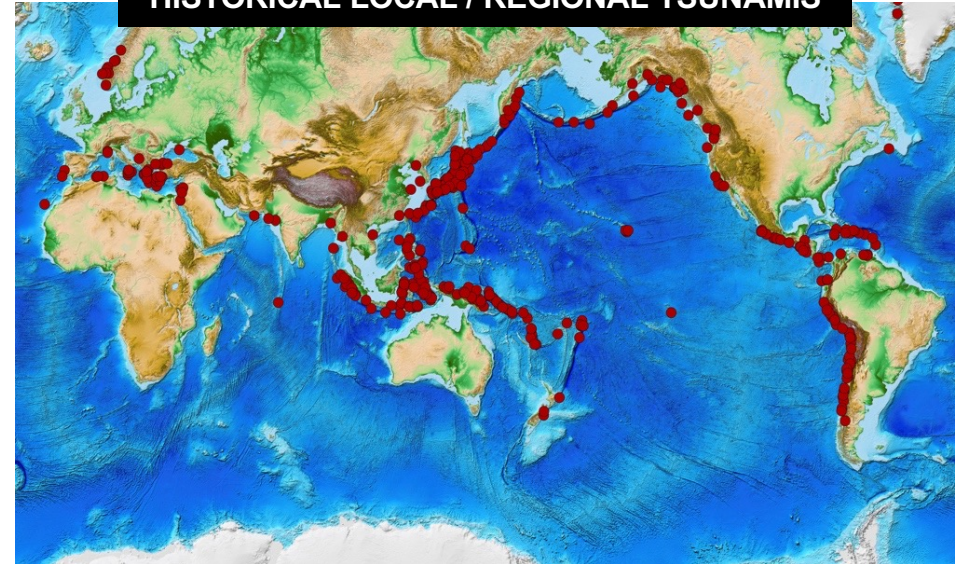


DEADLY TSUNAMIS – DISTANT to LOCAL

HISTORICAL TRANS-OCEANIC DISTANT TSUNAMIS



HISTORICAL LOCAL / REGIONAL TSUNAMIS

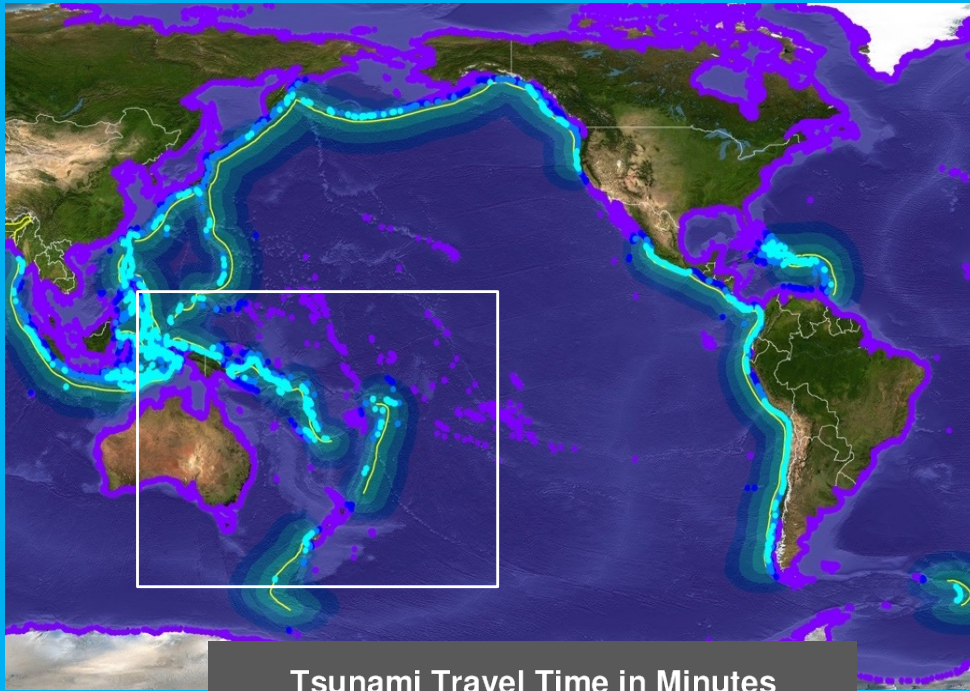


- ❑ Most tsunamis are local (< 1 hr) or regional (1-3 hrs)
- ❑ Globally, 90% of deaths from local or regional tsunamis (Pacific, 99% of deaths)

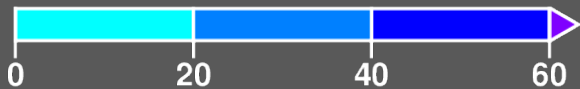


EARLY WARNING FOR LOCAL TSUNAMIS

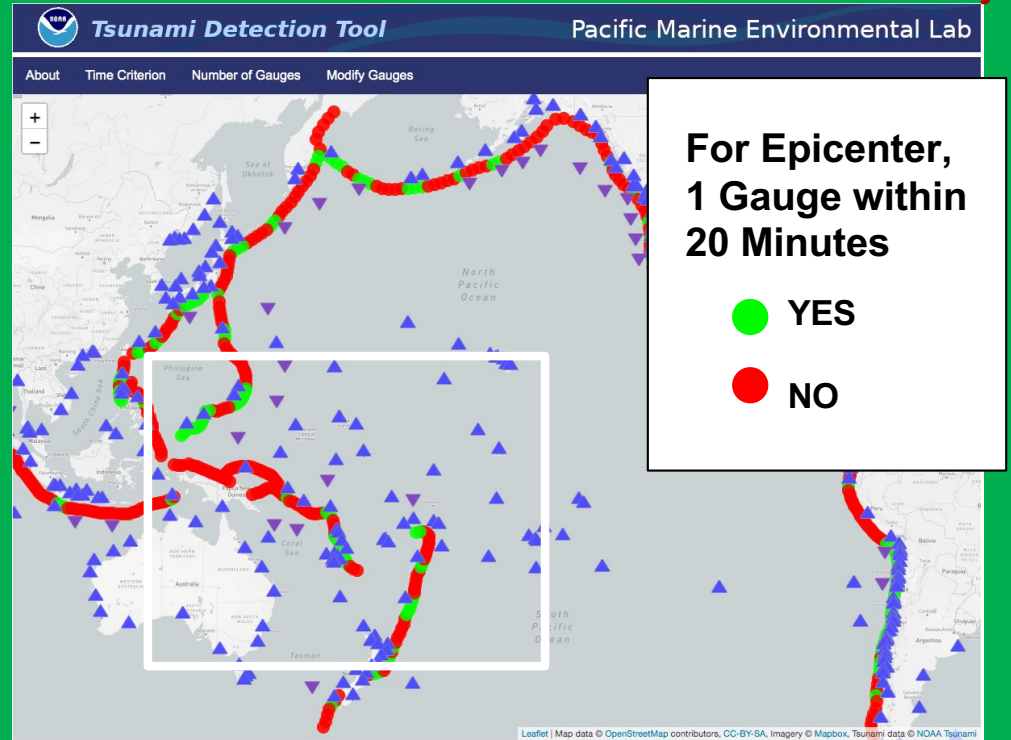
How much time until wave arrives? < 20 min



Tsunami Travel Time in Minutes



Coastal / DART Detection Latency



For Epicenter,
1 Gauge within
20 Minutes

- YES
- NO

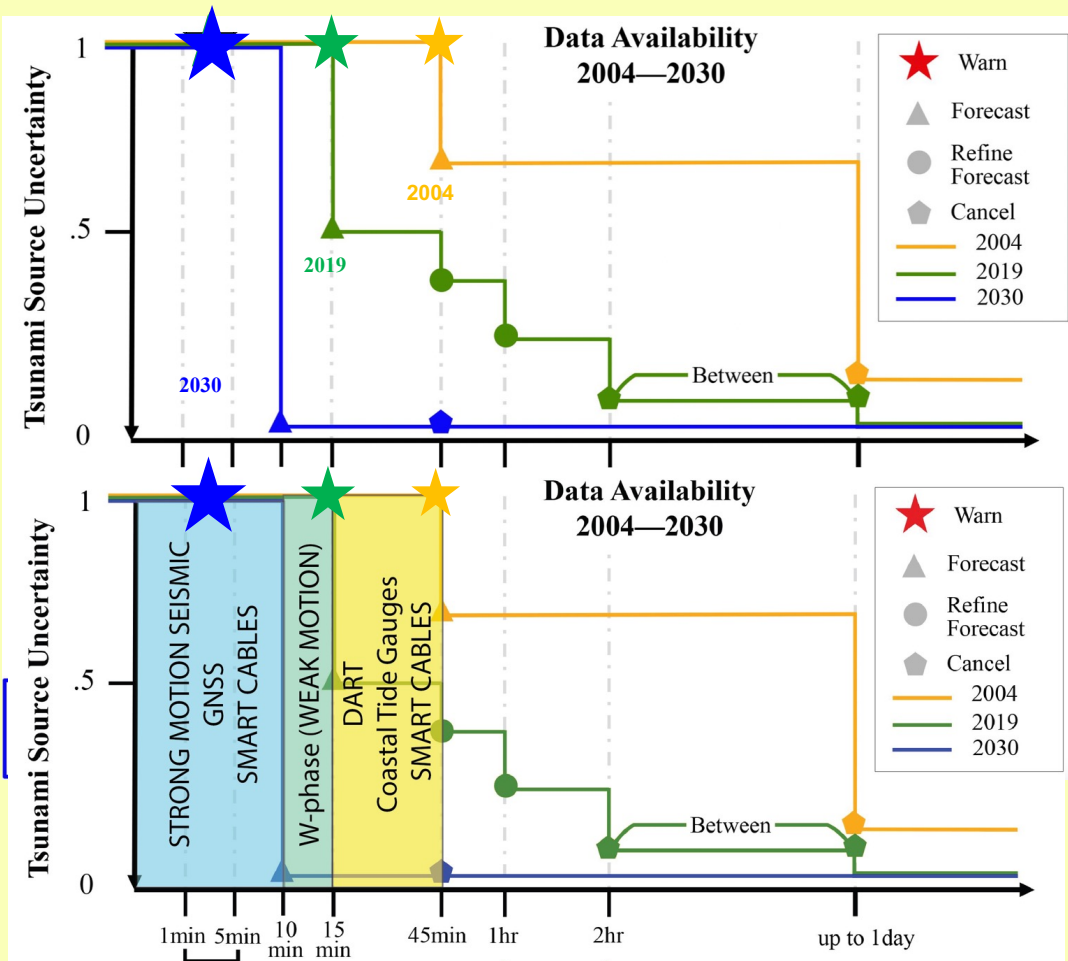
How fast you find out if wave is severe? < 20 min



IMPROVEMENT IN EARLY WARNING (SMART, GNSS)



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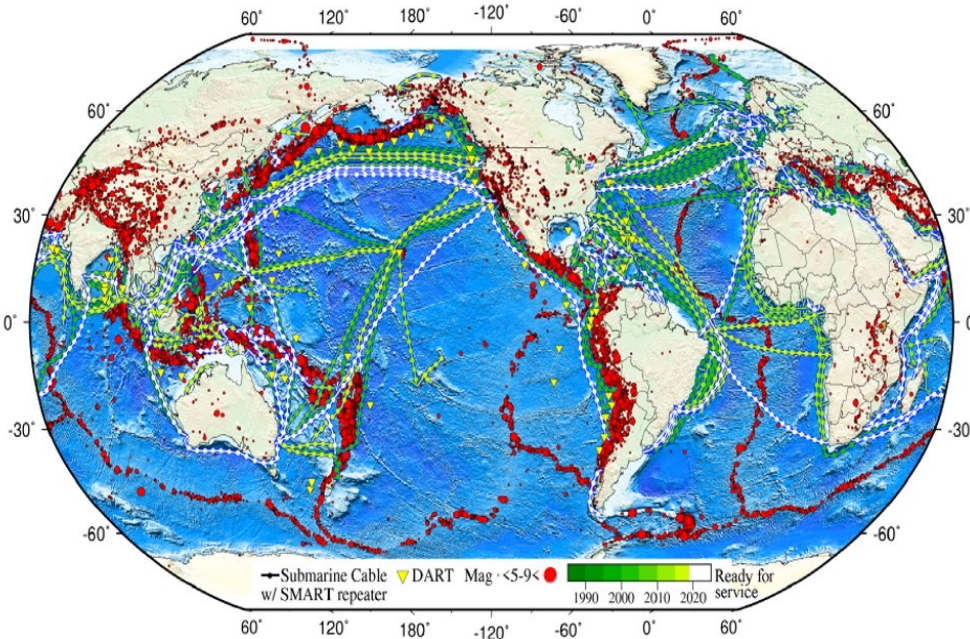


FASTER, BETTER EARTHQUAKE SOURCE CHARACTERIZATION FASTER TSUNAMI DETECTION / REAL-TIME MONITORING: UNDERSEA SMART CABLES, GNSS NETWORK

Historical seismicity (red), DART tsunami buoys (yellow triangles)

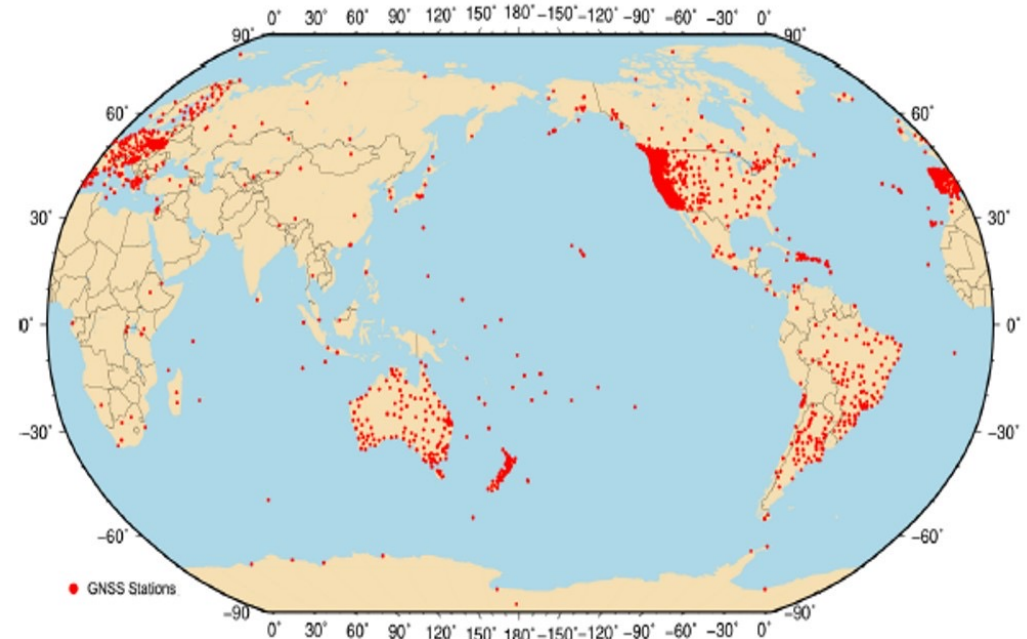
Current / planned (green/white) submarine cables

SMART repeaters shown every 300 km



Angove, M. et. al, 2019

Real-time GNSS stations (public networks, n=2,260)



Pacific Northwest Geodetic
Array/Central Washington University



OCEAN DECADE TSUNAMI PROGRAMME

A SAFE OCEAN

THE MAIN SOCIETAL OUTCOME

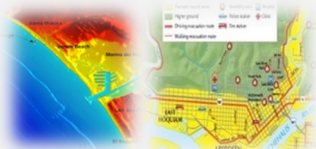
TO MAKE
100%

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

BY
2030

- **Tsunami Coalition:** collaborative with critical UN stakeholders, civil protection, others ==> Raise profile. Facilitate resourcing
- **Capacity Development:** augmented through IOC Ocean Teacher Global Academy (OTGA) ==> Global reach, deep curricula

UN OCEAN DECADE TSUNAMI PROGRAMME: 100% AT-RISK COMMUNITIES TSUNAMI READY



UNESCO IOC TSUNAMI READY INDICATORS

I ASSESSMENT (ASSESS)	
1	ASSESS-1. Tsunami hazard zones are mapped and designated
2	ASSESS-2. The number of people at risk in the tsunami hazard zone is estimated
3	ASSESS-3. Economic, infrastructural, political, and social resources are identified
II PREPAREDNESS (PREP)	
4	PREP-1. Easily understood tsunami evacuation maps are approved
5	PREP-2. Tsunami information is publicly displayed
6	PREP-2. Outreach and public awareness and education resources are available and distributed
7	PREP-3. Outreach or educational activities are held at least three times a year
8	PREP-4. A community tsunami exercise is conducted at least every two years
III RESPONSE (RESP)	
9	RESP-1. A community tsunami emergency response plan (ERP) is approved
10	RESP-2. The capacity to manage emergency response operations during a tsunami is in place
11	RESP-3. Redundant and reliable means to timely receive 24-hour official tsunami alerts are in place
12	RESP-4. Redundant and reliable means to timely disseminate 24-hour official tsunami alerts to the public are in place

- ❑ **STRATEGY:**
Be Aware, Be Prepared
- ❑ **FRAMEWORK:**
 - Harmonized global guidelines UNESCO IOC Tsunami Ready
 - Performance-based Community Recognition
- ❑ **ACTION:**
National programs empower Communities
- ❑ **GLOBAL MEASURE**