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Achievements, Challenges and Transformations of NEAMTWS to addressTsunami Risk

An Overview

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UNESCO IOC

Historical and Recent Tsunami Events

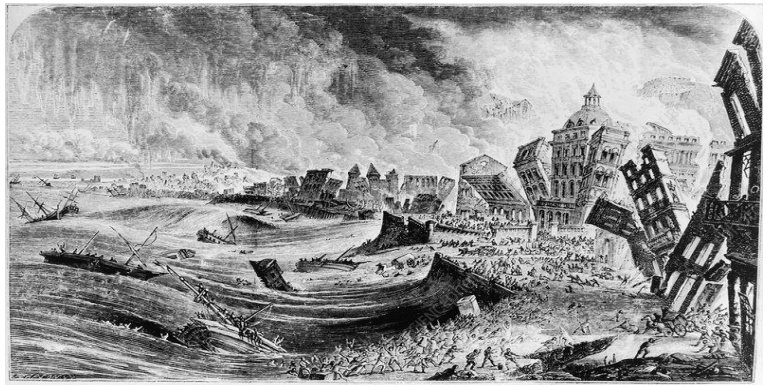
TSP Alerts: 8-11 min
Tsunami waves: 15-20 min
Official Response/ public: >20 min
Reports of some kind kind of 'self-organized' evacuation

THE 1755 EARTHQUAKE & TSUNAMI

-Lisbon was flooded with tsunami waves of 6 m height.

-estimated 60,000 deaths.

-10,000 may have lost their lives in Morocco.



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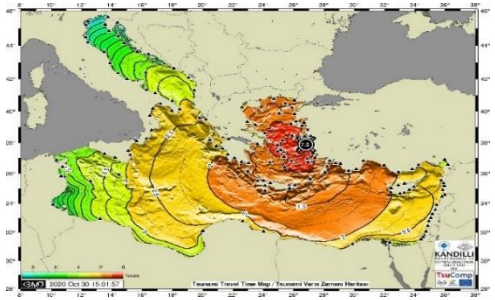
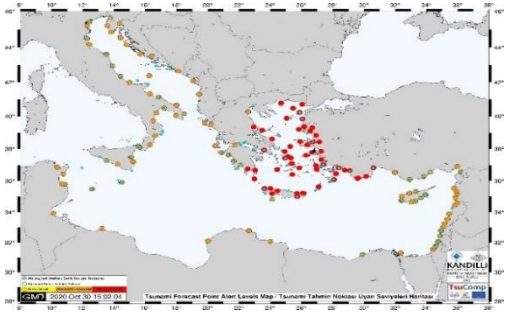
OCT 2020 SAMOS-IZMIR TSUNAMI

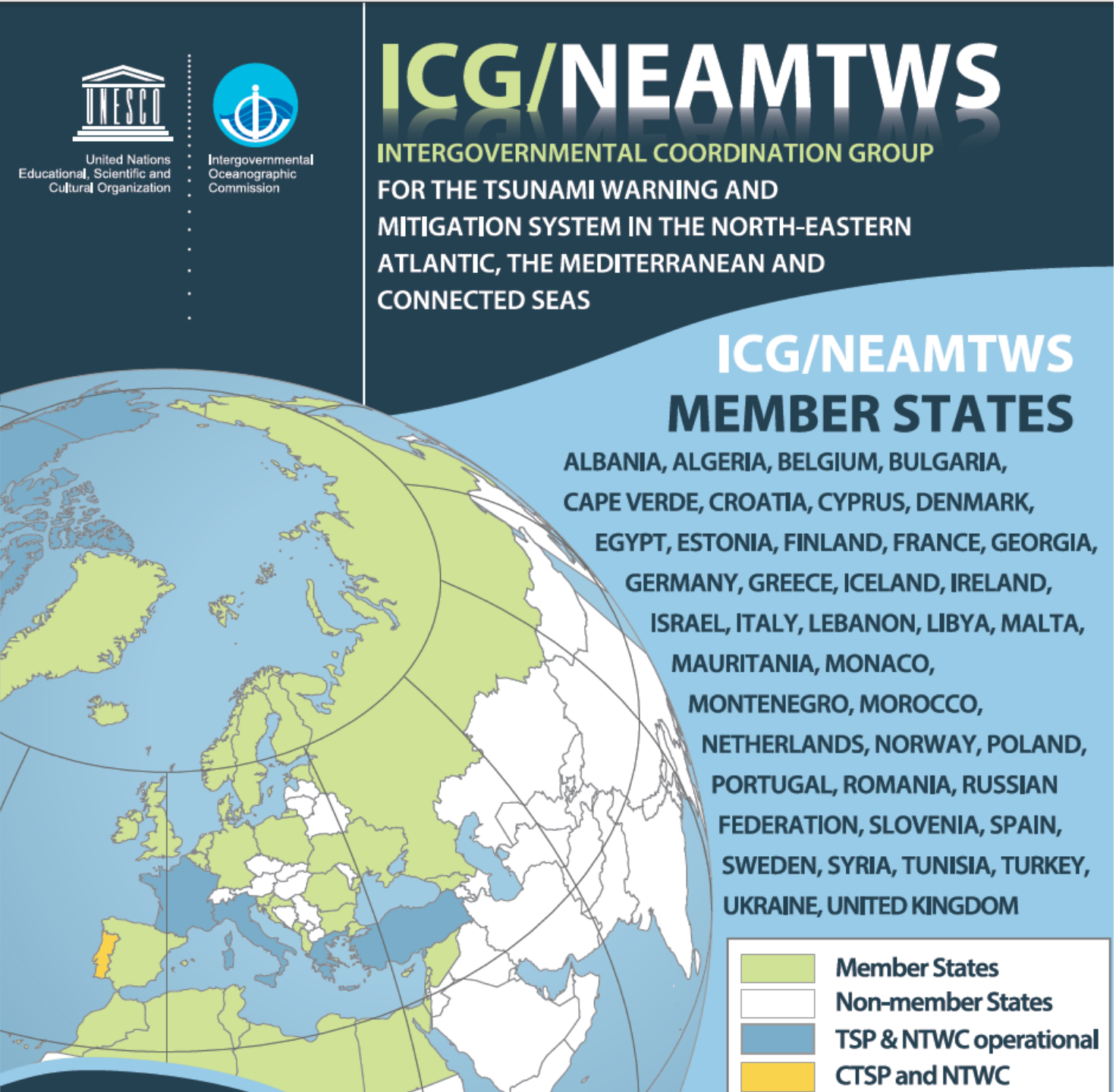
source KOERI, Turkey



Tsunami travel time



Forecast point alert (Watch, Advisory and Information) map,

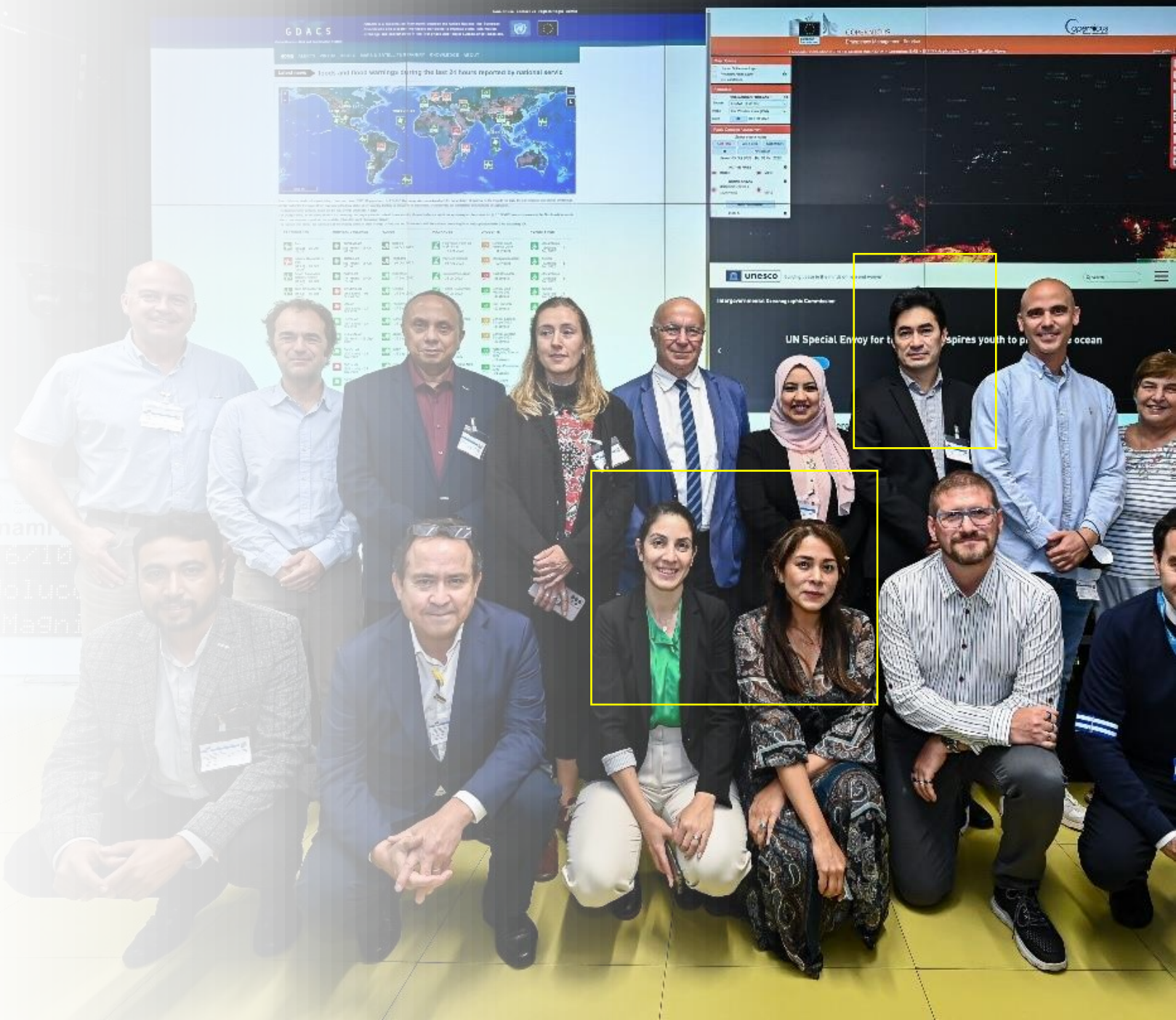


ICG-NEMTWS

- **Establishment:** Following the 26 December 2004 tsunami in the Indian Ocean, IOC started to also coordinate the development of similar warning systems for the North East Atlantic, the Mediterranean and connected seas (ICG/NEAMTWS)
- **Governance:** 40 Member States, Annual ICG sessions, Chair/Vice-Chairs, 3 WGs, 3 TTs, SC
- **Global Agenda/Contributions**: Contribution to Target g (Availability and access to MHEWS) of the Sendai Framework for DRR

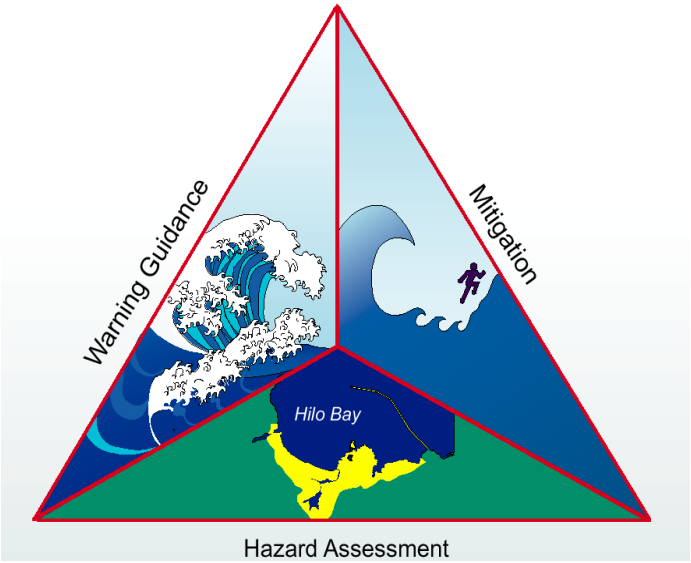
ICG/NEAMTWS Secretariat

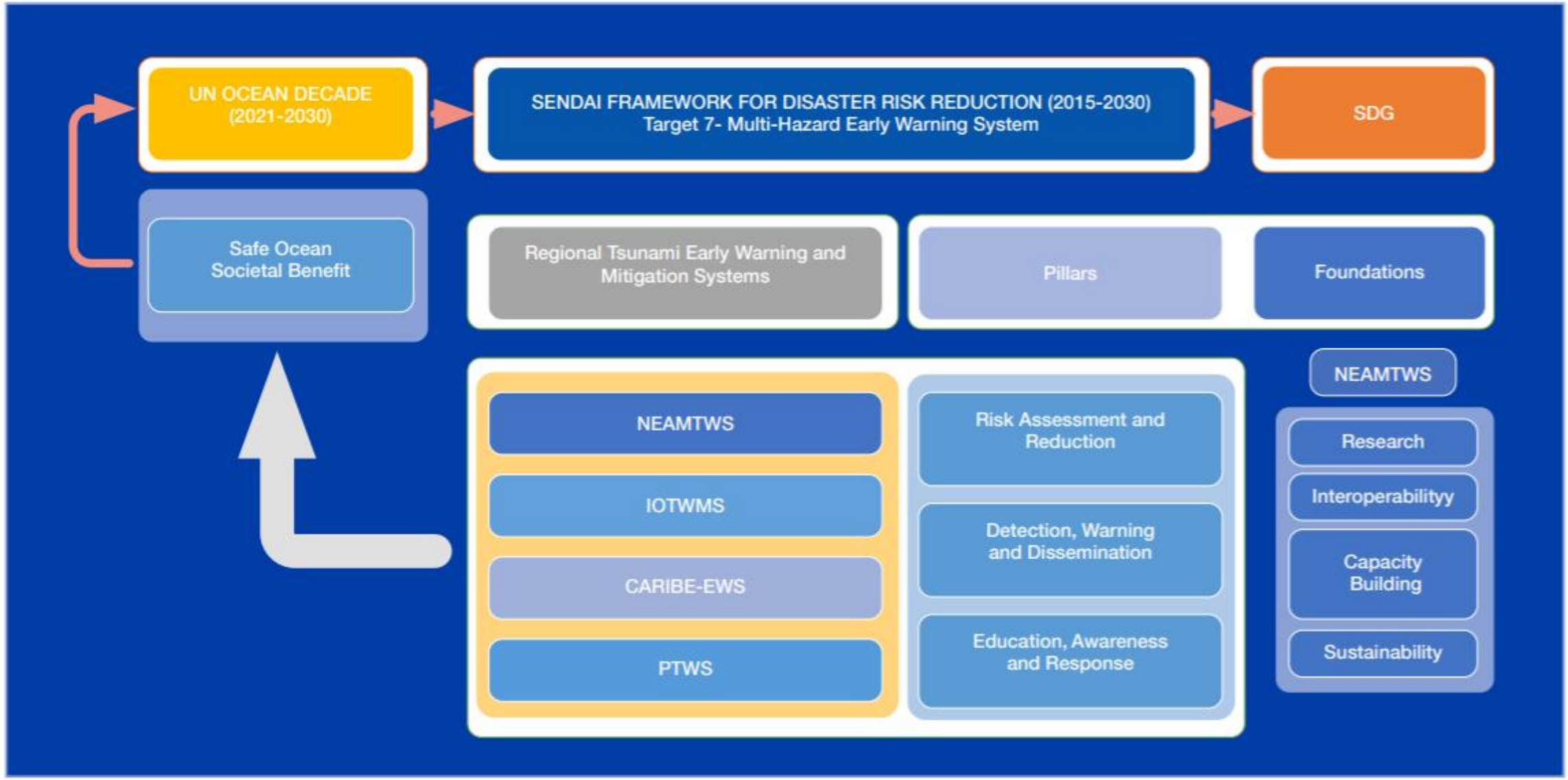
5-6 Team Members



TWS Strategy / Approach/Activities

- Three strategic pillars
  1. Tsunami Hazard / Risk Assessment;
  2. Warning System Development
  3. Preparedness and Awareness
- TEWS design is end-to-end and people centered
  - ➢ People need to know what to do in presence of natural signs (e.g. earthquake/ rapid sea level changes), <u>with</u> or <u>without an official warning</u>.



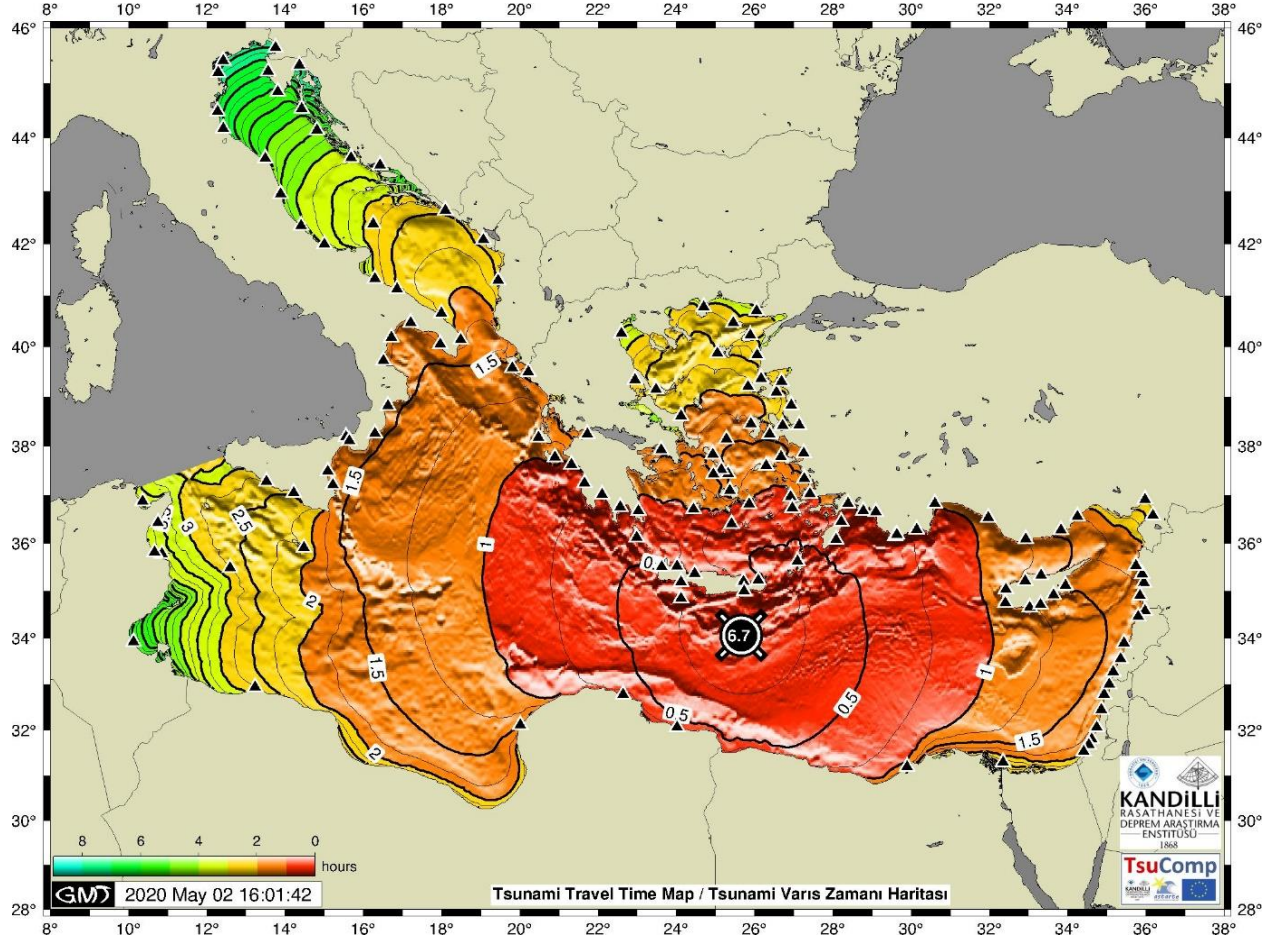


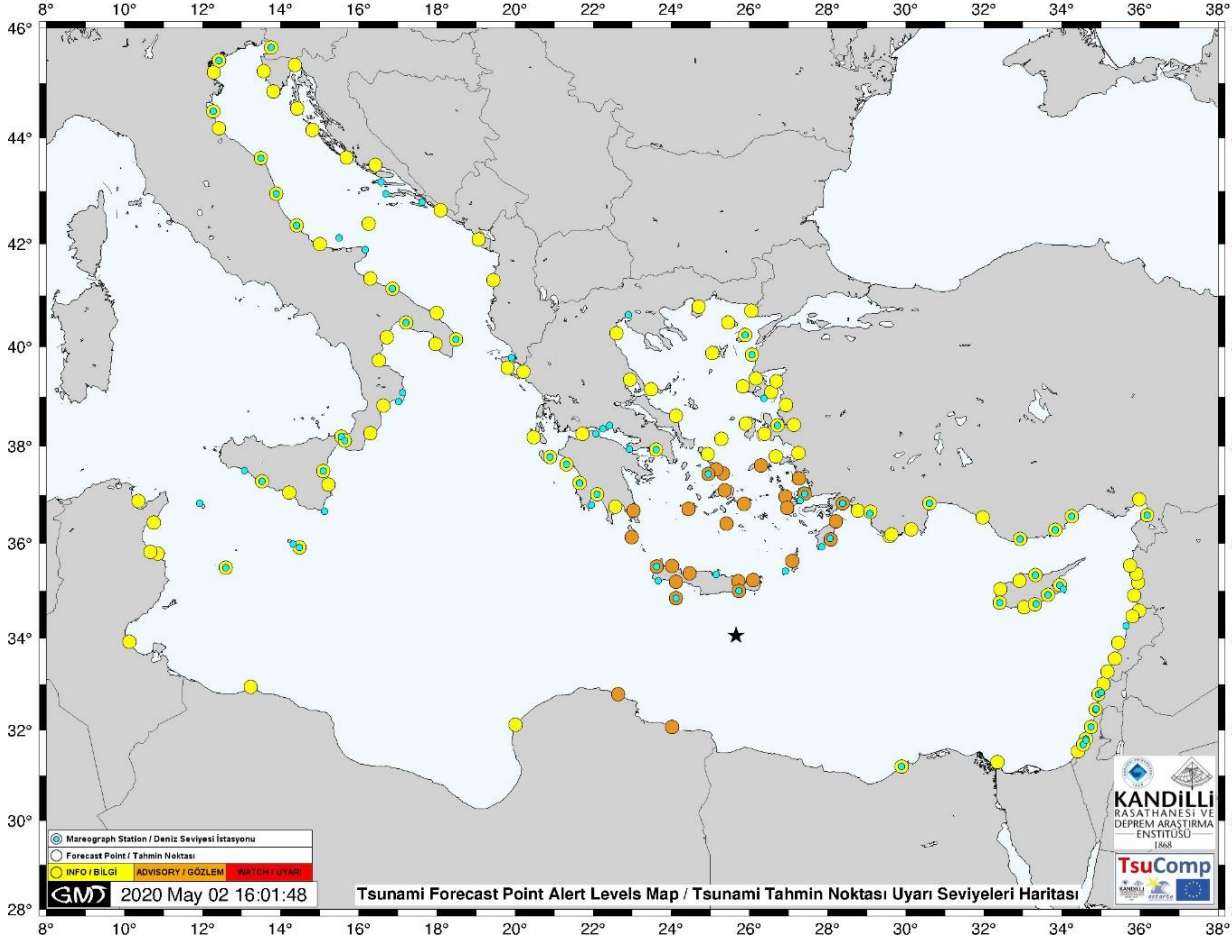
IOTWMS: Indian Ocean Tsunami Warning and Mitigation System
CARIBE-EWS: Caribbean Early Warning System
PTWS: Pacific Tsunami Warning System

Key Progress

Enhanced Tsunami Products

TSPs including KOERI (Turkey) have piloted enhanced tsunami products with their subscribers



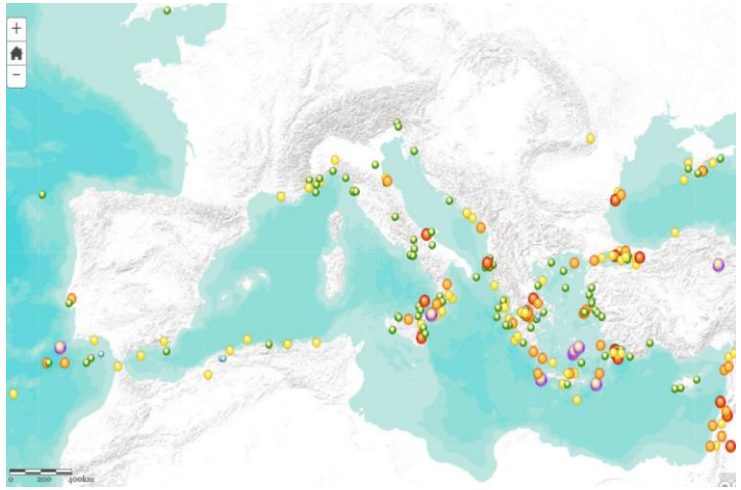


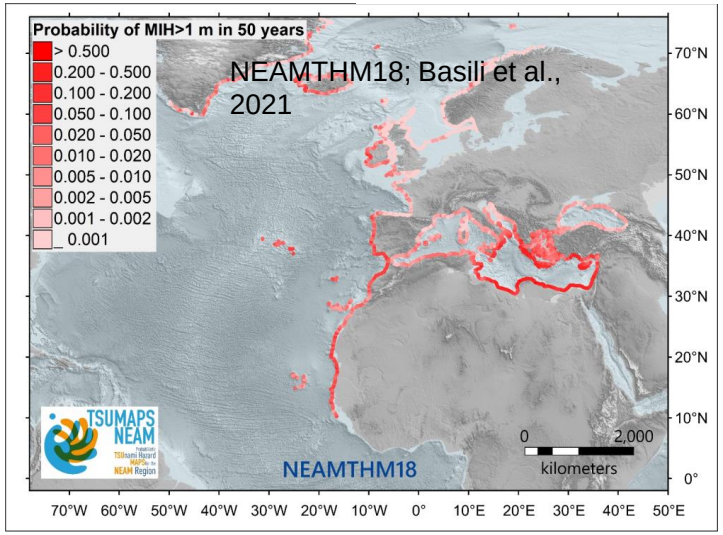
KOERI, Turkey 2020

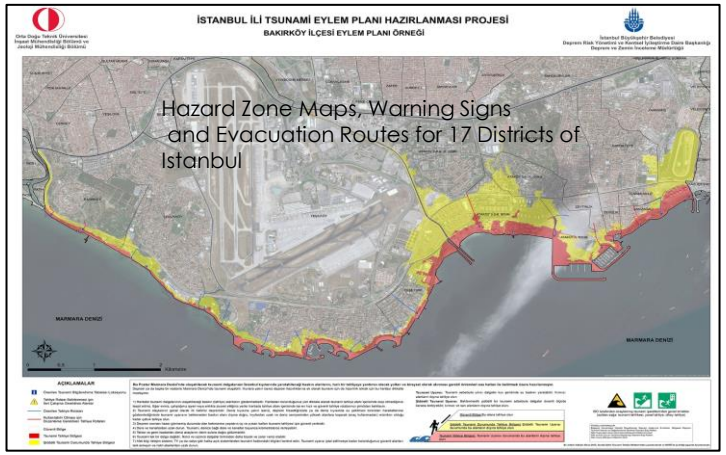
Key Progress

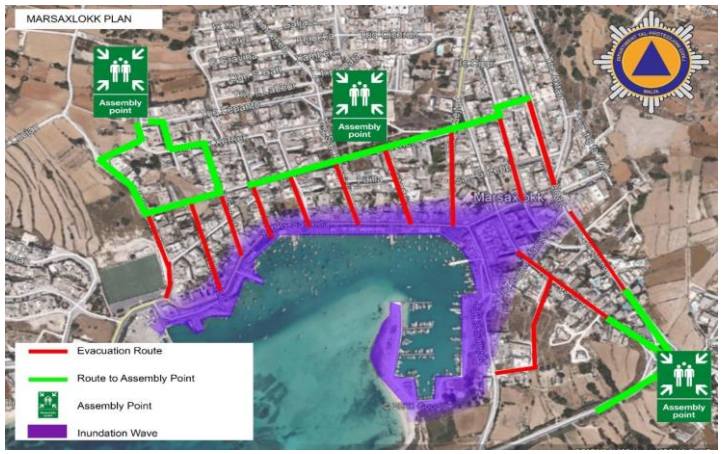
Tsunami Hazard / Risk Assessment

- Over the past two decades, important tools ranging from tsunami databases, tsunami hazard and risk assessments and modelling have been developed in many countries
- TSUMAPS-NEAM EU DHECHO funded project produced PTHA for the entire coastlines of the NEAM region









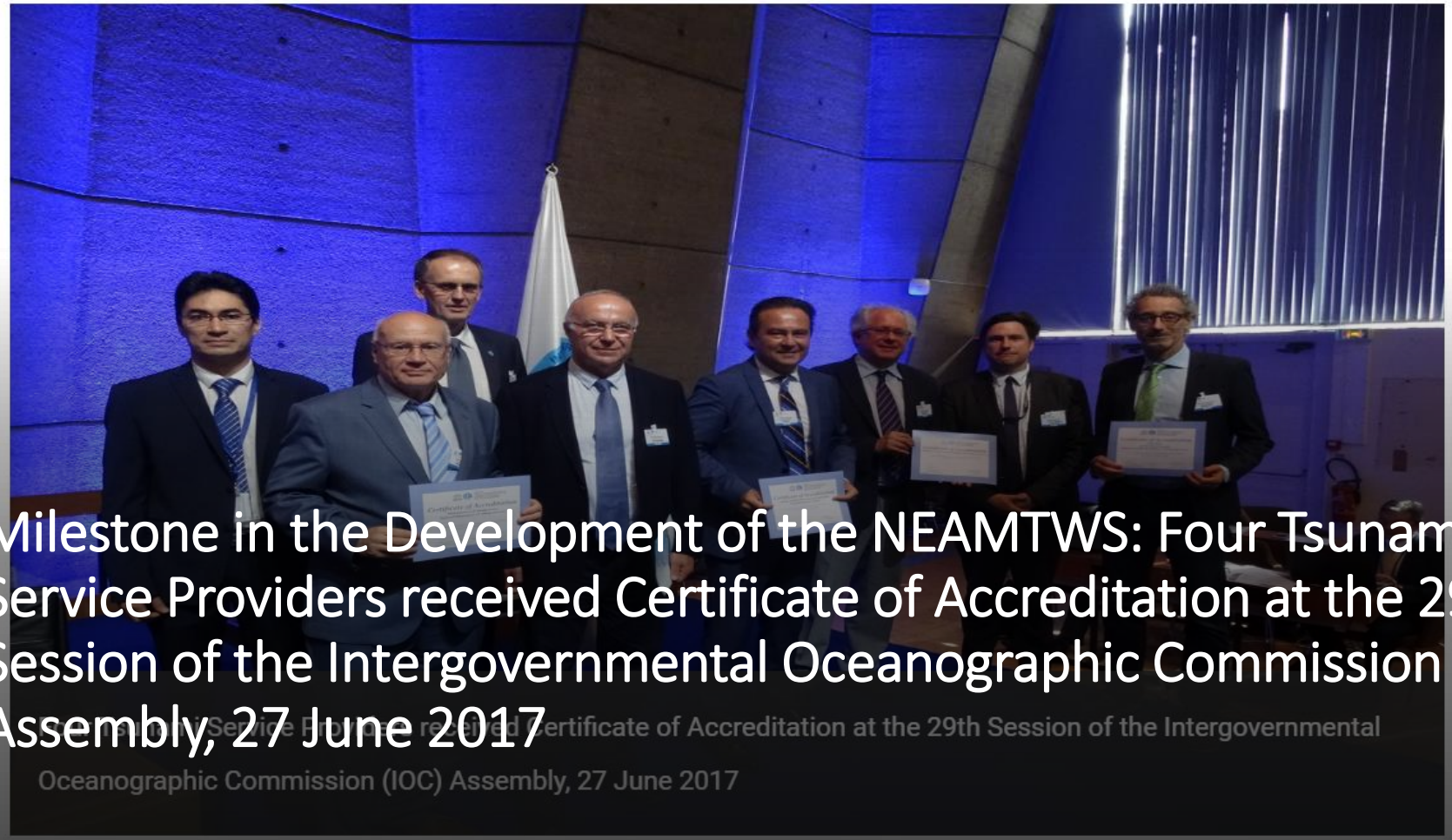
Progress: Mitigation, Preparedness and Awareness

- **27 Regional tsunami exercises** conducted globally [7 Pacific, 10 Caribbean, 6 Indian Ocean since 2009, 4 NEAM region) to test the readiness of EWS and prepare coastal communities to tsunami risks.

- **Several National Exercises**
  - Israel: More than 130,000 children took part in the first ever national tsunami simulation exercise with schools in Israel in 2019.
  - Cannes, Malta-end-to-end exercise
- **Awareness Growing** through World Tsunami Awareness Day in partnership with UNDRR and others, including WMO

- **83 videos** co-prepared/published/NEAMcontributions

Neamtic Home Slider



Milestone in the Development of the NEAMTWS: Four Tsunami Service Providers received Certificate of Accreditation at the 29th Session of the Intergovernmental Oceanographic Commission (IOC) Assembly, 27 June 2017

CENALT also Accredited. NEAMTWS host 5 TSPs of the 11 TSPs Globally

Tsunami Information

NEAMTWS Tsunami Service Providers (TSPs)

NOA (Greece) TSP,
Hellenic National Tsunami Warning Centr

CENALT (France) TSP

INGV (Italy) TSP

KOERI (Turkey) TSP

IPMA (Portugal) CTSP

akes Update

Recent News

Upcoming Events

Through the following wel

Italy launched new sea level observation network to help enhance the detection, monitoring of tsunamis, and other sea level hazards in the Mediterranean Region

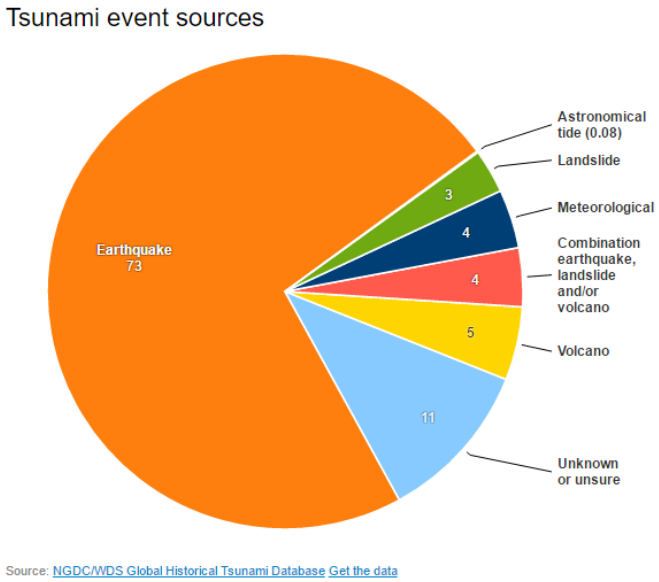
More sea level stations planned in Italy, including deep sea buoys

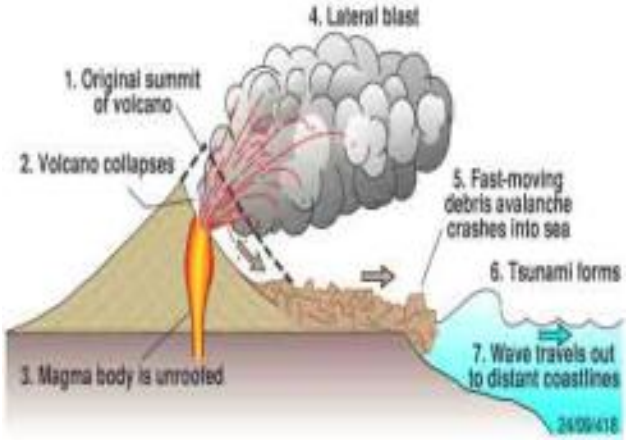
KOERI, Turkey planning to install twenty new sea level stations in the Marmara region to improve the detection and monitoring of coastal hazards in the next coming years.

Gaps & Challenges

Hazards

- **Short time** to warn within 5-20 min.
- **Multi-source and complex** mechanisms of tsunami generation, including non-seismic.
  - submarine landslides, volcano collapses, and certain atmospheric conditions.
- **Surprises**. Historical records are not always useful/reliable





Eg Krakatoa, Indonesia (1883, 2018), Tonga (2022)

Gaps & Challenges

Data Gaps and Sharing of Data

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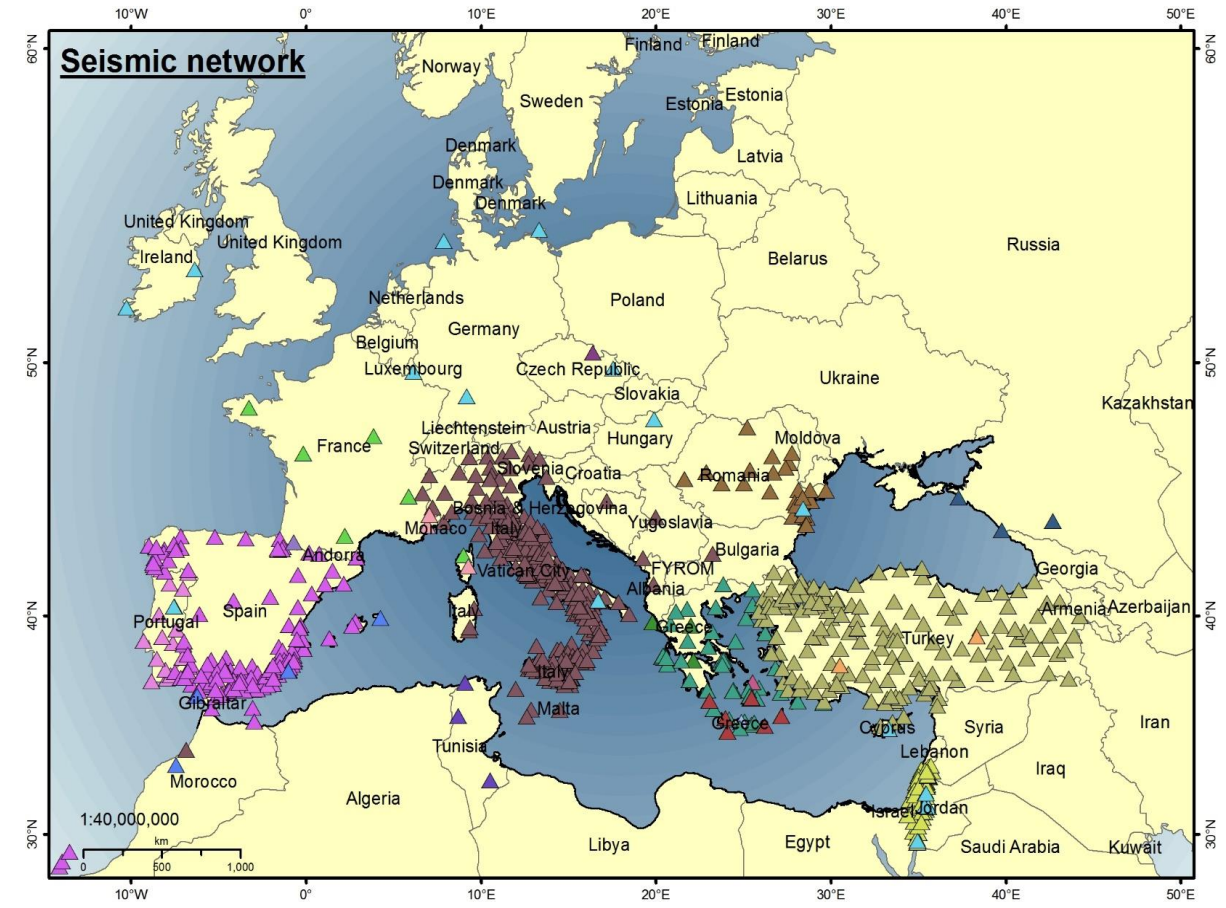
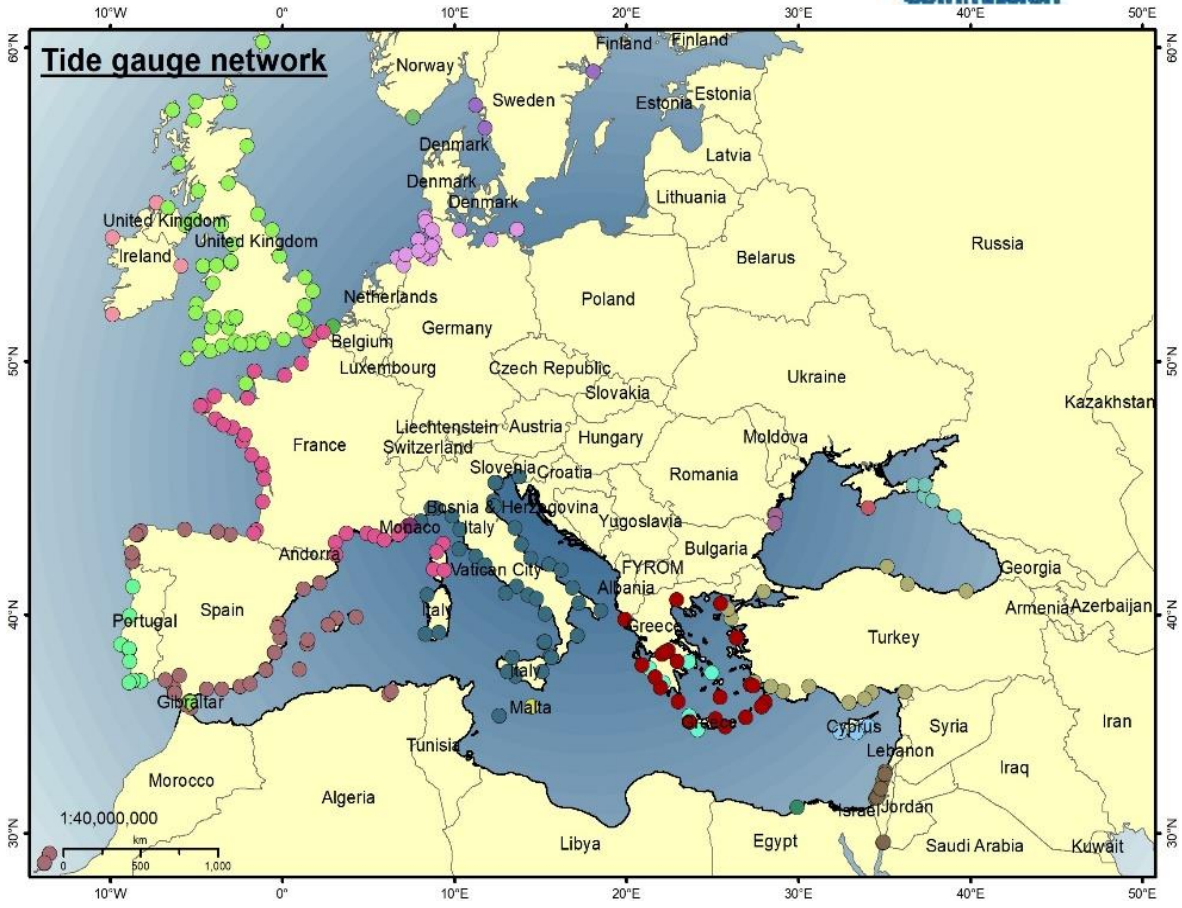




Maps of seismic and sea level networks used by NEAMTWS Tsunami Service Providers (IOC-UNESCO)

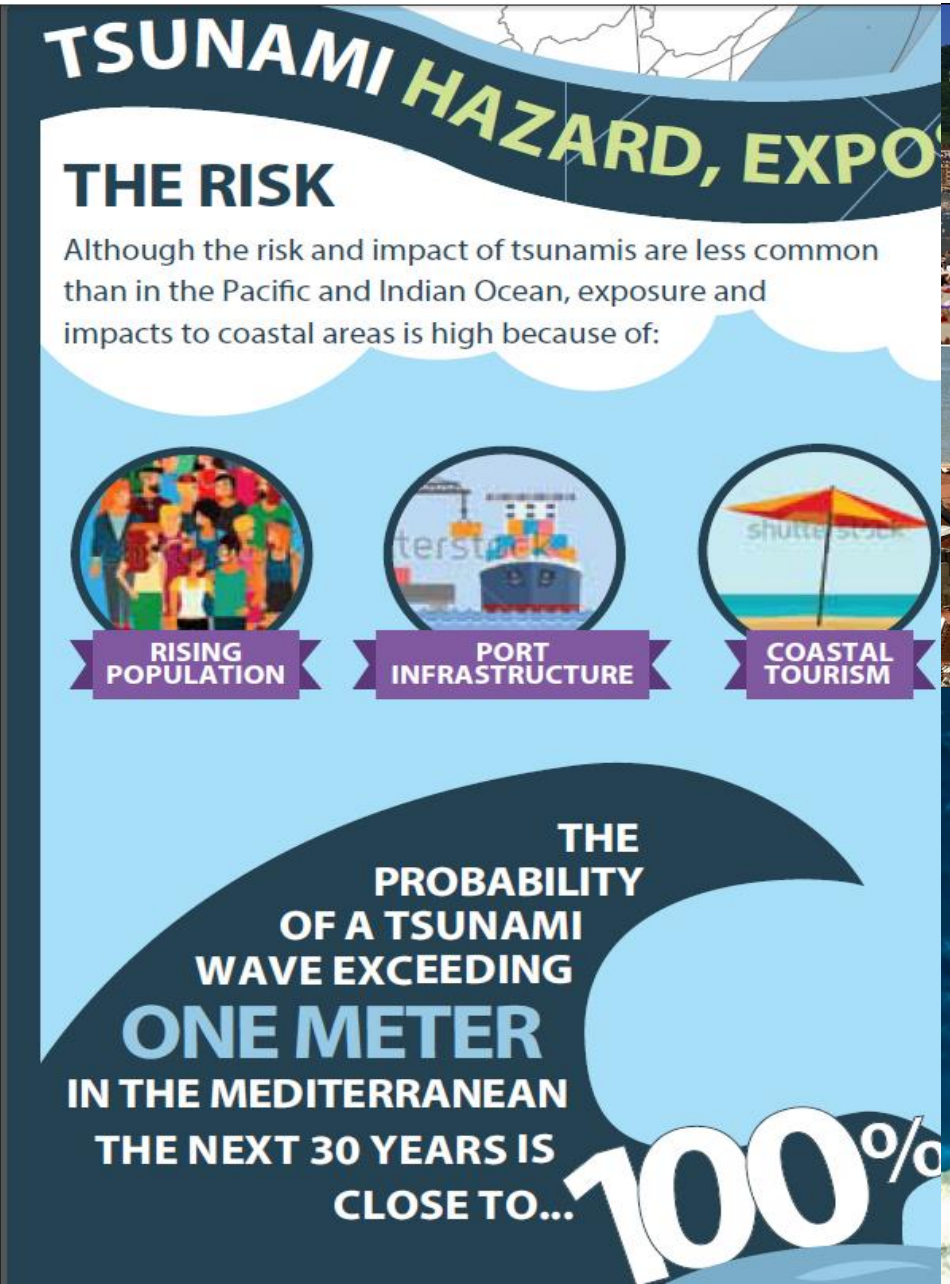
Gaps & Challenges

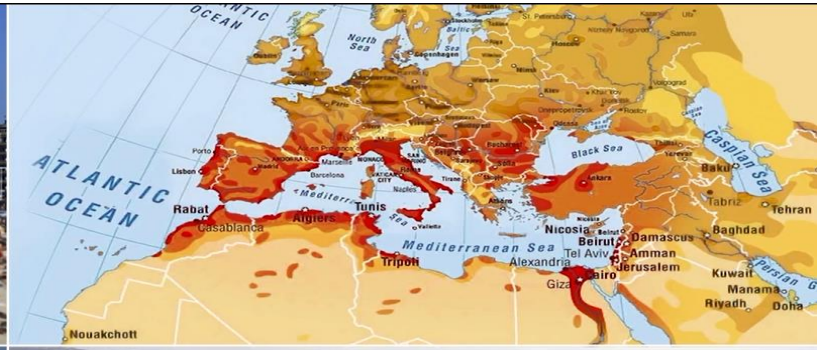
Exposure, Vulnerability and Risks

- Increasing coastal population , coastal tourism activities, blue economy etc
- Low level of awareness and preparedness.
- Lack of Governance e.g., regulations, policies, standard operating procedures are usually lacking, especially in connecting national to the community level.
- Coastal urban planning and management

Vulnerability and Risk Perspective

Low Probability of Occurrence, High Risk and Impact

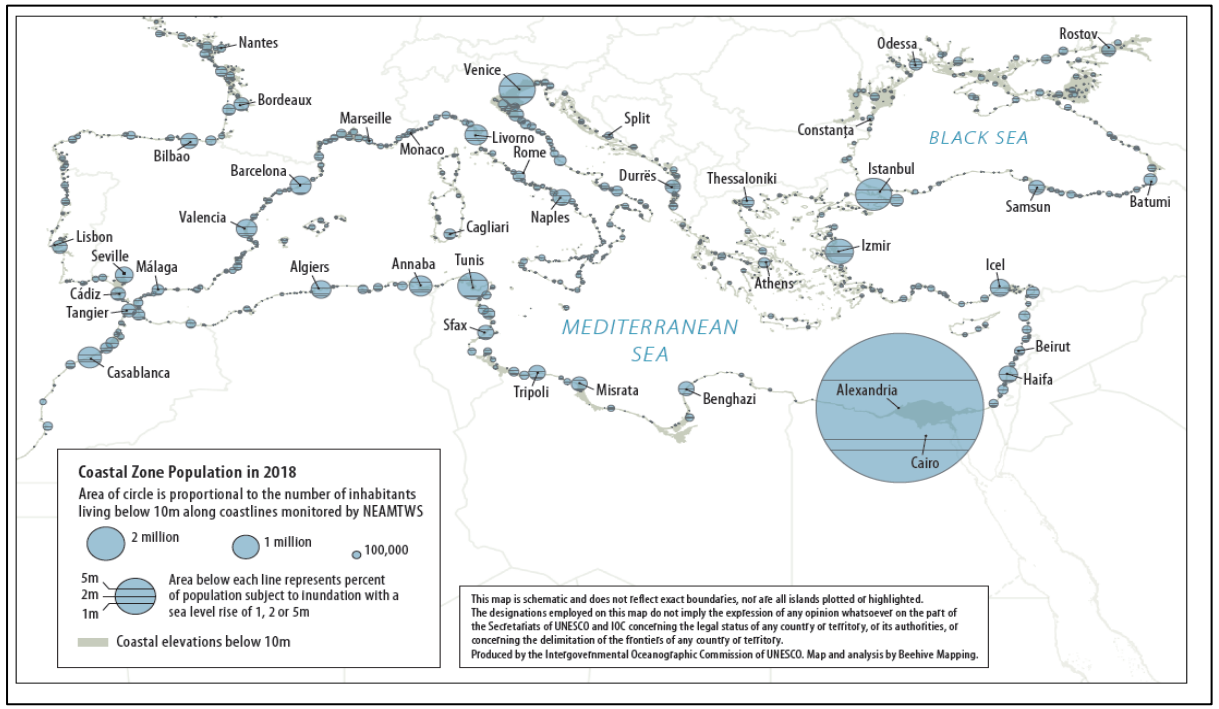


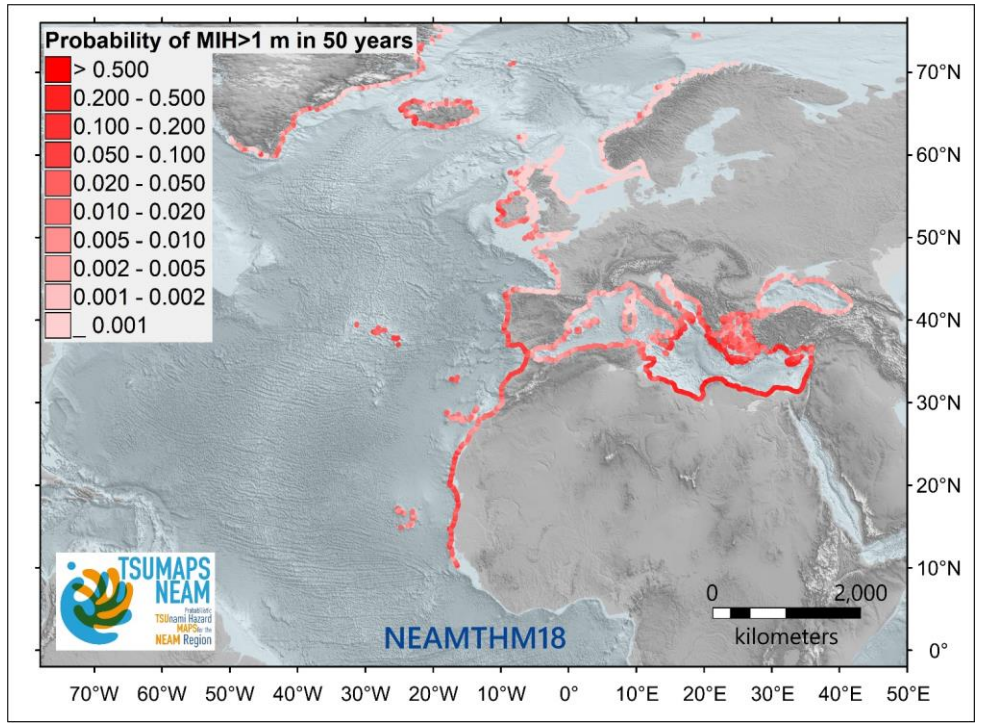


The Mediterranean is the **main tourist destination in the world**, with tourists arriving from all over the world.

Gaps & Challenges

Tsunami Hazard and Exposure in NEAM Region





116 millions below 10m height are exposed to coastal hazards !

Tsunami is a low frequency, high consequence and impact coastal hazard.

The probability of an EQ-generated tsunami exceeding MIH = 1 m in 30-50 years

(NEAMTHM18; Basili et al., 2021)

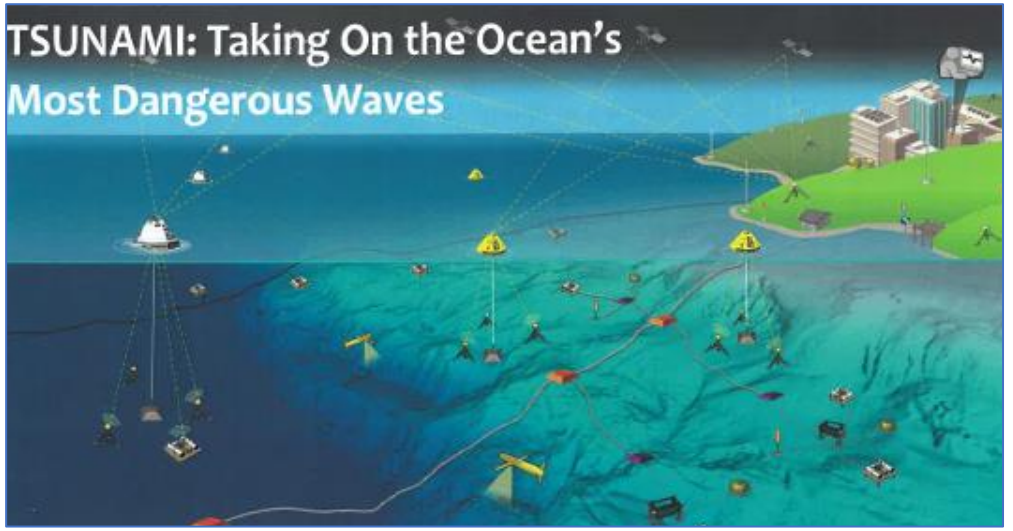
Transformative Tsunami Early Warning & Mitigation System

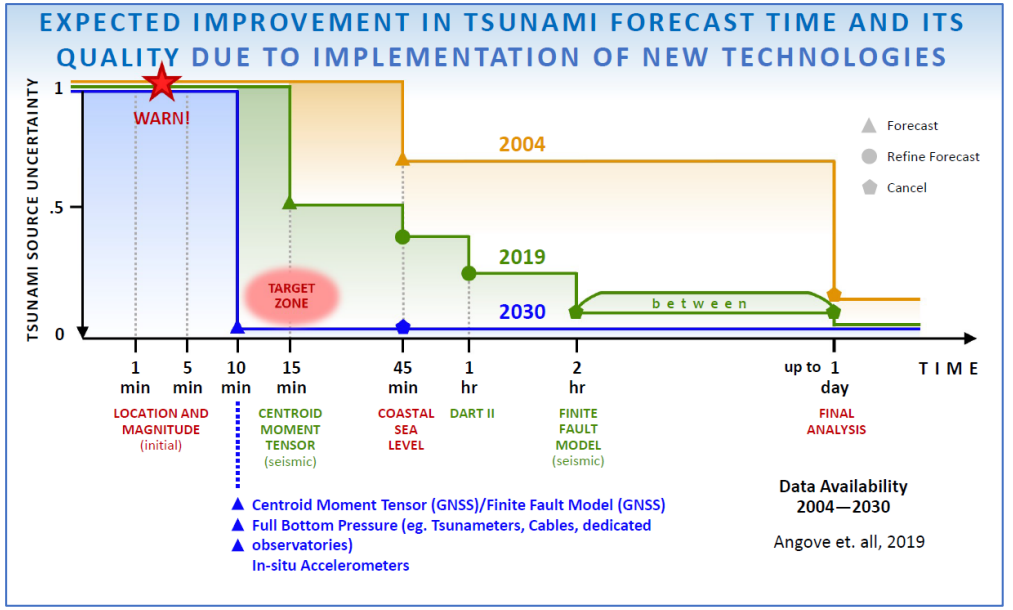
Resilience and Safer Coasts

Ocean Decade Tsunami Programme

- A **10-Year Research, Development and Implementation Plan** for the new Ocean Decade Tsunami Programme.

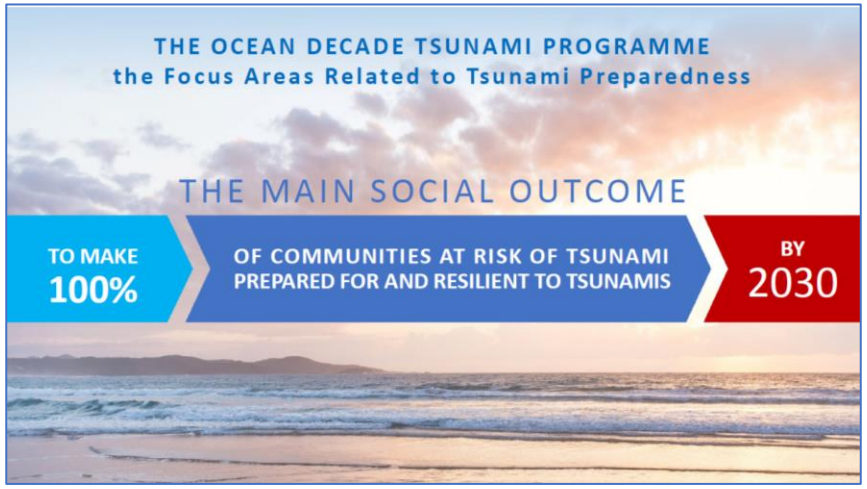
- Transformational advances in tsunami DRR from enhancing risk knowledge, detection, measurement and forecasting(non-seismic sources) to preparedness and response .





UN Ocean Decade Tsunami Programme

- 100% of communities at risk of tsunami prepared for and resilient to tsunamis by 2030 through the implementation of the UNESCO IOC Tsunami Ready Recognition Programme and other initiatives.
- UNESCO IOC Tsunami Ready Recognition. 12 Indicators
- Key contribution to achieving the societal outcome ‘A Safe Ocean’ of the Ocean Decade.
- Endorsed at IOC EC-55, June 2022
- Establishment of the scientific committee for the Ocean Decade Tsunami Programme
- International coalition on Tsunami
- New teams formed on volcano and meteotsunamis



Tsunami Ready

ICG/NEAMTWS 2030 Strategy

STRATEGIC PILLARS AND OBJECTIVES

PILLAR 1: TSUNAMI HAZARD AND RISK ASSESSMENT

- Implementation of probabilistic methodologies in tsunami hazard and risk assessment
- Member states to develop specific tsunami hazard and risk assessments for vulnerable national sub-regions
- Develop regional hazard assessment for landslide-generated tsunami
- Multi-source tsunami hazard assessment

PILLAR 2: DETECTION, WARNING AND DISSEMINATION

- Increase, densify and ensure sustainability of the seismic and sea-level detection networks, particularly to include regions/Member States with low coverage
- Realise installation of multi-hazard observations systems composed of co-located tide-gauge/accelerometer/GNSS sensors
- Plan and implement an "Inter-Operability Tool"
- Develop and implement additional monitoring tools
- Implement Probabilistic Tsunami Forecasting
- Threat levels
- Additional sources of tsunami observations

PILLAR 3: AWARENESS AND RESPONSE

- Understanding perceptions of coastal hazards and risks
- Arrange to publish and local authority awareness of tsunami and associated hazards and how to prepare to respond
- Develop tsunami-related curriculum programmes for all levels of education
- Develop and deliver suitable and sustainable capacity-building programmes to facilitate effective and efficient response and coordination
- Develop and maintain the NEAMTIC tsunami information website
- Establish rapid and effective evacuation mechanisms given the risk assessment guidance and data
- Develop and conduct regular exercises to test early warning systems and evacuation mechanisms
- Roll out the "Tsunami Ready" initiative in coastal communities

IOC UNESCO EU DG ECHO

CoastWAVE Project

Sep 2021-Mar. 2024

An ICG /NEAMTWS Project

AN ENDORSED UN OCEAN DECADE PROJECT

No. UN27

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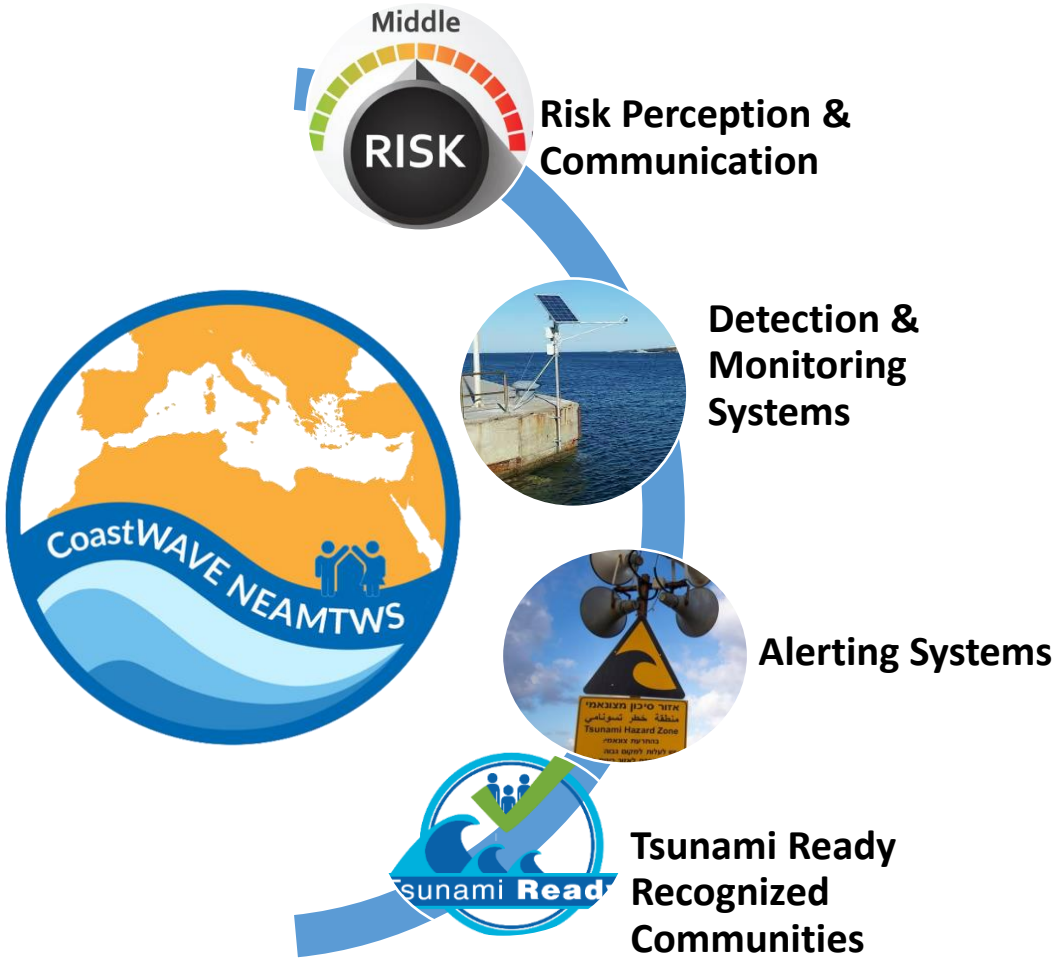
2021 2030 United Nations Decade of Ocean Science for Sustainable Development

Funded by European Union Humanitarian Aid

CoastWAVE NEAMTWS

IOC-UNESCO EU DG-ECHO
CoastWAVE PROJECT



Objectives:

- Adopt Global Tsunami Ready Standards and Guidelines and pilot Tsunami Ready at 7 communities in 7 countries within ICG/NEAMTWS.
- Supply and install tsunami detection and alerting equipment in selected NEAMTWS countries
- Evaluate the effectiveness, compatibility, performance, and benefits of the "Inexpensive Device for Sea Level" (IDSL) network in NEAMTWS countries

Expected Results:

- Enhance and scale-up actions though new technological detection, monitoring and alerting systems
- Risk Perceptions and Communication Strategies
- Seven UNESCO IOC Tsunami Ready Recognized Communities
- Sustainability framework for IDSL

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Reducing Risk and Building Resilience through Community Preparedness

TSUNAMI READY RECOGNITION PROGRAMME

12 TR INDICATORS

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Tsunami Ready

build resilient communities that will protect life, livelihoods, and property from tsunamis in different regions.

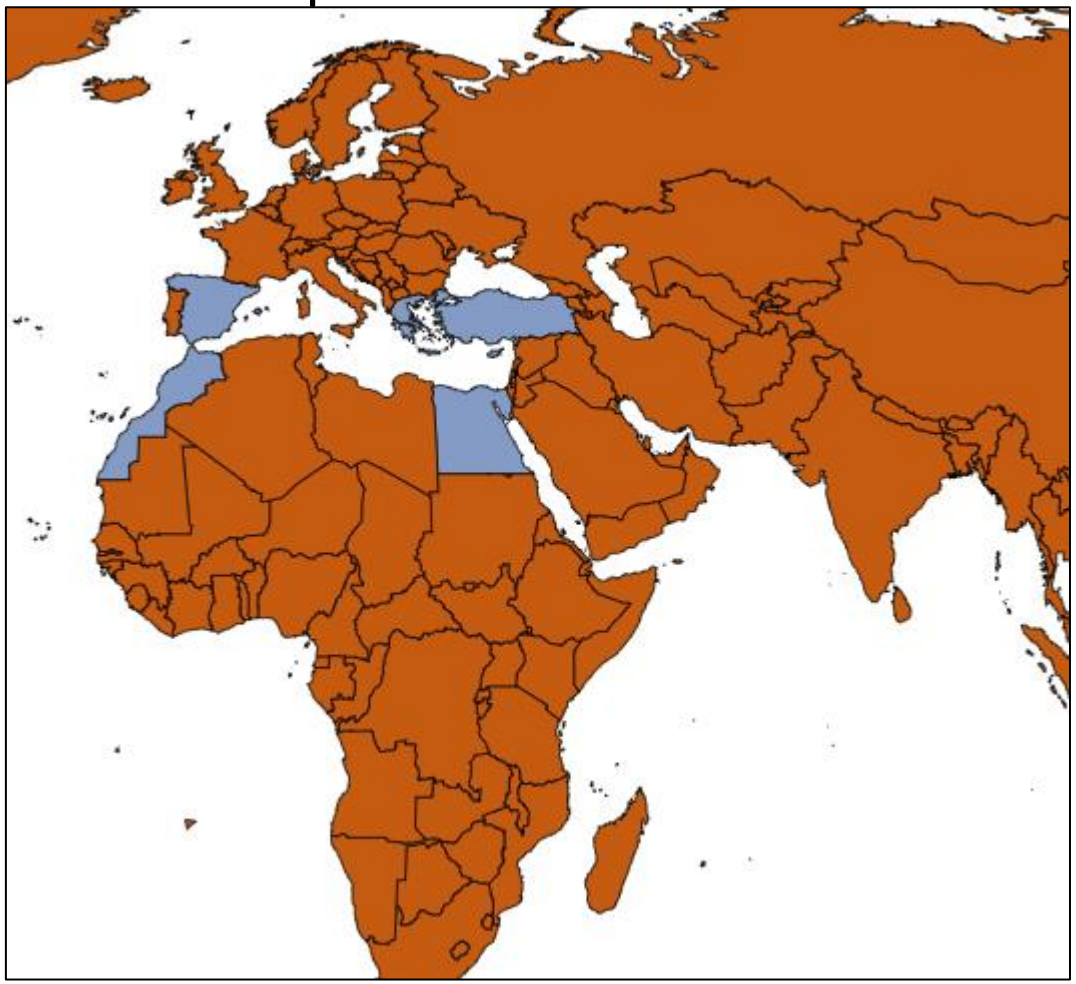
improve coastal community preparedness through a collaborative efforts on TR preparedness.

promote an understanding of the concept of readiness as an active collaboration among national and local warning and emergency management agencies and government authorities, scientists, community leaders, and the public.

	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 including signage is publicly displayed.
6	**PREP-3**. Outreach and public awareness and education resources are available and distributed.
7	**PREP-4**. Outreach or educational activities are held at least 3 times a year.
8	**PREP-5**: A community tsunami exercise is conducted at least every two years.
III	**RESPONSE (RESP)**
9	**RESP-1**. A community tsunami emergency response plan 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.

CoastWAVE PROJECT

Project Countries: Malta, Cyprus, Greece, Turkiye, Egypt, Morocco and Spain



Communities to be Recognized as Tsunami Ready

Seven UNESCO IOC Tsunami Ready Recognized Communities by the end of 2023.

CoastWAVE PROJECT

RISK PERCEPTION AND COMMUNICATION STRATEGIES

Multi-hazard Risk Perception Questionnaire in Cyprus, Malta, Morocco, Egypt and Spain

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Questionnaire focuses on 4 Target Groups:

Education

Tourism

Emergency responders

Public

Recommended methods of Implementation of the survey:

Booth/street surveys

Focus groups

Cati Surveys

Online surveys

Focus group

veys

DETECTION & MONITORING

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CoastWAVE NEAMTWS

DETECTION & MONITORING

NEAMTWS CURRENT NETWORK OF IDSLS

- Developed for tsunami hazard monitoring by EC-JRC
- 40 Inexpensive Device for Sea Level (IDSL) mareographs have been installed at NEAM (each ~2k Euros)
- Cheap and effective
- Long-term reliability is being tested
- Gap North African coasts

NEAMTWS Current JRC Network of Inexpensive Device for Sea-Level Measurement (IDSL) Devices *(map by JRC)*

- 40 devices in NEAM

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CoastWAVE NEAMTWS

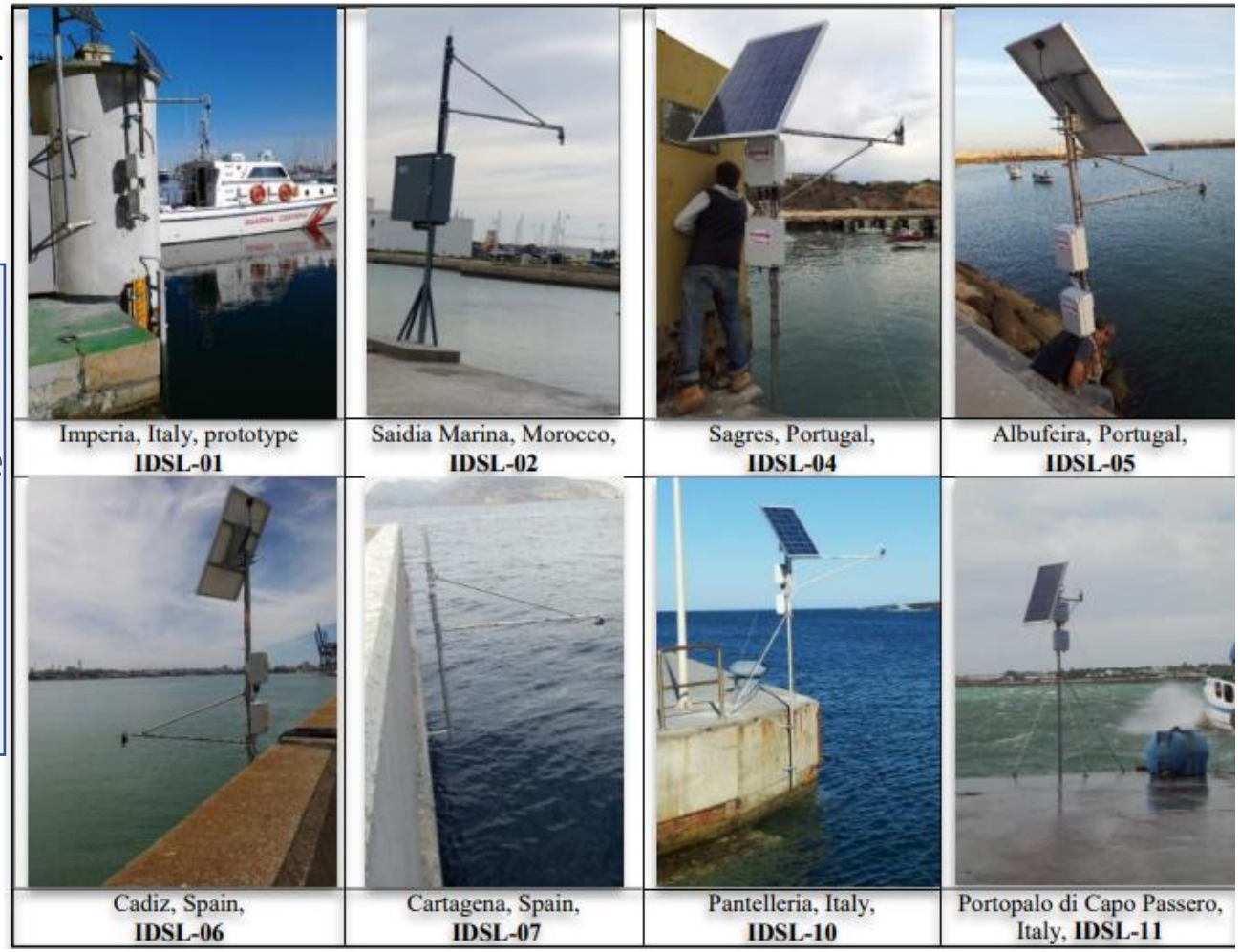
DETECTION & MONITORING

NEAMTWS CURRENT NETWORK OF IDSLS

in collaboration with IOC-UNESCO and EU DG ECHO EC-JRC

CoastWAVE Project Implementation

- Install new IDSLs in 4 countries
- Repair existing IDSLs in selected NEAM countries
- Evaluate its effectiveness, compatibility, performance and long-term sustainability
- Prepare maintenance programme and budget



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