



2021  
2030 United Nations Decade  
of Ocean Science  
for Sustainable Development

# UN Decade of Ocean Science for Sustainable Development IOC Ocean Decade Tsunami Programme - Tsunami Ready



## World Tsunami Awareness Day - 2021

Special Representative of the Secretary-General for  
Disaster Risk Reduction (UNDRR)



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for  
video*



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Intergovernmental  
Oceanographic  
Commission

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World Tsunami Awareness Day - 2021

**Tsunamis are the most deadly of all sudden onset natural hazards**

[Click for video](#)



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# What is UNESCO/IOC Tsunami Ready Recognition Programme?



## 2.2 Programme and its Indicators

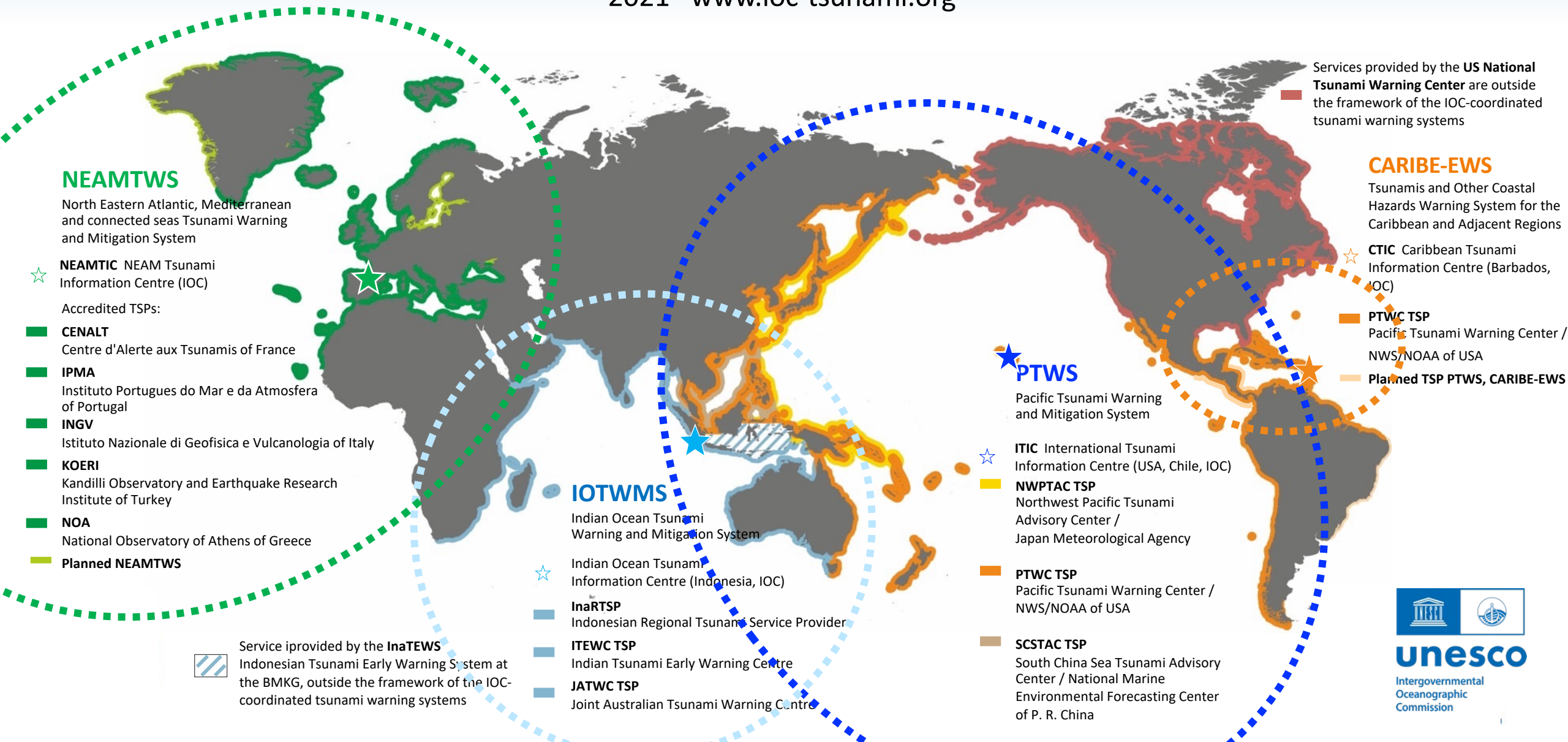
*Dr. Laura Kong*  
*International Tsunami Information Centre (ITIC)*



# GLOBAL TSUNAMI WARNING AND MITIGATION SYSTEMS

Intergovernmental Oceanographic Commission of UNESCO

2021 [www.ioc-tsunami.org](http://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**

## IOTWMS

Indian Ocean Tsunami Warning and Mitigation System

☆ Indian Ocean Tsunami Information Centre (Indonesia, IOC)

- **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

## CARIBE-EWS

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

☆ **CTIC** Caribbean Tsunami Information Centre (Barbados, IOC)

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

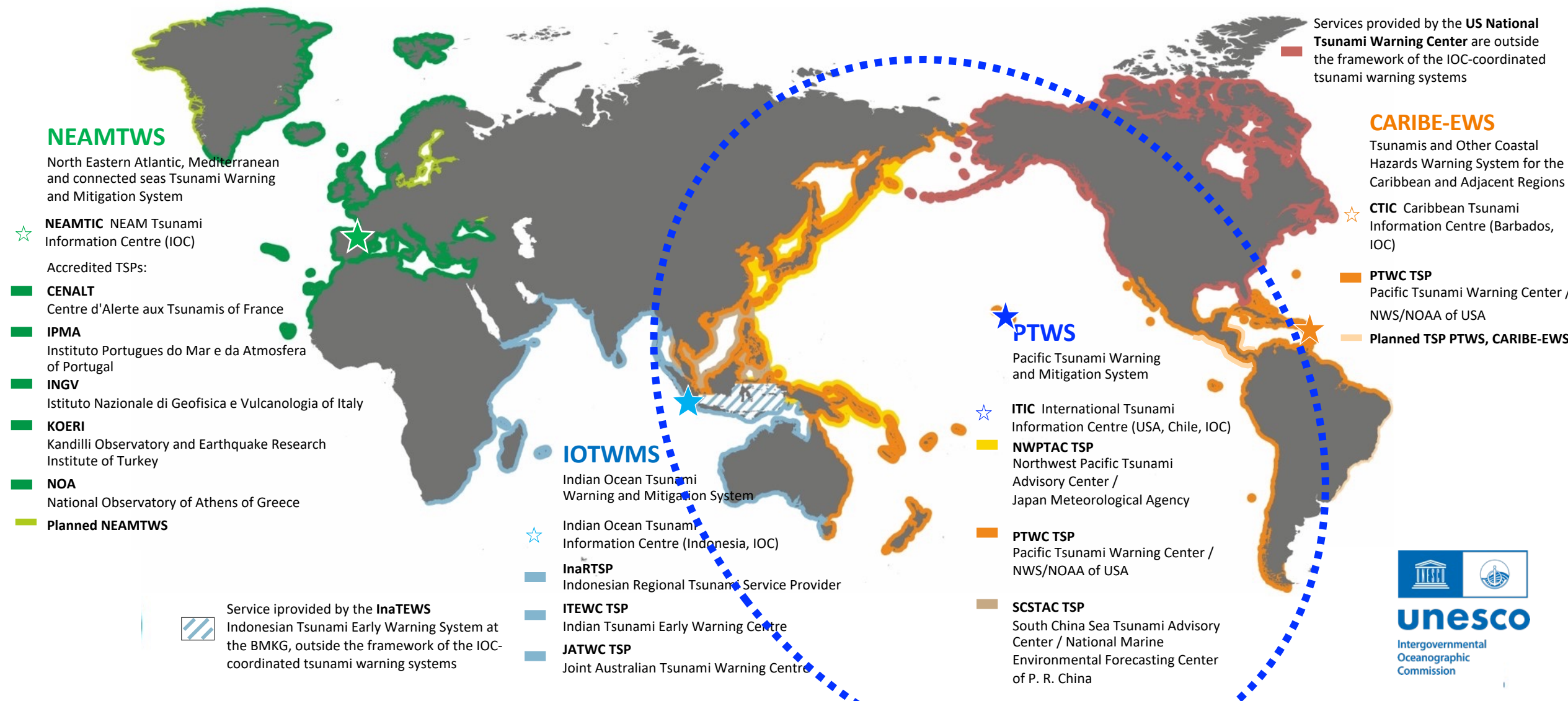


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- **Planned NEAMTWS**

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

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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

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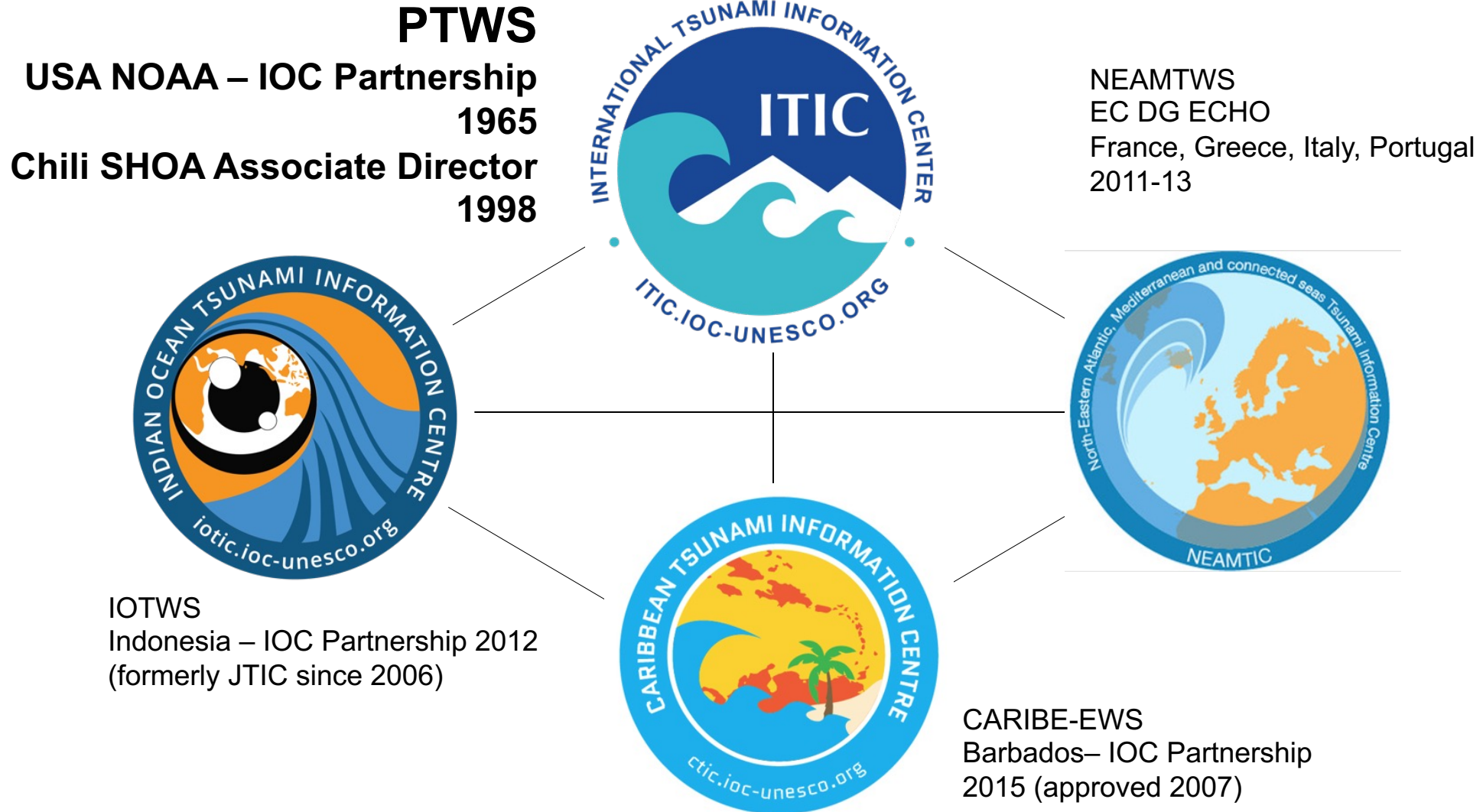
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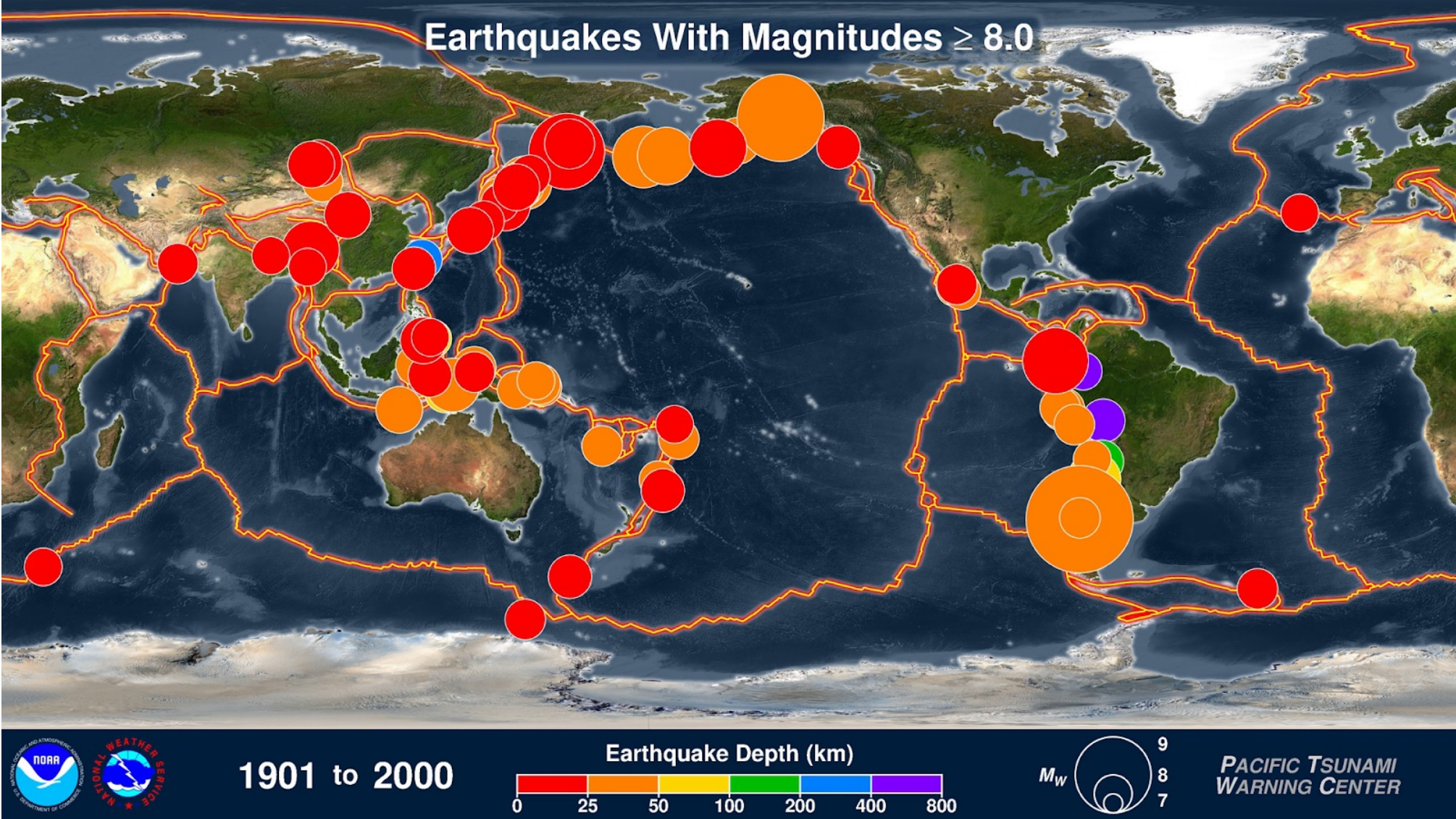
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# IOC Tsunami Information Centers

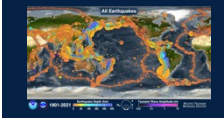




# DANGEROUS EARTHQUAKES - GLOBAL

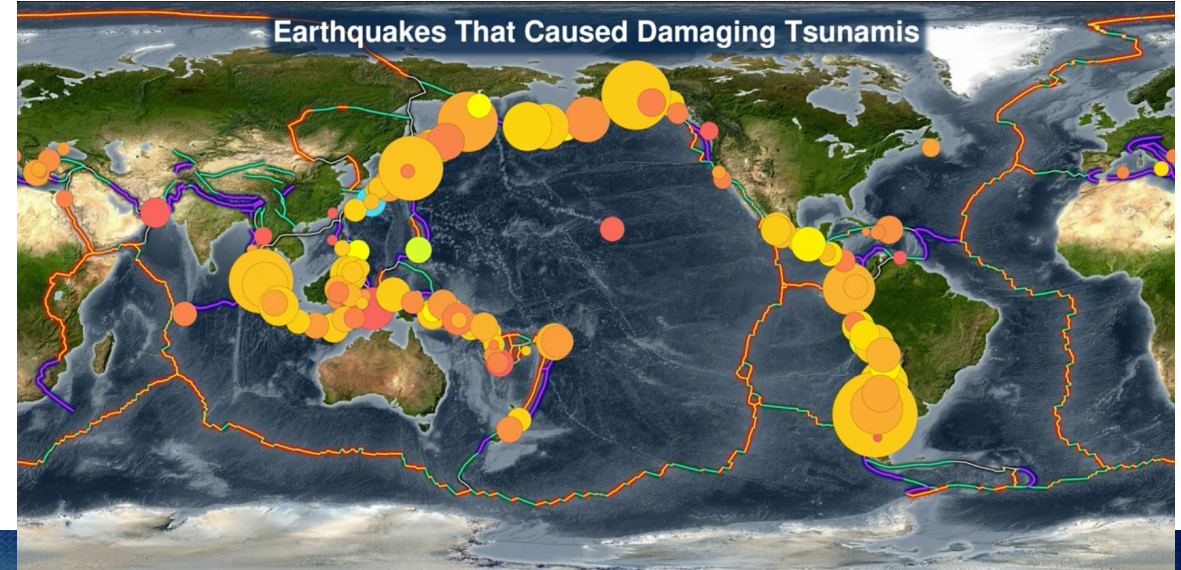
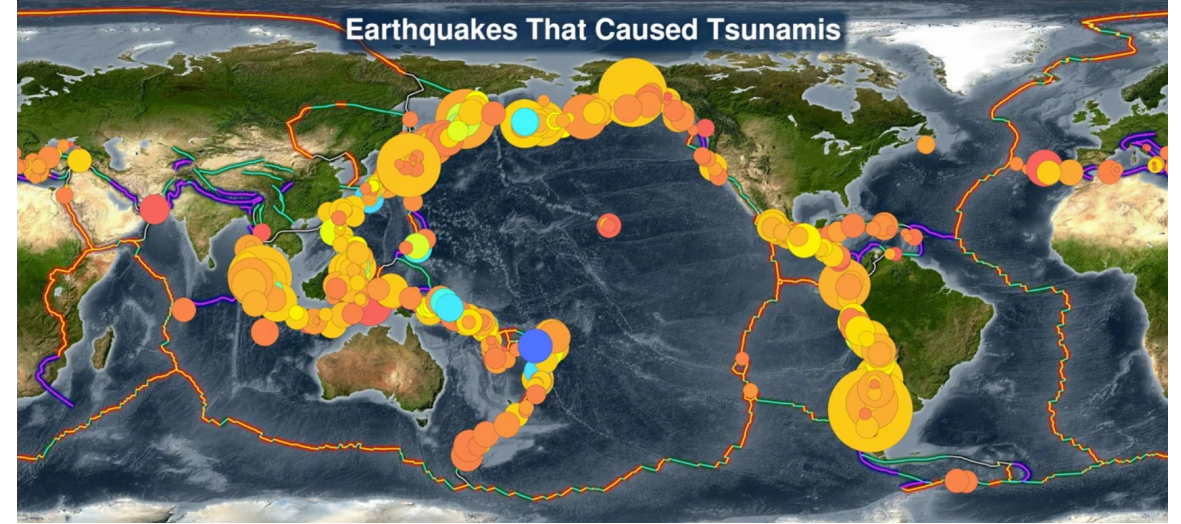
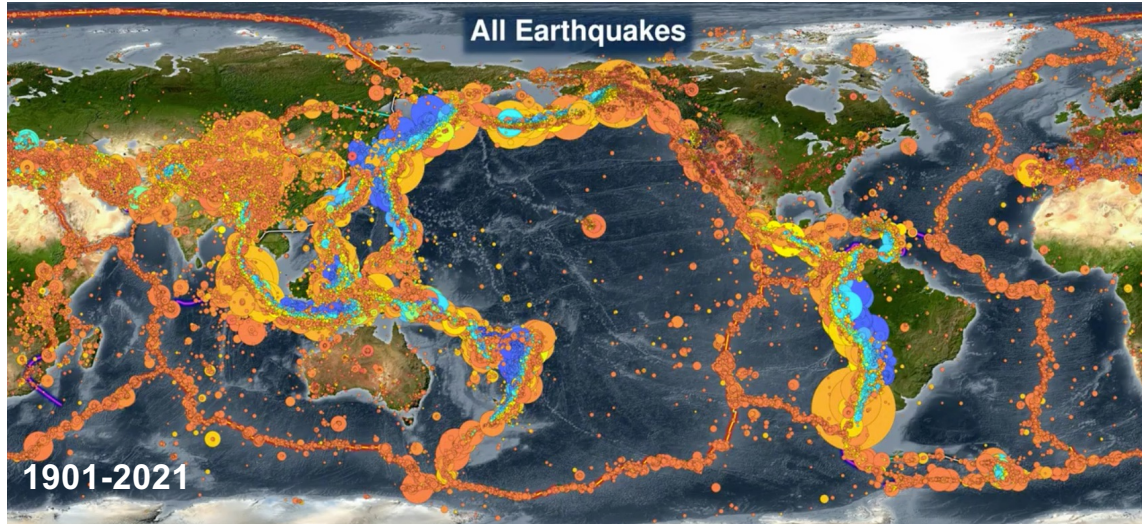


Click below  
for video  
EQ-Tsunami  
1901-2021





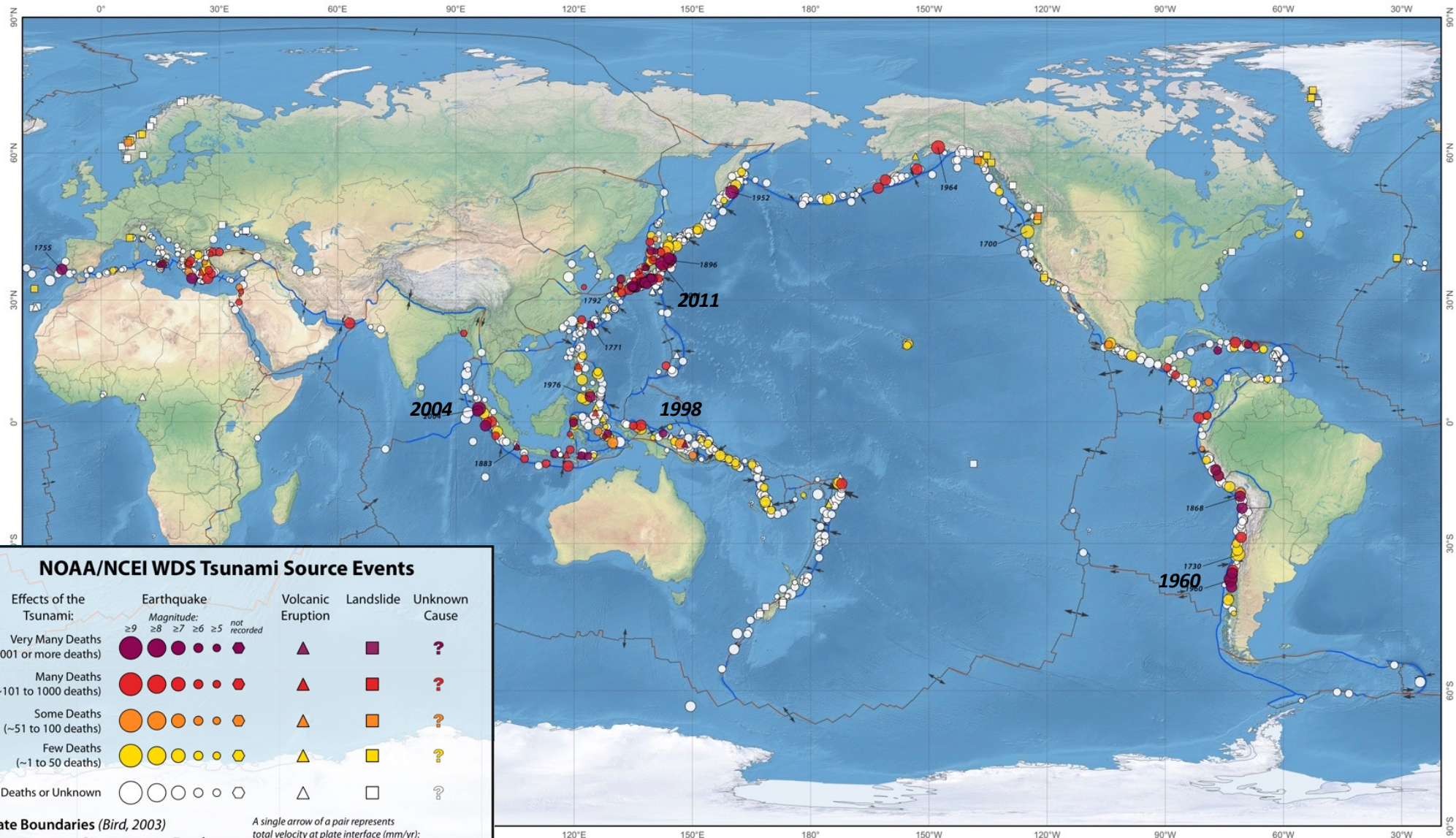
# DANGEROUS EARTHQUAKES & TSUNAMIS



- ❑ 80% caused by earthquakes
- ❑ Shallow, undersea/near coast
- ❑ Magnitude 8+ (M7+)



# DEADLY TSUNAMIS – GLOBAL (1620 B.C to A.D. 2022)



**NOAA/NCEI WDS Tsunami Source Events**

Effects of the Tsunami:	Earthquake	Volcanic Eruption	Landslide	Unknown Cause
Very Many Deaths (~1001 or more deaths)	Magnitude: $\geq 9$ , $\geq 8$ , $\geq 7$ , $\geq 6$ , $\geq 5$ , not recorded	▲	■	?
Many Deaths (~101 to 1000 deaths)		▲	■	?
Some Deaths (~51 to 100 deaths)		▲	■	?
Few Deaths (~1 to 50 deaths)		▲	■	?
No Deaths or Unknown		▲	■	?

**Plate Boundaries (Bird, 2003)**

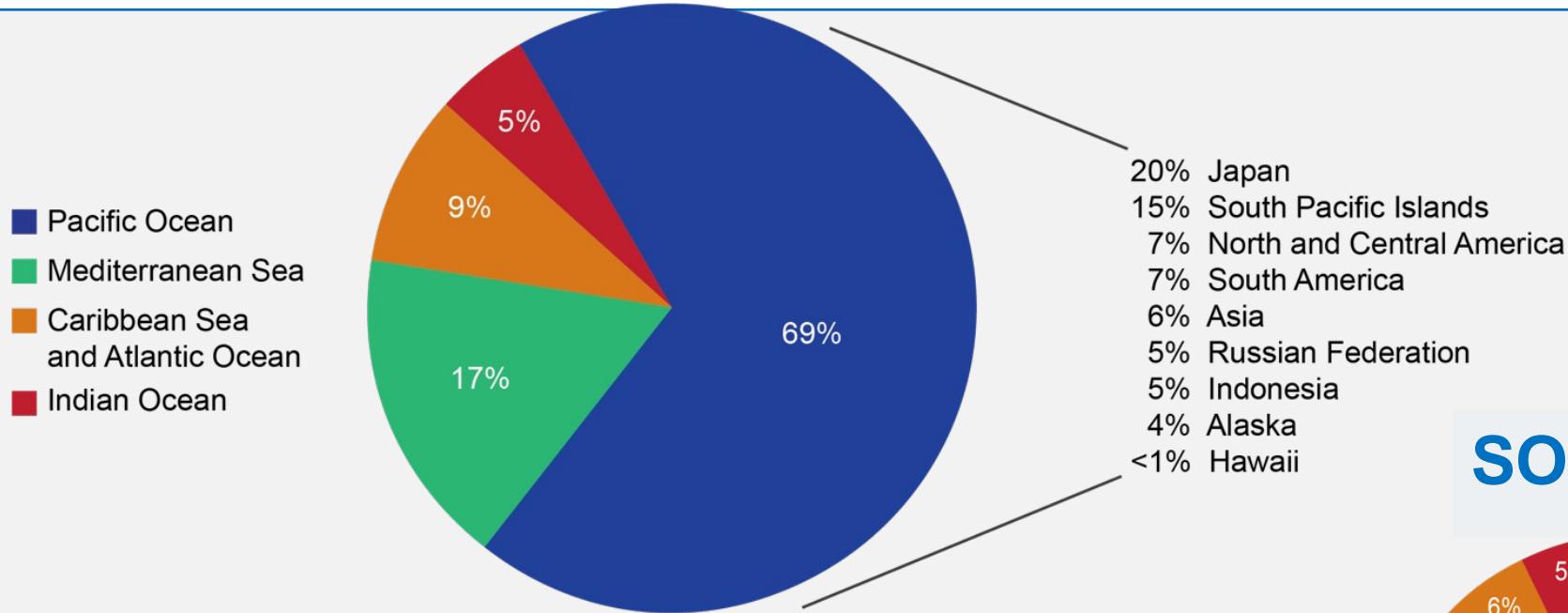
Convergent: Divergent: Transform:

A single arrow of a pair represents total velocity at plate interface (mm/yr): 0-20, 20-40, 40-80, 80-160, 160-230



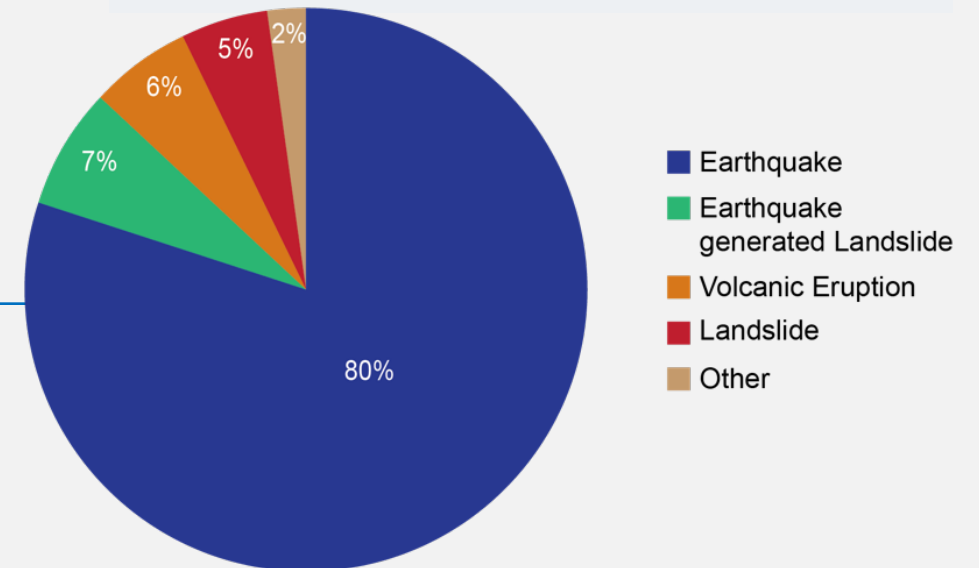
# DEADLY TSUNAMIS – GLOBAL (1620 B.C to A.D. 2022)

## SOURCE LOCATION



- 20% Japan
- 15% South Pacific Islands
- 7% North and Central America
- 7% South America
- 6% Asia
- 5% Russian Federation
- 5% Indonesia
- 4% Alaska
- <1% Hawaii

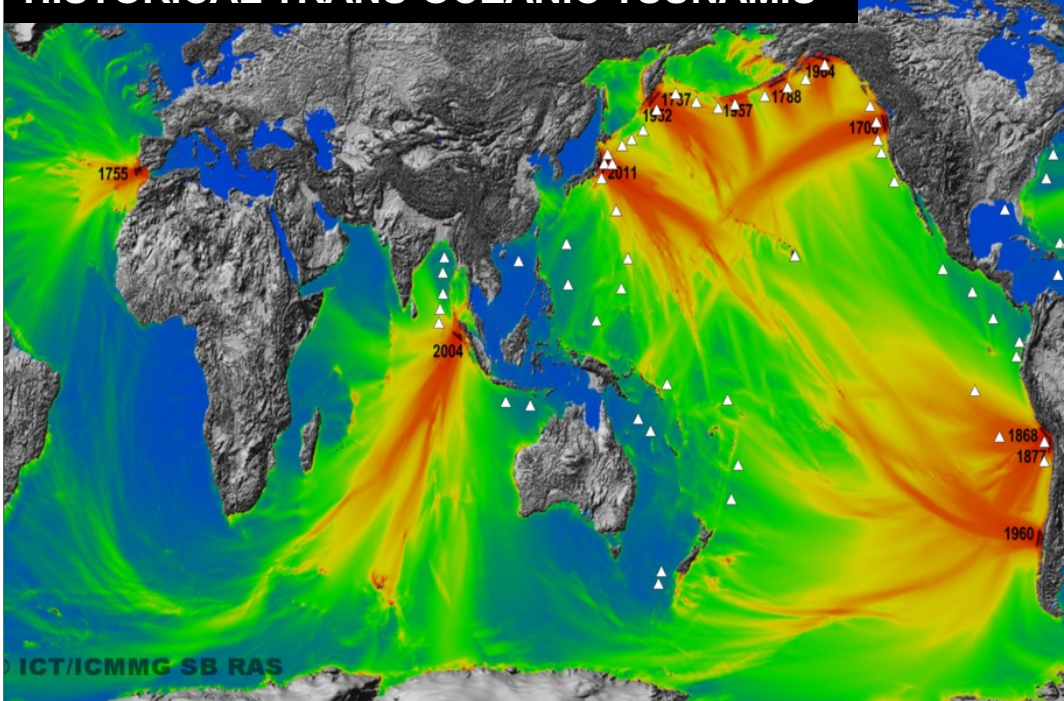
## SOURCE GENERATION



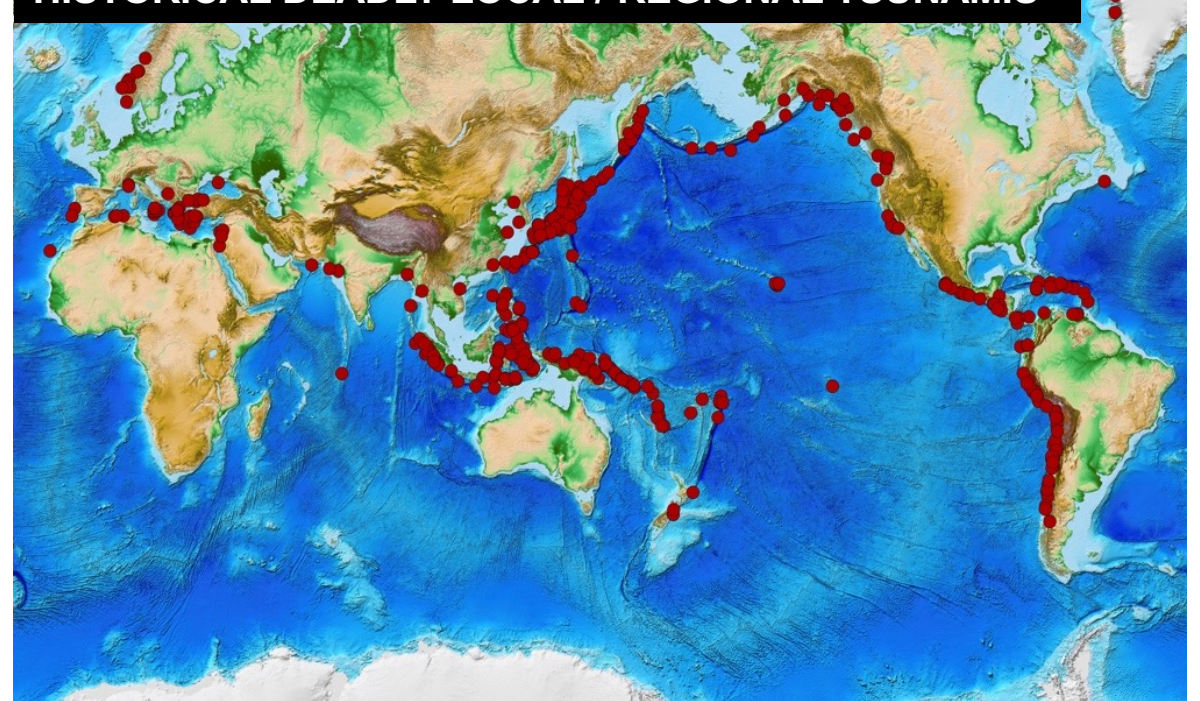


# PACIFIC TSUNAMIS

HISTORICAL TRANS-OCEANIC TSUNAMIS



HISTORICAL DEADLY LOCAL / REGIONAL TSUNAMIS



- ❑ 69% of world's tsunamis in Pacific and marginal seas
- ❑ 99% of deaths in Pacific from Local or Regional Tsunamis (90% globally)



# 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

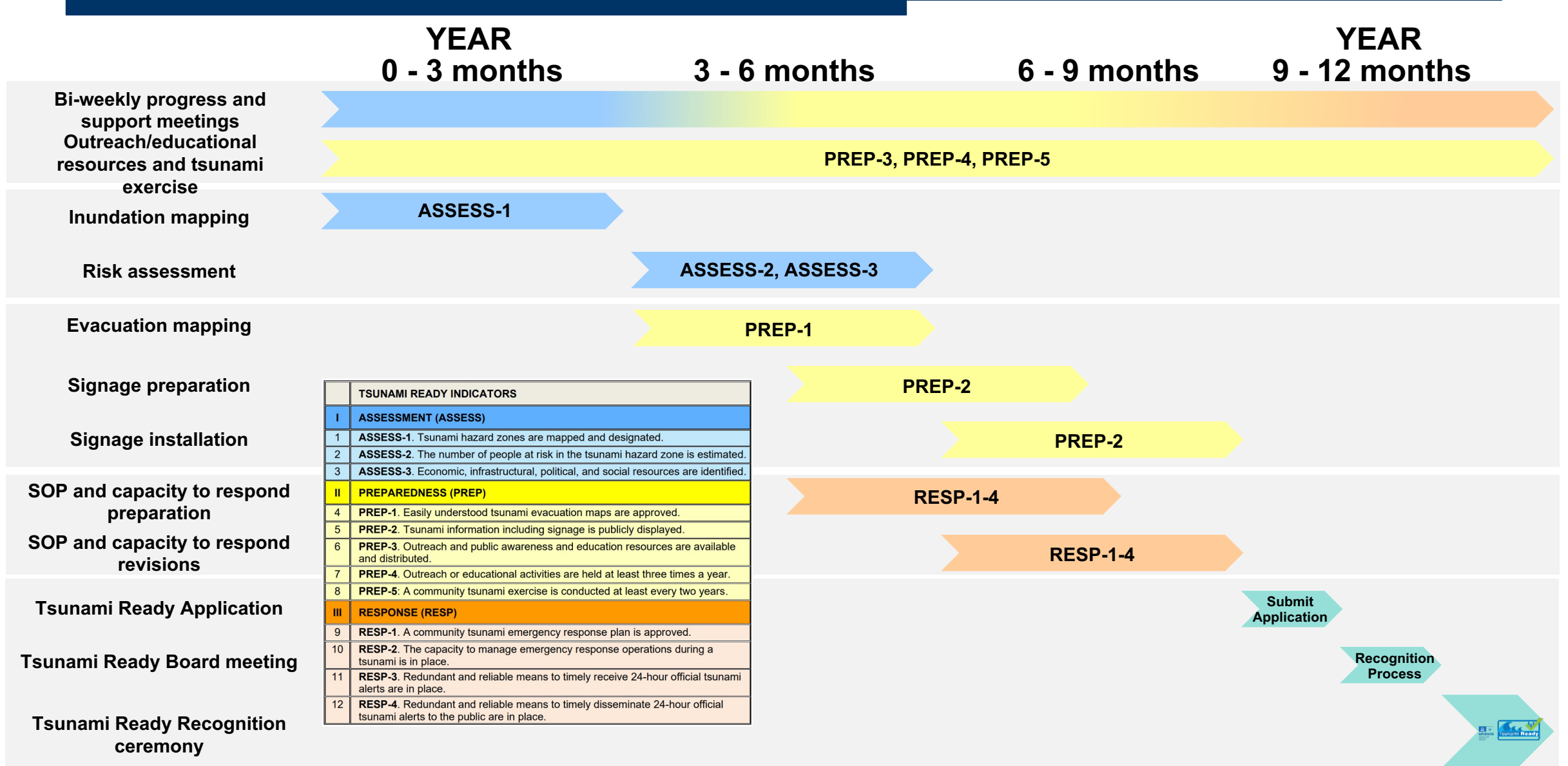
I ASSESSMENT (ASSESS)	
1	ASSESS-1. Tsunami hazard zones are mapped and designated
2	ASSESS-2. The number of people at risk in the tsunami hazard zone is estimated
3	ASSESS-3. Economic, infrastructural, political, and social resources are identified
II PREPAREDNESS (PREP)	
4	PREP-1. Easily understood 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 <u>are held at least three times a year</u>
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**



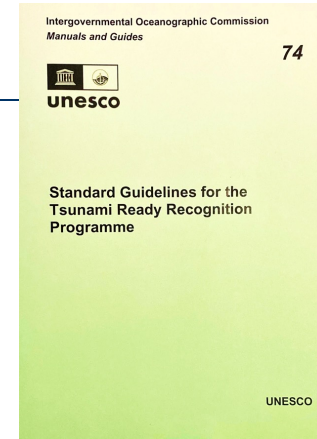


# Tsunami Ready Recognition 1 year timeline





# How to get Tsunami Ready



- ❑ **Standard Guidelines for the Tsunami Ready Recognition Program** (IOC Technical Series 74, 2022)
- ❑ **Facilitated by IOC Tsunami Information Centres**  
Contact International Tsunami Information Centre (ITIC, [itic@unesco.org](mailto:itic@unesco.org), [laura.kong@noaa.gov](mailto:laura.kong@noaa.gov))
- ❑ **Tsunami Ready web site – information, resources**  
[www.tsunamiready.org](http://www.tsunamiready.org)



**Be Safe. Be Prepared. Get Pacific Tsunami Ready!**  
**LINKS: [Pacific Islands](#) [Western Pacific](#) [Eastern Pacific](#)**



Click below  
for video  
PICT





# THANK YOU

# Vinaka Vaka Levu

**For more information:**

**web: [tsunamiready.org](https://tsunamiready.org)**

**e-mail: [itic@unesco.org](mailto:itic@unesco.org)**

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