

**UNESCO-IOC Meeting of Experts on tsunami sources and
hazard in southern Peru and northern Chile
22-25 August 2023 -Arica, Chile**



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**Intergovernmental
Oceanographic
Commission**

**B. Aliaga
IOC Tsunami Resilience
Section**

**Overview:
meeting aims, objectives,
IOC requirements and
expectations
role of UNESCO/IOC and
ICG-PTWS**

We have gone a long way...

ITSU renamed

September 2005, Vina del Mar, Chile
The 20th Session of the ICG/PTWS-XX decides to change its name to the Intergovernmental Coordination Group for the Pacific Tsunami Warning and Mitigation System

ITSU development

2005

3 ICGs established

Indian Ocean (ICG/IOTWS), Caribbean and Adjacent Seas (ICG/CARIBE-EWS), Mediterranean and North Atlantic (ICG/NEAMTWS) (IOC/XXIII-11, 12, 13, **June 2005**)

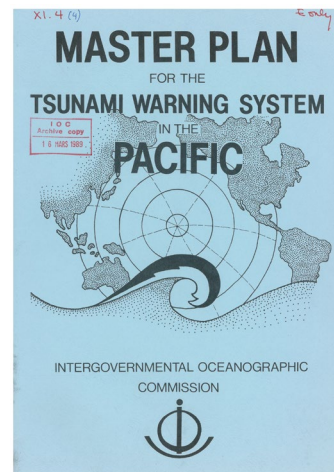
The tragedy brings world attention to the dangers of tsunamis in every nation and initiates the development of warning and mitigation systems in the Indian Ocean

2004

Indian Ocean Tsunami

1989

First Master Plan



1977

The Honolulu Observatory renamed Pacific Tsunami Warning Center PTWC

ITSU

IOC/IV-6, International Aspects of the Tsunami Warning System in the Pacific, Paris, November 1965

1965

1948 the Honolulu Magnetic Observatory, under the US Coast and Geodetic Survey (USCGS) established

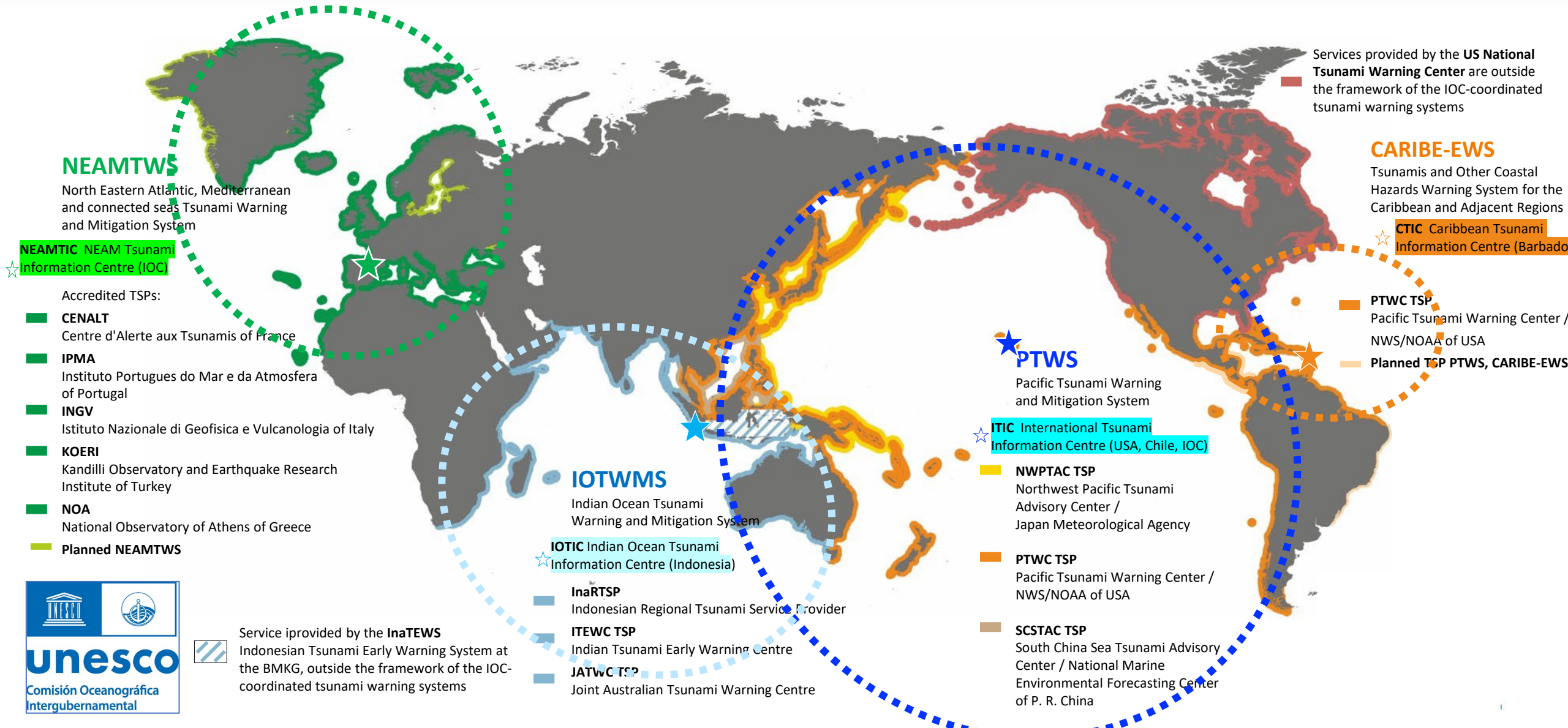
1952. The Japan Meteorological Agency started its national tsunami warning center

1965 - IOC Working Group on the International Aspects of the Tsunami Warning System in the Pacific, organized by the USCGS on behalf of the IOC, Honolulu, 27-30 April 1965

GLOBAL TSUNAMI WARNING AND MITIGATION SYSTEM

Intergovernmental Oceanographic Commission of UNESCO

2023 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 (Barbados)

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

IOC ICG/PTWS STRUCTURE - WORKING GROUPS AND TASK TEAMS 2021-2023



Remaining challenges...and the way forward



Minamisoma, Fukushima prefecture, Japan. 2011 March 11, Mw 9.0, Honshu, Japan earthquake and tsunami. (Credit: AFP/AFP/Getty Images.)

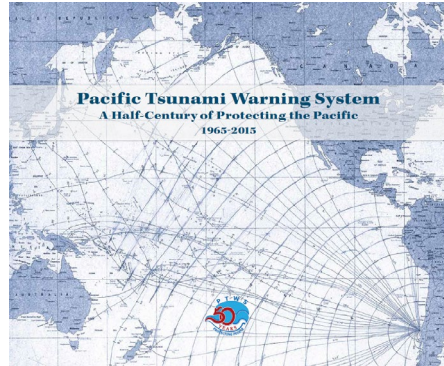
2011 Tōhoku earthquake and tsunami

2011

Inter-ICG Task Team on Hazard Assessment Related to Highest Potential Tsunami Source Areas



2016 ->Recent case studies demonstrated complexity and variability, as well as importance of other types of tsunami sources and that earthquake generated Tsunamis can happen in any subduction zones.



50th anniversary of TSU/PWTS

2015



2018

Palu, Indonesia

Landslide generated tsunami



December 18, 2018 December 30, 2018



Volcano generated tsunami

Sunda strait, Indonesia

2018



UN Ocean Decade Tsunami Programme

2022

TOWS Task Teams

The Group decided to establish a specific Ad Hoc Team on **Meteo-tsunamis** & Ad Hoc Team on **Tsunamis Generated by Volcanoes**

UN OCEAN DECADE TSUNAMI PROGRAMME

THE MAIN SOCIAL OUTCOME

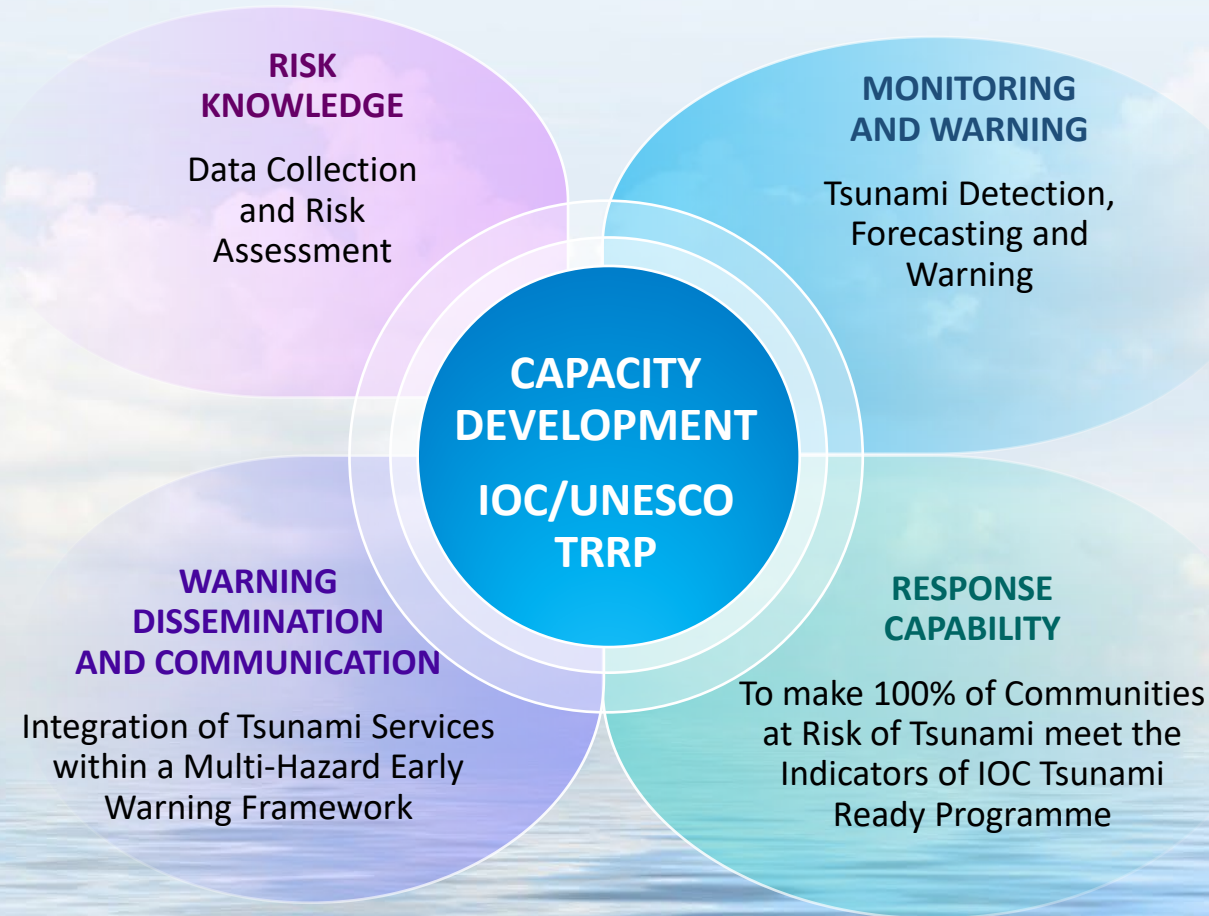
TO MAKE
100%

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

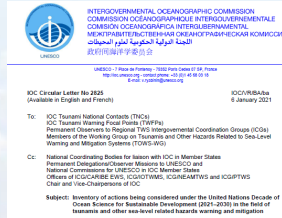
BY
2030

UN OCEAN DECADE TSUNAMI PROGRAMME

Components



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



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)

1. Risk Knowledge

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

2. Monitoring and Warning

- More quickly detect and measure tsunamis directly, through ocean observations to include instrumentation of undersea cables.
- Ensure critical tsunami generation parameters are identified through the optimal use and real-time sharing of new and existing sensors and data.
- Leverage the Nippon Foundation-GEBCO Seabed 2030 hydrographic survey initiative to ensure nearshore coastal zones have complete bathymetric/topographic data coverage at the required resolution.

Northern Hispaniola, 10-11 July 2013

<https://oceanexpert.org/event/1348>

Earthquake and tsunami hazard in Northern Haiti: Historical events and potential sources (Meeting of experts). Paris, UNESCO, 2013, pp.29 (WR-255)

South China Sea – 16-18 November 2015

<https://oceanexpert.org/event/1707>

Scientific meeting of experts for coordinated scenario analysis of future tsunami events and hazard mitigation schemes for the South China Sea region, Xiamen, China, 16–18 November 2015. Paris, UNESCO, 2018, 33 pp (WR-275)

Southern Dominican Republic – 6-7 May 2016

<https://oceanexpert.org/event/1842>

Sources of tsunamis in the Caribbean with possibility to impact the southern coast of the Dominican Republic, Santo Domingo, Dominican Republic, 6–7 May 2016. Paris, UNESCO, 2016, pp.36. English and Spanish. (WR-276)

Central America – 23-24 June 2016

<https://oceanexpert.org/event/1840>

Tsunami Hazard in Central America: Historical Events and Potential Sources. San José, Costa Rica, 23–24 June 2016. Paris, UNESCO, 2018. (WR-278)

Website showing numerical models for scenarios (hosted by NCEI for ICG/CARIBE-EWS) - Caribbean and Adjacent Regions Tsunami Sources and Models

<https://maps.ngdc.noaa.gov/viewers/CATSAM/>

Tonga-Kermadec Trench – 29 October – 2 November 2018, Wellington, NZ

<https://oceanexpert.org/event/2338>

Expert meeting on tsunami sources, hazards, risk and uncertainties associated with the Tonga-Kermadec Subduction Zone. Wellington, New Zealand, 29 October–3 November 2018. Paris, UNESCO 2020 (WR-289).

Lesser Antilles – 18-20 March 2019 (

<https://oceanexpert.org/event/2395>

Experts Meeting on Sources of Tsunamis in the Lesser Antilles. Fort-de-France, Martinique (France), 18–20 March 2019. Paris, UNESCO.2020 (WR-291)

Ecuador-Colombia Border, 27-29 January 2020 (meeting in progress)

<https://oceanexpert.org/event/2548>

Expert Meeting on Tsunami Sources, Hazards, Risk and Uncertainties Associated with the Colombia-Ecuador Subduction Zone. Guayaquil, Ecuador, 27–29 January 2020. Paris, UNESCO, 2021. (WR-295)

Chile-Peru border, 22-25 August 2023

<https://oceanexpert.org/event/3949#overview>



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THANK YOU FOR
ATTENTION!
QUESTIONS?
COMMENTS?