

Escuela Nacional de Protección Civil, Spain, 25-26 September 2017



United Nations  
Educational, Scientific and  
Cultural Organization

Organisation  
des Nations Unies  
pour l'éducation  
la science et la culture

Organización  
de las Naciones Unidas  
para la Educación  
la Ciencia y la Cultura

Организация  
Объединенных Наций по  
вопросам образования  
науки и культуры

• Intergovernmental  
Oceanographic  
Commission

• Commission  
océanographique  
intergouvernementale

• Comisión  
Oceanográfica  
Intergubernamental

• Межправительственная  
океанографическая  
комиссия

# Information meeting on North eastern Atlantic and Mediterranean, and connected seas Tsunami Warning and mitigation System and NEAMWave 17

**Thorkild Aarup, Head of Tsunami Unit**

*Intergovernmental Oceanographic Commission of UNESCO*

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# Intergovernmental Oceanographic Commission of UNESCO

- The only **intergovernmental** body in the **UN system** specializing in **ocean science, services, observations, data exchange** and **capacity development**
- Since 1960, now **148** Member States
- Competent international organization for marine science (United Nations Convention on the Law of the Sea - UNCLOS)
- Functional autonomy from UNESCO



# IOC in numbers

- IOC was **founded in 1960**
- IOC has **148 Member States** (2017)
- **Our governing bodies** are the IOC Assembly and the Executive Council – who set the programme of IOC in **functional autonomy** from UNESCO governing bodies
  
- IOC budget comes from
  - the **UNESCO regular budget** (\$5 million / year, after US non-payment starting 2011)
  - **voluntary contributions** (contributions from member states and donors), and
  - **projects** (e.g. GEF, EC)



# IOC Medium Term Strategy 2014-2021



## *Vision*

Strong scientific understanding and systematic observations of the changing world climate and ocean ecosystems shall underpin global governance for a healthy ocean, and global, regional and national management of risks and opportunities from the ocean

- Medium Term Objectives
  - **Healthy ocean**
  - **Early warning** for ocean hazards
  - Resilience of society and ecosystems to **climate change** & variability
  - Knowledge of **emerging** ocean science **issues**



One planet, one ocean

# Four major global frameworks

**Paris Agreement  
UNFCCC**

**Agenda 2030  
SDG 14  
'Life below water'**

**SIDS  
SAMOA  
Pathway**

**Sendai Framework  
for Disaster Risk  
Reduction**

**The New York Times**

**TOLL IN UNDERSEA EARTHQUAKE PASSES 25,000; A THIRD OF THE DEAD ARE SAID TO BE CHILDREN**

**FEAR OF DISEAS**

**Supermarket Giants Crush Central American Farmers**

**In Drowned Village, Grim Searches, Quick Burials**

**That Line at the Ferrari Dealer? It's Bonus Season on Wall Street**

**At Warning Center, Alert for the Quake, None for a Tsunami**

**Supermarket Giants Crush Central American Farmers**

**In Drowned Village, Grim Searches, Quick Burials**

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**THE TIMES OF INDIA**

**SEA OF DEATH**

**DEATHS RISE**

**NET IN MY PLEASE**

**Board backs Mukesh. Anil braces for war**

**'We saw the sea coming, we all ran. But God saves little'**

**24000 & RISING: INDIA 7000, LANKA 12000**

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**24000 & RISING: INDIA 7000, LANKA 12000**

**Painful scenes at GHs in city**

**City struggles to cope with relief work**

**The Day The Tide Turned, And Turned**

**City Express**

**Tsunamis hit Chennai**

**Earthquake in the sea near Indonesia generates monstrous waves**

**Marina Beach and the rest of the coastline battered**

**Over 152 people dead**

**Thousands homeless**

**An Ambassador car and construction material of road stops float on the flooded Marina beach**

**The Nation**

**SUMATRA EARTHQUAKE AFTERSHOCK**

**CATASTROPHE**

**Tsunami toll soars**

**Thailand deaths may top 2,000, says PM**

**Frantic search for survivors continues**

**21,000 reported dead throughout region**

**Tidal Wrath**

**Winnipeg Free Press**

**Thousands swept to death**

**Manitobans pray for families' lives**

**Manitobans pray for families' lives**

**Manitobans pray for families' lives**

**Hindustan Times**

**MORNING AFTER CHRISTMAS... Tsunami smashes Asia**

**3,000 DEAD IN INDIA, 9,300 IN ALL; 8.9 SUMATRA QUAKE SETS OFF GIANT WAVES**

**What is Tsunami?**

**More coming**

**Just water all around'**

**Looking for... Hard to believe**

**Just move your finger, not your foot**

**hindustantimes**

**26/11 phone trail points to local links**

**Officials build lavish homes at your expense**

**Will never see INDIA'S STRIP DOGS, JERMAN**

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# 11 Deadly Tsunamis Since 2004

- Pacific Ocean: 6 Tsunamis killing over 17,000 people
  - 2007 (2), 2009, 2010, 2011, 2013
  - [Note 2014 Chile Tsunami - no direct deaths due to tsunami but due to earthquake]
- Indian Ocean: 5 Tsunamis killing over 230,000 people
  - 2004, 2005, 2006 (2), 2010



**International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean within a Global Framework**

UNESCO Headquarters, France,  
3–8 March 2005



**Second International Coordination Meeting for the Development of a Tsunami Warning and Mitigation System for the Indian Ocean**

Grand Baie, Mauritius  
14–16 April 2005



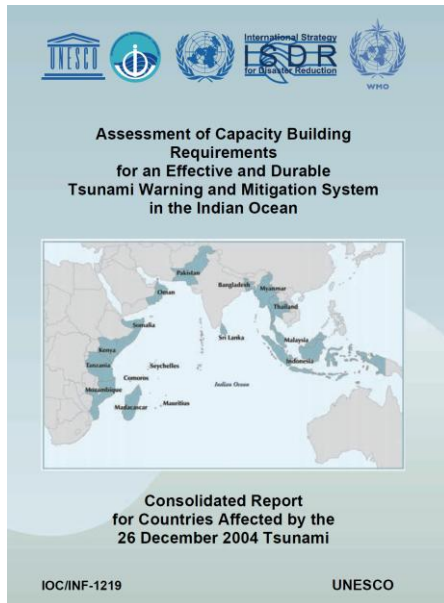
**Twenty-third Session of the Assembly**

Paris, 21–30 June 2005

UNESCO

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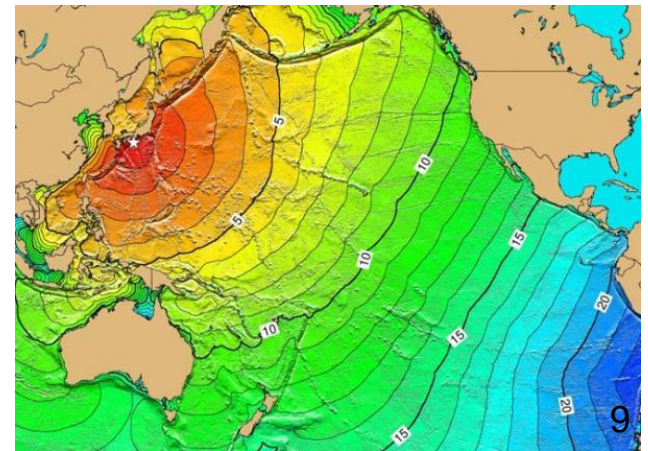
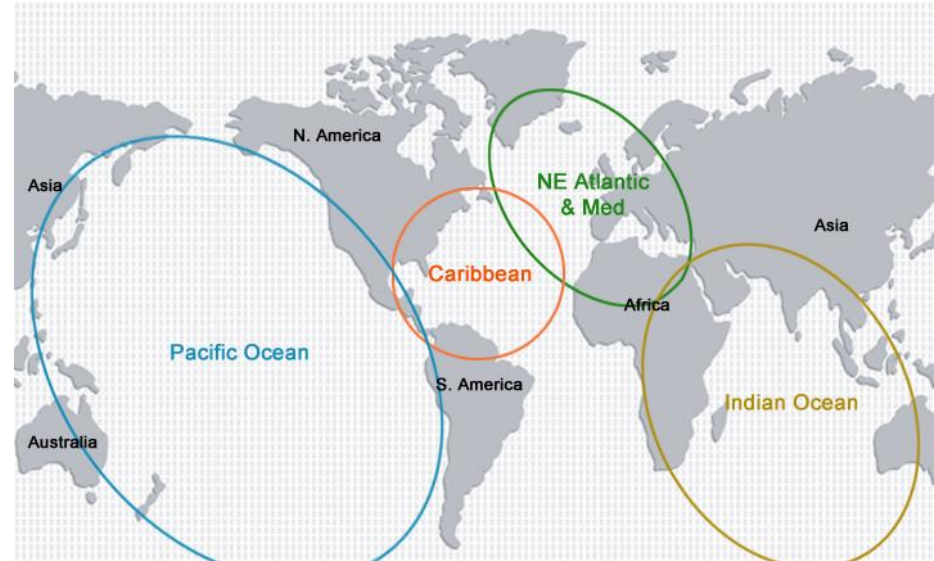


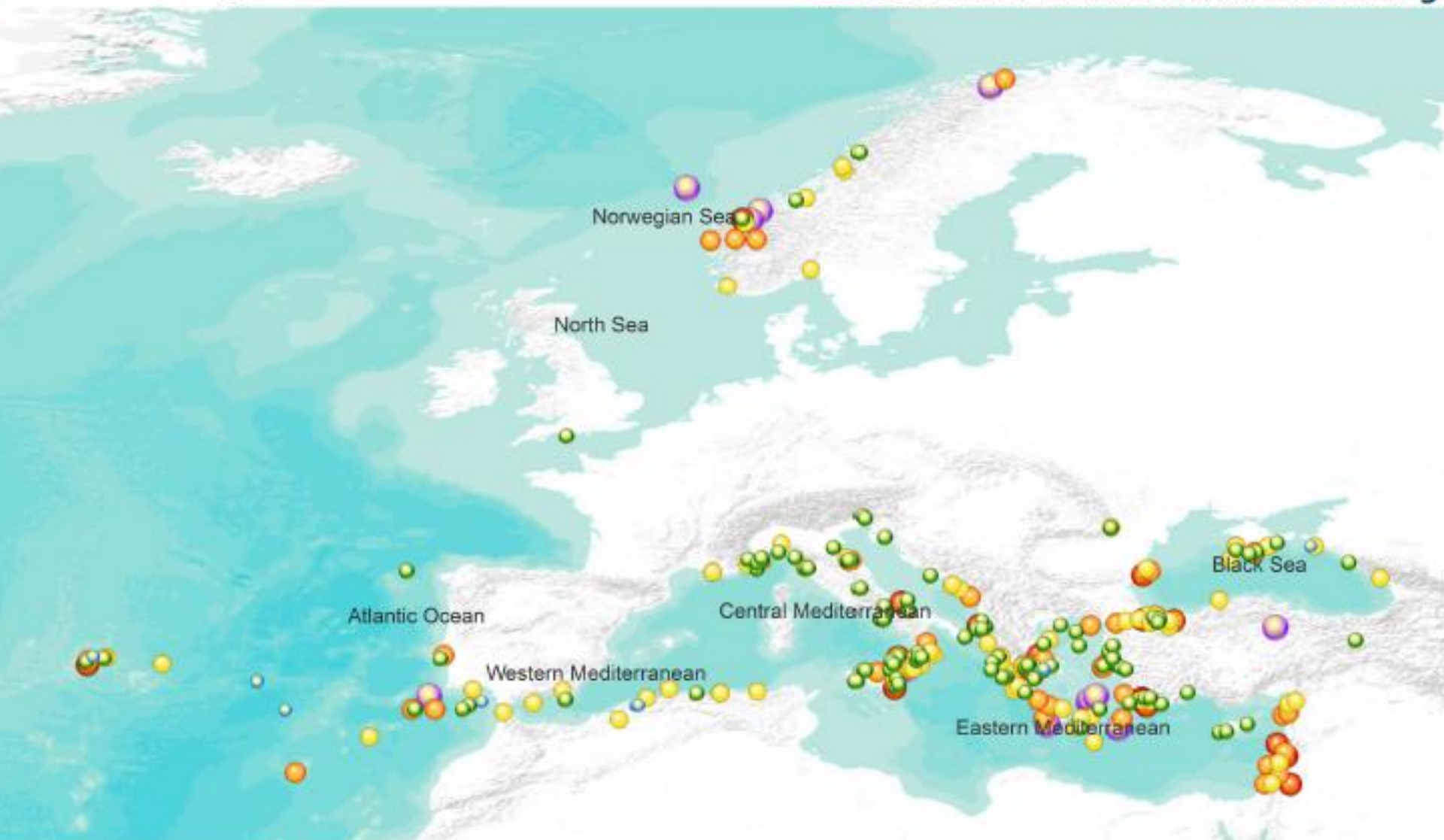
2004 event triggered a new era for the IOC's tsunami program: Intergovernmental Coordination Group meeting reports, Technical Working Groups, Training reports, ..



# Tsunami Warning Systems

- Pacific since 1965
- 2004 tsunami in Indian Ocean illustrated need for more
- IOC mandated to establish three more TWS
  - ICG IOTWS
  - ICG CARIBE EWS and
  - ICG NEAMTWS





### Tsunami Intensity



Cite as: Maramai, et. al, (2014), The Euro-Mediterranean Tsunami Catalogue, ANNALS OF PHYSICS, 57, 4, 2014

The Euro-Mediterranean Tsunami Catalogue (EMTC), contains 290 tsunami events, occurred in the European and Mediterranean seas since 6150 B.C. to present days.

The online version of the EMTC (available at <http://istituto.ingv.it/ingv/archivi-e-banche-dati>) provides, for each event detailed descriptions, pictures, photos, tide-gauge records and the full list of bibliographical sources.

Most of the events have a high reliability value (3= "probable" and 4= "definite") which makes the Euro-Mediterranean tsunami catalogue an essential tool for the implementation of tsunami hazard and risk assessment.

The plotted coordinates of each tsunami event refer to those triggering cause: earthquake, volcanic eruption or landslide.

# Tsunamis in NEAM region

- Bourmerdes earthquake and Tsunami (21 May 2003)
- Tsunamis recorded in the NEAMTWS region (e.g. Aegean Sea (12 June and 21 July 2017), Alboran Sea (25 January 2016) and Ionian Sea (17 November 2015))
- **National preparedness and public awareness of Tsunami risk in NEAM region ?**

# Spain & NEAM Tsunami Warning System

- Tsunami National Contact and Tsunami Warning Focal Point appointed
- Contributes to NEAMTWS Tsunami Detection Network (seismic and sea level stations)
- ICG/NEAMTWS VIII meeting (Santander, 22-24 Nov 2011)
- Till 2015 Co-chair of ICG/NEAMTWS WG3 Sea Level Data Collection and Exchange, Including Offshore Tsunami Detection and Instruments
- AECID support towards El Salvador Tsunami vulnerability study and maps
- Community of Experts involved in EU projects, Oman MHEWS
- Today's information meeting – first at a NEAM CPA

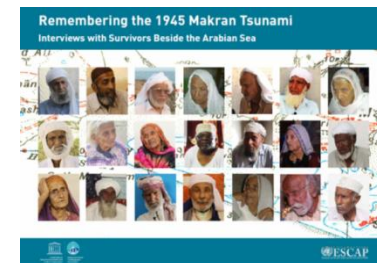
# Tsunami Warning Systems: Essential Elements

- Intergovernmental Coordination incl. technical WGs
- Detection, Warning & Dissemination (Alert centers, monitoring network, communication, data exchange)
- Awareness & Response: Public education, emergency planning and response (training, hazard assessment, SOPs, inundation mapping, evacuation planning, TWS exercises)



# Tsunami Information Centre (TIC)

- A perfect warning will be useless if people do not know what to do in case of an emergency. Community awareness and preparedness is essential
- The role of TICs is to increase the awareness of different target groups (e.g. students, tourist, civil protection authorities, coastal managers + other groups )



# Tsunami Information Material & Manuals

10 Years of the North-Eastern Atlantic, the Mediterranean and Connected Seas Tsunami Warning and Mitigation System (NEAMTWS)

Accomplishments and Challenges in Preparing for the Next Tsunami

LA CONNAISSANCE RENFORCE LA SÉCURITÉ ET NEAMTWC VOUS APORTE CETTE CONNAISSANCE !

Centre d'Information Tsunami pour l'ATLANTIQUE NORD-EST ET LA MÉDITERRANÉE

NEAMTWC est un projet de deux ans financé par la Direction générale des Transports et protection civile de l'Union Européenne.

NEAMTWC se construit en partenariat avec :

- Le Commissariat à l'énergie atomique et aux énergies alternatives (France)
- l'Institut National de la Mer et de la Pêche (France)
- l'Institut National de la Mer (Italie)
- National Observatory of Athens (Grèce)
- Faculté de Faculté de Sciences de l'Université de Lisbonne (Portugal)

Par ailleurs, NEAMTWC est soutenu par :

- Karadeniz Observatory and Earthquake Research Institute (Turquie)
- L'Organisation internationale pour l'éducation, des Sciences et de la Culture (OIESCO)

## East Japan Earthquake and Tsunami

Key Lessons for the Education Sector

E-HFA

- Structure, Location, Layout of Schools
- Function of Schools and Educational Continuity
- Human Resources and Training
- Effectiveness of Disaster Preparedness
- New Role of School and Multi-stakeholder Dialogue

Safe Location, Safe Building

Community of Compulsory Education

Evacuation Center

Budget

Population Drain

Aging and Declining Birthrate

Lack of Teachers and Educational Materials

Mental Health Care

1. SCELTA DELL'EDIFICIO

2. SCELTA DEL SITO

3. SCELTA DELLA STRUTTURAZIONE

4. SCELTA DELLA STRUTTURAZIONE

5. SCELTA DELLA STRUTTURAZIONE

Intergovernmental Oceanographic Commission Workshop Report No. 266

Improving Tsunami Warning and Emergency Response in the North-Eastern Atlantic, Mediterranean and Connected Seas

IOC-UNESCO-ISESOC Workshop Rabat, Morocco 23-24 September 2014

Summary Recommendations

Tsunami Warning and Mitigation Systems to protect Coastal Communities

FACTSHEET MAY 2015

Tsunami Early Warning and Mitigation System in the North-Eastern Atlantic, the Mediterranean and Connected Seas (NEAMTWS) 2005-2015

Intergovernmental Oceanographic Commission Manuals and Guides 62

TSUNAMI RISK ASSESSMENT AND MITIGATION FOR THE INDIAN OCEAN

KNOWING YOUR TSUNAMI RISK - AND WHAT TO DO ABOUT IT

July 2015

UNESCO

Manuals and Guides 76

Intergovernmental Oceanographic Commission

PLANS AND PROCEDURES FOR TSUNAMI WARNING AND EMERGENCY MANAGEMENT

UNESCO

Commission océanographique intergouvernementale de l'UNESCO

Manuels et Guides N°49

PRÉPARATION AUX TSUNAMIS

GUIDE D'INFORMATION À L'INTENTION DES RESPONSABLES DE LA PLANIFICATION EN CAS DE CATASTROPHE

Janvier 2008

UNESCO

Intergovernmental Oceanographic Commission

Manuals and guides, 57

REDUCING AND MANAGING THE RISK OF TSUNAMIS

UNESCO

NEAMTWC July 2012

Tsunami Preparedness Civil Protection - Good Practices

مصدر مصطلحات التسونامي

UNESCO

TSUNAMI GLOSSARY 2013

Technical Series 05

UNESCO

En quelques minutes, la première vague déferle

Survivre aux tsunamis : l'Indonésie livre ses enseignements

TSUNAMI

Les grandes vagues

UNESCO

IOC

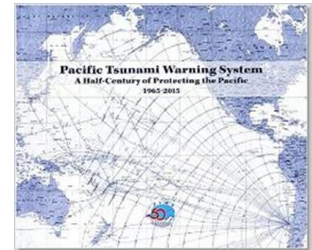
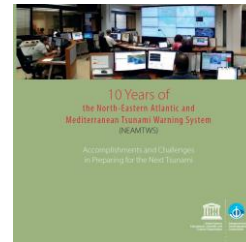
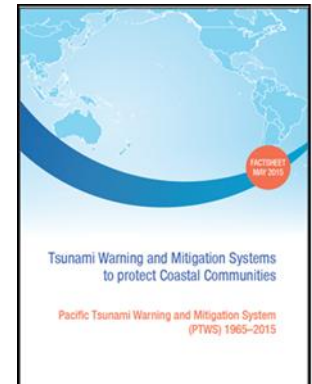
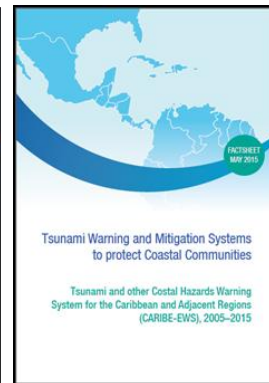
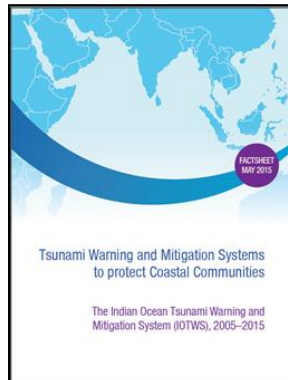
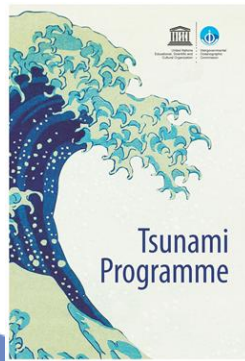
# Achievements and Results

- Reinforced and sustained intergovernmental process since 2005 (49 ICG meetings, 10 TOWS-WG)
- Organised more than 120 technical working group and workshops on hazard management, Standard operating procedures, coastal inundation modelling, ..
- 19 Tsunami Wave Exercises organised
- Manuals and technical documents in various languages published
- Three additional regional TWS established

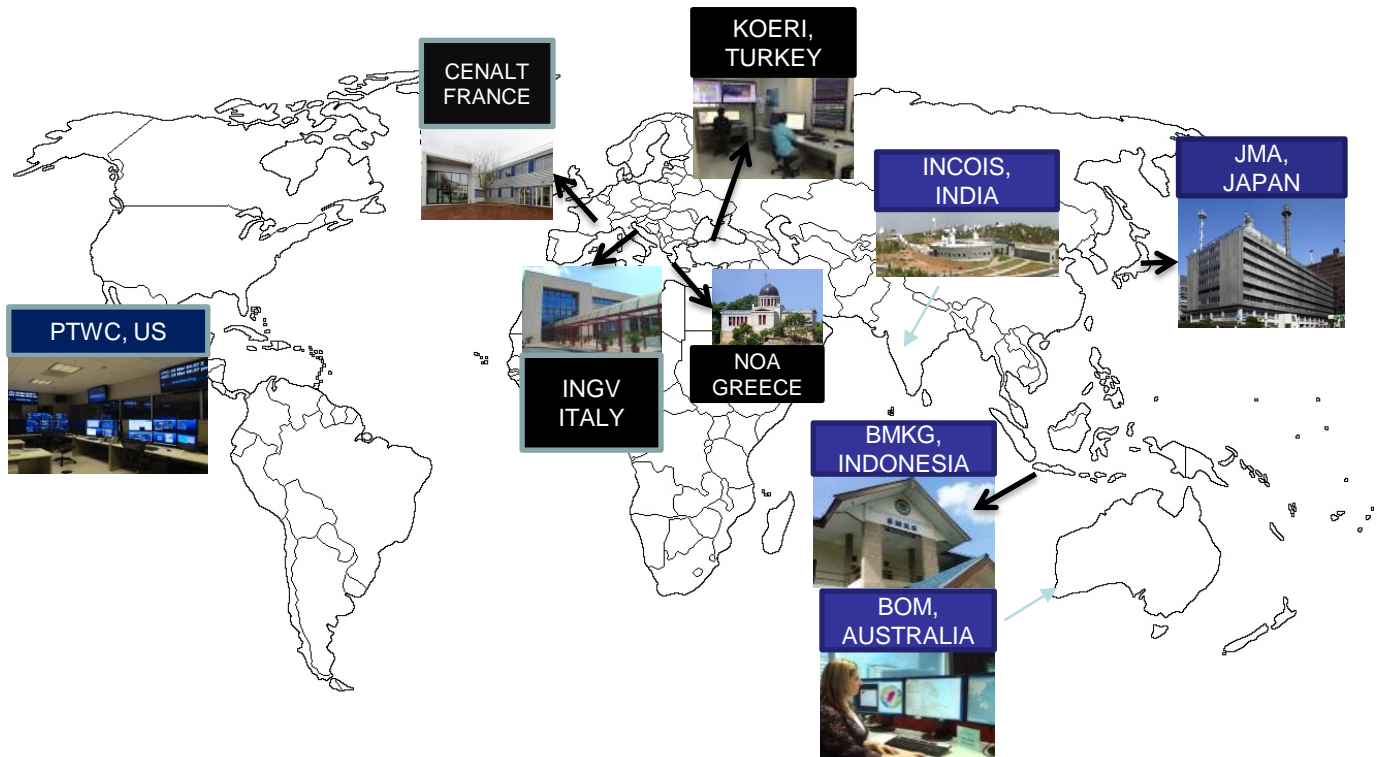


# Achievements and Results (cont.)

- Seven new Tsunami Service Providers established – three in the Indian Ocean and four in the NE Atlantic and Mediterranean region.
- Considerable national investments and contributions to TWS
- 2015 was
  - 10 year anniversary for CARIBE-EWS, IOTWS and NEAMTWS
  - 50 year anniversary for PTWS



# Tsunami Service Providers



**7 New TSPs established since 2004 IO Tsunami**



IOC



**Thank you**

<http://www.ioc-tsunami.org/>

