UNESCO/IOC – NOAA ITIC Training Program in Hawaii (ITP-TEWS Chile)
TSUNAMI EARLY WARNING SYSTEMS
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19-30 August 2024, Valparaiso, Chile

UN Ocean Decade Tsunami Programme

Goals

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

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Ocean Decade
The science we need for the ocean we want

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

Proclaimed in 2017 by the United Nations General Assembly, the UN Decade of Ocean Science for Sustainable Development (2021-2030) ('the Ocean Decade') **seeks to stimulate ocean science and knowledge generation to reverse the decline of the state of the ocean system and catalyse new opportunities for sustainable development of this massive marine ecosystem**.

The vision of the Ocean Decade is **'the science we need for the ocean we want**'.

The Ocean Decade **provides a convening framework for scientists and stakeholders** from diverse sectors **to develop the scientific knowledge and the partnerships needed to accelerate and harness advances in ocean science to achieve a better understanding of the ocean system**, and deliver science-based solutions to achieve the 2030 Agenda.

The UN General Assembly mandated UNESCO's Intergovernmental Oceanographic Commission (IOC) to coordinate the preparations and implementation of the Decade.

Ocean Decade

The 7 Ocean Decade Outcomes describe the Ocean We Want

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

A clean ocean

where sources of pollution are identified and reduced or removed.

A healthy and resilient ocean

where marine ecosystems are understood, protected, restored and managed.

A productive ocean

supporting sustainable food supply and a sustainable ocean economy.

A predicted ocean

where society understands and can respond to changing ocean conditions.

A safe ocean

where life and livelihoods are protected from ocean-related hazards.

An accessible ocean

with open and equitable access to data, information and technology and innovation.

An inspiring and engaging ocean

where society understands and values the ocean in relation to human wellbeing and sustainable development.

Ocean Decade-Challenges

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1-Understand and beat marine pollution
2-Protect and restore ecosystems and biodiversity
3-Sustainably feed the global population
4-Develop a sustainable and equitable ocean economy
5-Unlock ocean-based solutions to climate change
6-Increase community resilience to ocean hazards
7-Expand the Global Ocean Observing System
8-Create a digital representation of the ocean
9-Skills, knowledge and technology for all
10-Change humanity's relationship with the ocean

https://www.youtube.com/watch?v=jHZXutCxxDA

Ocean Decade Tsunami Programme (ODTP)

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

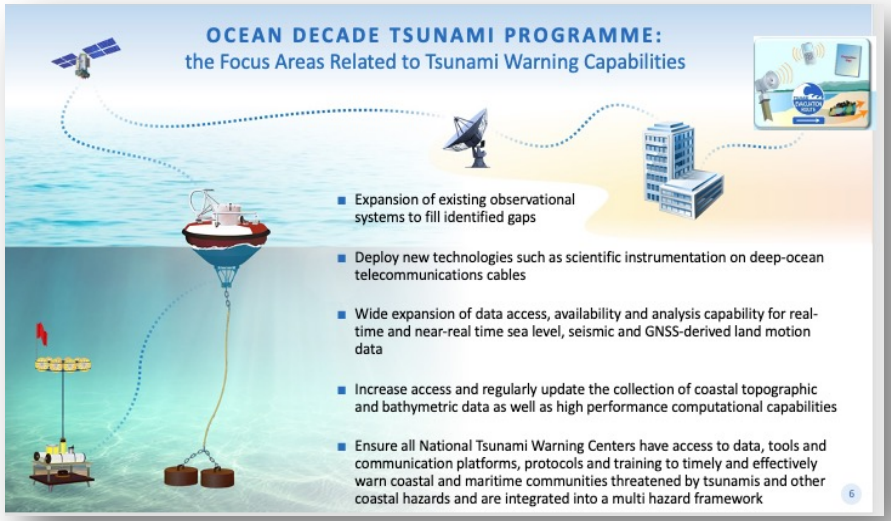
- UN Ocean Decade (2021-30): Once-in-a-generation opportunity to achieve “transformational gains” in tsunami warning and mitigation system by addressing gaps in tsunami warning and enhancing community preparedness.
- IOC Assembly 31 in June 2021 (Dec. A-31/3.4.1) established the “Ocean Decade Tsunami Programme” and “Scientific Committee” to Develop Research, Development & Implementation Plan
  - Technological & Observational Advances to reduce uncertainties in tsunami warning
  - 100 % at risk communities prepared & resilient to tsunamis by 2030 (Tsunami Ready, etc.)

Ocean Decade Tsunami Programme (ODTP)

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

1. To develop the warning systems' capability to issue actionable and timely tsunami warnings for tsunamis from all identified sources to 100% of coasts at risk

2. 100% of communities at risk be prepared and resilient to tsunamis by 2030 through programmes like the IOC-UNESCO Tsunami Ready Recognition Programme (TRRP)



The SC-ODTP developed the draft 10-Year Research, Development and Implementation Plan for the Ocean Decade Tsunami Programme which was presented and endorsed at the IOC Assembly in June 2023.

Key Elements of the ODTP

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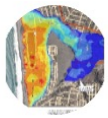

1. Tsunami Risk Knowledge: Identify and prioritise at-risk communities

2. Tsunami Detection, Analysis and Forecasting: Expand existing, and deploy new observing technologies and warning systems

3. Warning, Dissemination and Communication: Access to data, tools, communication platforms, protocols and training to effectively warn coastal and maritime communities

4. Preparedness and Response Capabilities: To build tsunami-resilient communities

5. Capacity Development, SIDS and LDCs, Multi-hazard Framework: Underpinning elements

6. Governance and Pathways to Implementation

1. Tsunami Risk Knowledge

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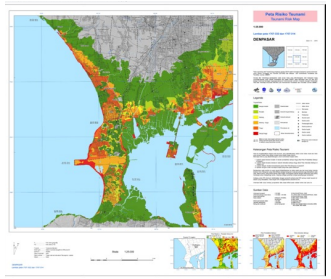
Definition of inundation areas, flow depths and arrival times through Tsunami Hazard Assessments

- Catalogue of historical tsunami records
- Database of tsunami source scenarios
- Coastal digital elevation data
- Access to Tsunami numerical models
- At least one person able to do tsunami modelling
- Defined the inundation area for the chosen community

Definition of vulnerability and exposure

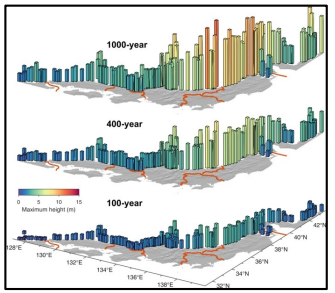
- Identified critical infrastructure at risk
- Identified vulnerable groups
- Identified number of population
- Identified economic assets
- Identified built & natural environment



Definition of methodology to calculate risk

Definition of capacity to respond

- Bridged the gaps on legal framework
- Bridged the gaps on institutional framework
- Bridged the gaps on EWS



Using results from Tsunami Risk Assessments

- Performed TRA studies
- Developed tsunami risk reduction tools

2. Tsunami Detection, Analysis And Forecasting

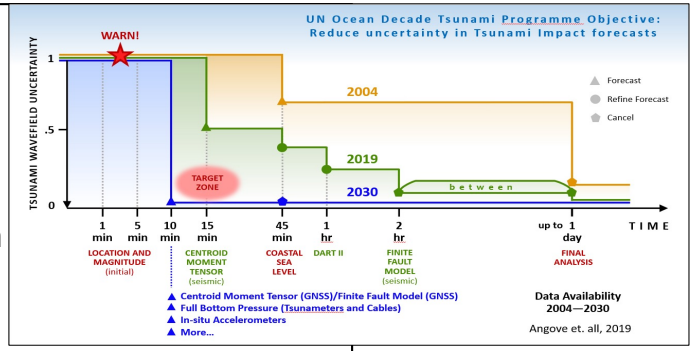
- Greatly expand international cooperation in tsunami warning and mitigation, to improve capability to directly detect and measure tsunamis and reduce reliance on seismic proxy relationships in terms of projecting impacts
- To develop the warning systems' capability to issue actionable and timely tsunami warnings for tsunamis from all identified sources to 100% of coasts at risk
- Most urgently, the ODTP will aim to provide tsunami confirmation within 10 minutes or less of origin for the most at-risk coastlines

Detection and Measurement

- Maximize and expand current capabilities
- Implementation of existing capabilities not being applied to tsunami ops.
- Identification of new candidate capabilities

Characterization and Forecasting

- Research on nature of tsunamis, source mechanisms and characterisation
- Probabilistic Tsunami Forecasting Techniques
- New Forecast methods
- Optimal notional global network design and implementation in all ICGs
- Enhanced data sharing in all ICGs
- High-Resolution Coastal Bathymetry and Topography
- Computing/modelling/impact forecasting/assimilation/analytics in all TSPs
- Access to data, tools and communication platforms in all TWCs

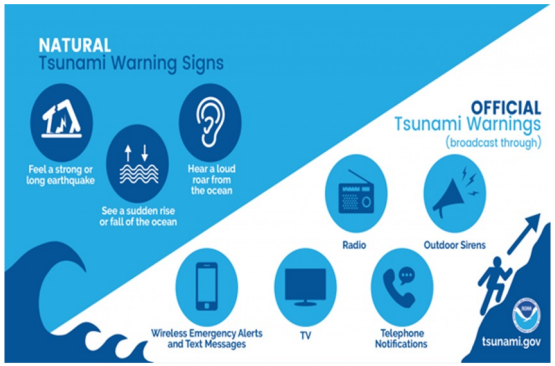


3. Tsunami Warning, Dissemination and Communication

The ODTP goal is that by 2030 there will be significant improvements in the national decision making to warn, and mechanisms in place for the effective and inclusive construction, dissemination and communication of warnings.

100% of the national authorities will be able to effectively warn communities and population at risk.

Communities at risk will be able to use these advances to improve local tsunami preparedness and response capabilities and become Tsunami Ready



Key elements that need to be addressed

Effective decision making to warn - National/local tsunami warning chains and standard operating procedures; Decision Support Tools (Co-design, Competency Development)

Effective construction of warnings – Time constraints, Inclusive, Actionable content (Use of IT, understand target audience, impact-based warning content)

Effective dissemination and communication of warnings – Institutional capacity, Communication mechanisms, Multi-Hazard Warning Systems, Multiple sources of information (Standards & Formats, CAP, Broadcast & Social Media)

4. Preparedness and Response Capabilities

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

Aspirational social outcome of the Ocean Decade Tsunami Programme is that 100% of communities at risk from tsunamis are prepared for and resilient to tsunamis by 2030 through efforts like the IOC-UNESCO Tsunami Ready Recognition Programme

Key elements to be addressed

- **Risk Perception and Awareness** – Risk perception studies need to be encouraged across all regions
- **Preparedness**
  - All at-risk communities have tsunami hazard, inundation, evacuation maps, TEMPP trainings
  - Public display of tsunami information, Tsunami Signage
  - Locally relevant education and awareness resources, institutionalizing tsunami education
  - promote communities to actively participate in the World Tsunami Awareness Day
  - 100% of communities at risk conduct a local tsunami exercise every two years
- **Response Capability**
  - All countries with tsunami risk should have agreed parameters at the national and local level for warning and have approved response plans
  - 100% of at-risk communities have multiple effective and sustainable communication methods in place
  - Inclusive, inventory of resources, natural signs and self-evacuation, multihazard, capacity building
- **Mitigation**
  - Communities have access to an inventory of best practices of plans and structural and nature-based solutions
  - More communities have implemented plans and measures to minimize impacts to critical infrastructure and marine assets from tsunamis and other coastal hazards,
  - Mainstreaming disaster risk reduction into urban planning

5. Capacity Development

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Ensure investment in capacity development for the different stakeholders including the generators and the users of the tsunami early warning system

- National, regional and local level initiatives to reach the objective of 100% at-risk communities to be prepared and resilient to tsunami
- Facilitate equitable access to data, information, knowledge, technology, and infrastructure, leaving no-one behind
- Special consideration to be capacity requirements of SIDS and LDCs

6. Governance and Pathways to Implementation

The ODTP provides a framework for identifying gaps, suggesting solutions, prioritise resources, and implementing actions within the timeframe of the Ocean Decade

This plan outlines the pathways for achieving overall objectives of ODTP including challenges, solutions, performance indicators, milestones and target dates for the four main components of the tsunami early warning system

Considering the nature of tsunami hazard, the optimal solutions should have a global design, address regional imperatives, and be implemented through contributions and actions of Member States and other stakeholders

Scientific objectives of the tsunami warning enhancements will be achieved by maximizing and expanding current capabilities, identifying capabilities that exist but are not currently applied to tsunami, and developing new capabilities through innovation and research

Member States should endeavour to dovetail their national tsunami warning system plans/programmes with the ODTP objectives

Member states, academic institutions and industries will seek, possibly through ICG consultation to identify candidate proposals aimed at addressing the solutions

R&D community and Industry has the opportunity to develop and contribute to scientific understanding, technological solutions, product development and capacity building.

The intent of the plan is to offer contribution pathways that cover the full spectrum or financial commitment by targeting the objectives most important to advancing Member State capabilities

Tsunami Ready Recognition Programme

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

ODTP

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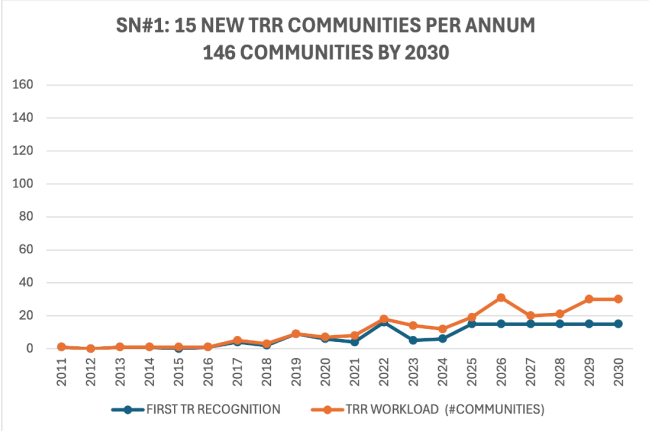

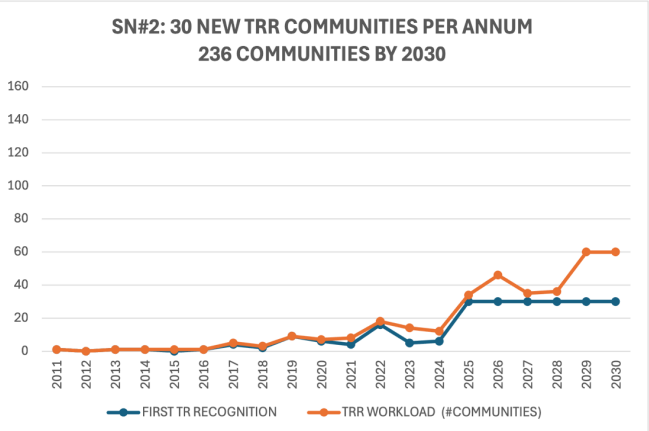

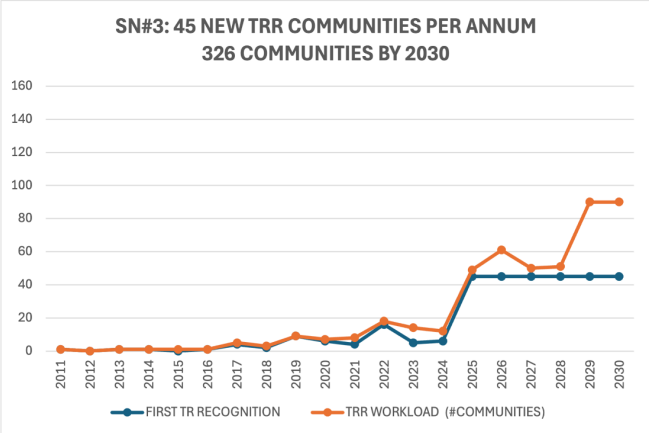

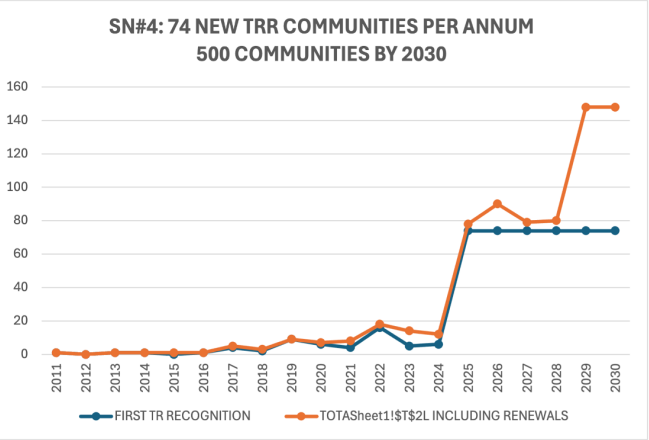

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Thank You

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SMART CABLES
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