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Information Workshop on NEAMTWS: Reducing Tsunami Risk through EWS, Preparedness and Awareness

The Governance, the Status and the
Architecture of the Tsunami Warning and
Mitigation System in the NEAM region

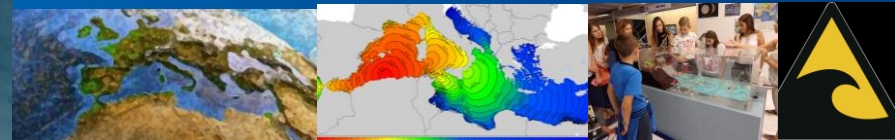
Dr Denis Chang Seng

ICG/ NEAMTWS Technical Secretary

Prof.Dr. Ahmet Cevdet & Yalciner

Chair UNESCO/ICG/NEAMTWS

25-26 September, Madrid, Spain





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Tsunami Programme

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PREPARATORY COMMISSION

North-eastern Atlantic and Mediterranean Home

The Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and connected seas (**ICG/NEAMTWS**) was formed in response to the tragic tsunami on 26 December 2004, in which over 250,000 lives were lost around the Indian Ocean region. The Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) received a mandate from the international community to coordinate the establishment of the System during the course of several international and regional meetings, including the World Conference on Disaster Reduction (Kobe, Japan, 18 – 22 January 2005), and the Phuket Ministerial Meeting on Regional Cooperation on Tsunami Early Warning Arrangements (Phuket, Thailand, 28 and 29 January 2005). The IOC Assembly, during its twenty-third Session (21-30 June 2005), formally established the ICG/NEAMTWS through Resolution IOC-XXIII-14. The guidelines for the NEAMTWS activities are compiled in the NEAMTWS Implementation Plan

NE Atlantic and Mediterranean Menu

- Tsunami Catalogue
- Structural elements of the TWS
 - Membership
- Guiding Documents
- Research Projects
- Assessment of capacities
- NEAMTIC

Officers

Chairperson

Ahmet Cevdet Yalciner (Middle East Technical University, Turkey): 2014-2015, 2016-2017

Vice-chairpersons

Anna Gylденfeldt (Federal Maritime and Hydrographic Agency, Germany): 2016-2017
Stefano Lorito (Istituto Nazionale di Geofisica e Vulcanologia, Italy): 2016-2017

Working Groups and Task Teams

The Intergovernmental Coordination Group meets regularly to establish and implement working plans in the NEAM region. To address specific technical issues (terms of reference) it has formed four

ICG/NEAMTWS

Establishment

ICG/NEAMTWS was formally established during the twenty-third IOC Assembly Session (21-30 June 2005) through Resolution IOC-XXIII-14

Purpose

To coordinate the establishment of the tsunami Early Warning System and its activities in NEAM region

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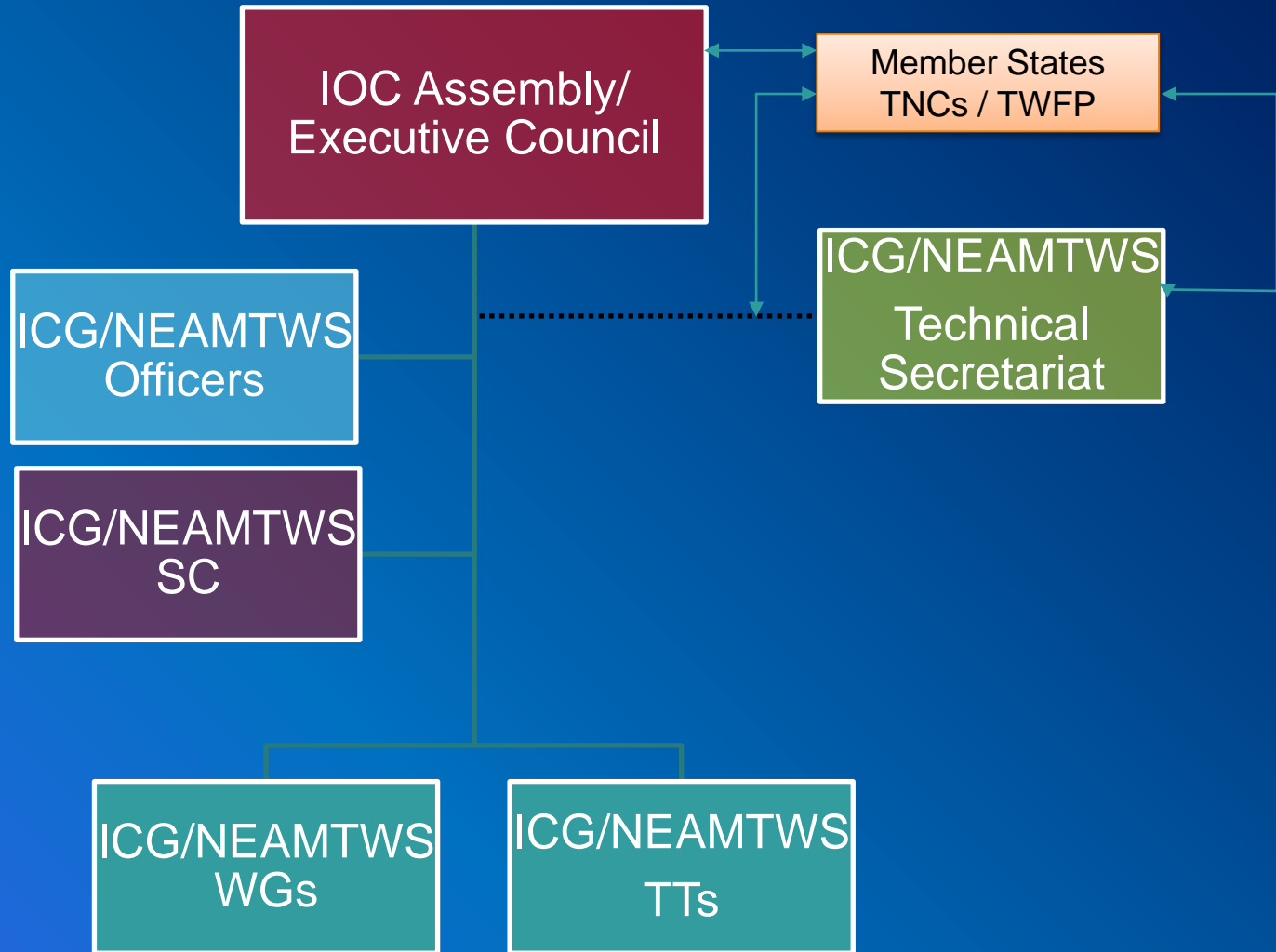
Member States

39 Member States

- | | |
|--------------|--------------------|
| Albania | Libya |
| Algeria | Malta |
| Belgium | Mauritania |
| Bulgaria | Monaco |
| Cape Verde | Morocco |
| Croatia | Netherlands |
| Cyprus | Norway |
| Denmark | Poland |
| Egypt | Portugal (NTWC) |
| Estonia | Romania (NTWC) |
| Finland | Russian Federation |
| France (TSP) | Slovenia |
| Georgia | Spain |
| Germany | Sweden |
| Greece (TSP) | Syria |
| Iceland | Tunisia |
| Ireland | Turkey (TSP) |
| Israel | Ukraine |
| Italy (TSP) | United Kingdom |
| Lebanon | |



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Stefano Lorito (Istituto Nazionale di Geofisica e Vulcanologia, Italy): 2016-2017

Technical Secretariat

IOC/UNESCO

Head of Tsunami Section

Thorkild Aarup

ICG/NEAMTWS Technical Secretary

Denis Chang Seng



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Technical Working Groups

There are four technical Working Groups (WGs):

- **Working Group 1 - Hazard Assessment and Modelling**

Co-chairs:

Mauricio González (University of Cantabria, Spain)

Jörn Behrens (University of Hamburg, Germany)

- **Working Group 2 - Seismic and Geophysical Measurements**

Co-Chairs:

Marinos Charalampakis (Institute of Geodynamics, National Observatory of Athens, Greece)

Alberto Michelini (National Institute of Geophysics and Volcanology, Italy)

- **Working Group 3 - Sea Level Data Collection and Exchange, Including Offshore Tsunami Detection and Instruments**

Chair:

Dov S. Rosen (NEMA, Israel)

- **Working Group 4 - Public Awareness, Preparedness and Mitigation**

Co-chairs:

Areti Plessa (Institute of Geodynamics, National Observatory of Athens)

Marzia Santini (Department for Civil Protection, Italy)



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Task Teams

Task Team on NEAMWave17

Co-chairs:

Ceren Ozer Sozdinler (Kandilli Observatory and Earthquake Research Institute, Turkey)

Eleonora Panunzi (Department of Civil Protection, Italy)

Task Team on Operations

Co-chairs:

François Schindele (CENALT, France)

Fernando Carrilho (Portugese Sea and Atmosphere Institute, Portugal)

Governance & Architecture-Cross Cutting Across ICGs

TOWS WG Task Teams



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•TOWS WG Task Team on Operations

François Schindele (CENALT, France)

Fernando Carrilho (Portugese Sea and Atmosphere Institute, Portugal)

•TOWS WG Task Team on Disaster Management and Preparedness

Gerassimos Papopoulos (Institute of Geodynamics, National Observatory of Athen)

Amir Yahav (National Emergency Management Authority, Israel)

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Accreditation of NEAMTWS Tsunami Service Providers (TSPs)



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Following an Accreditation process established by the ICGNEAMTWS, the ICG/NEAMTWS- XIII session in Bucharest, Romania, 26-28 September 2016 granted the status of NEAMTWS Tsunami Service Providers (TSP) to the following institutions:

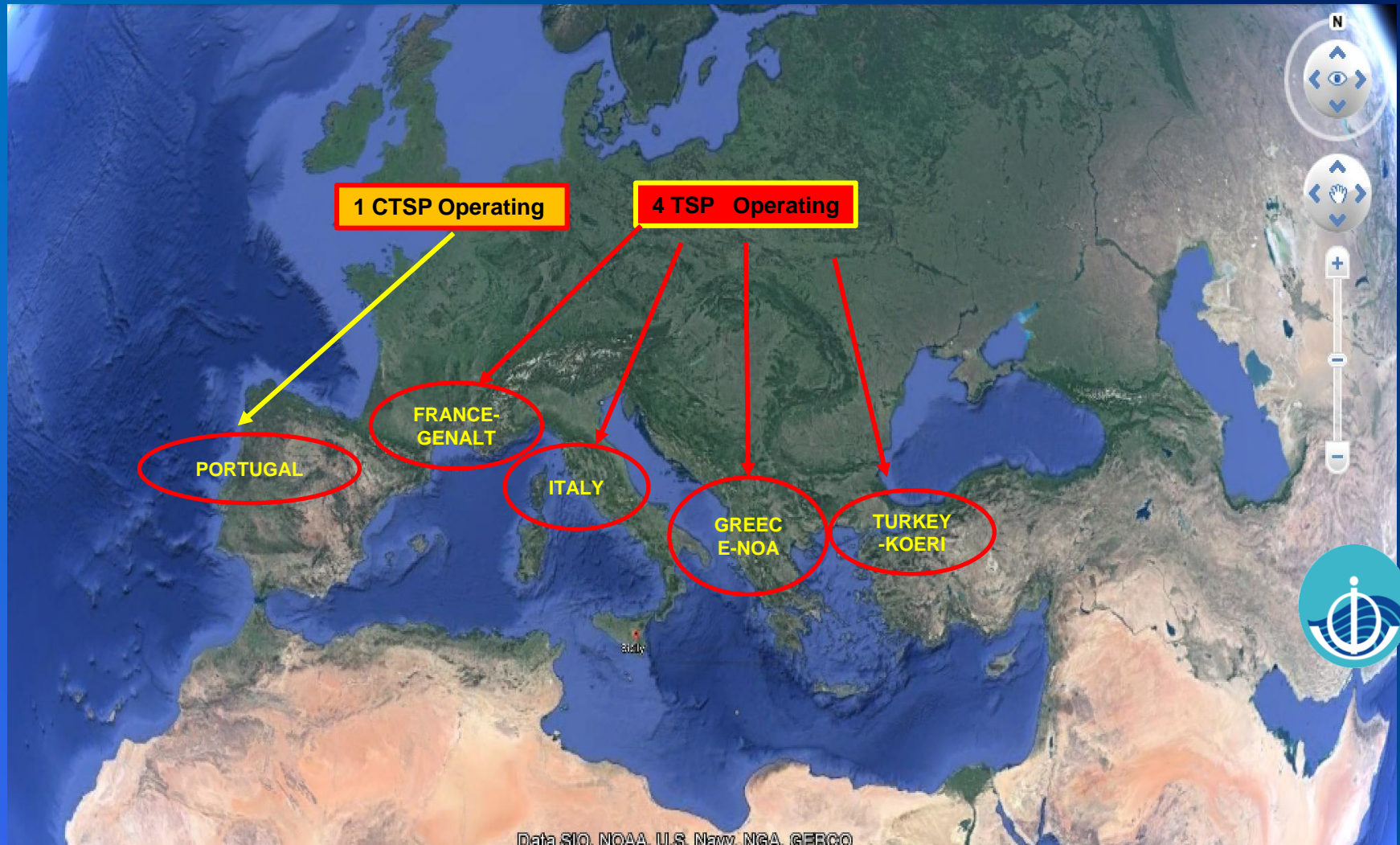
1. **CENALT – Centre national d'alerte aux tsunamis (France)**
2. **NOA-Institute of Geodynamics, National Observatory of Athens (Greece)**
3. **INGV-Centro Nazionale Terremoti, Istituto Nazionale di Geofisica e Vulcanologia (Italy)**
4. **KOERI-Kandilli Observatory and Earthquake Research Institute (Turkey)**

Portugal and Romania to start their National Tsunami Warning Centers during 2017.



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Tsunami Service Providers (TSPs)



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IOC-UNESCO ICG-TWS Regional Tsunami Service Providers



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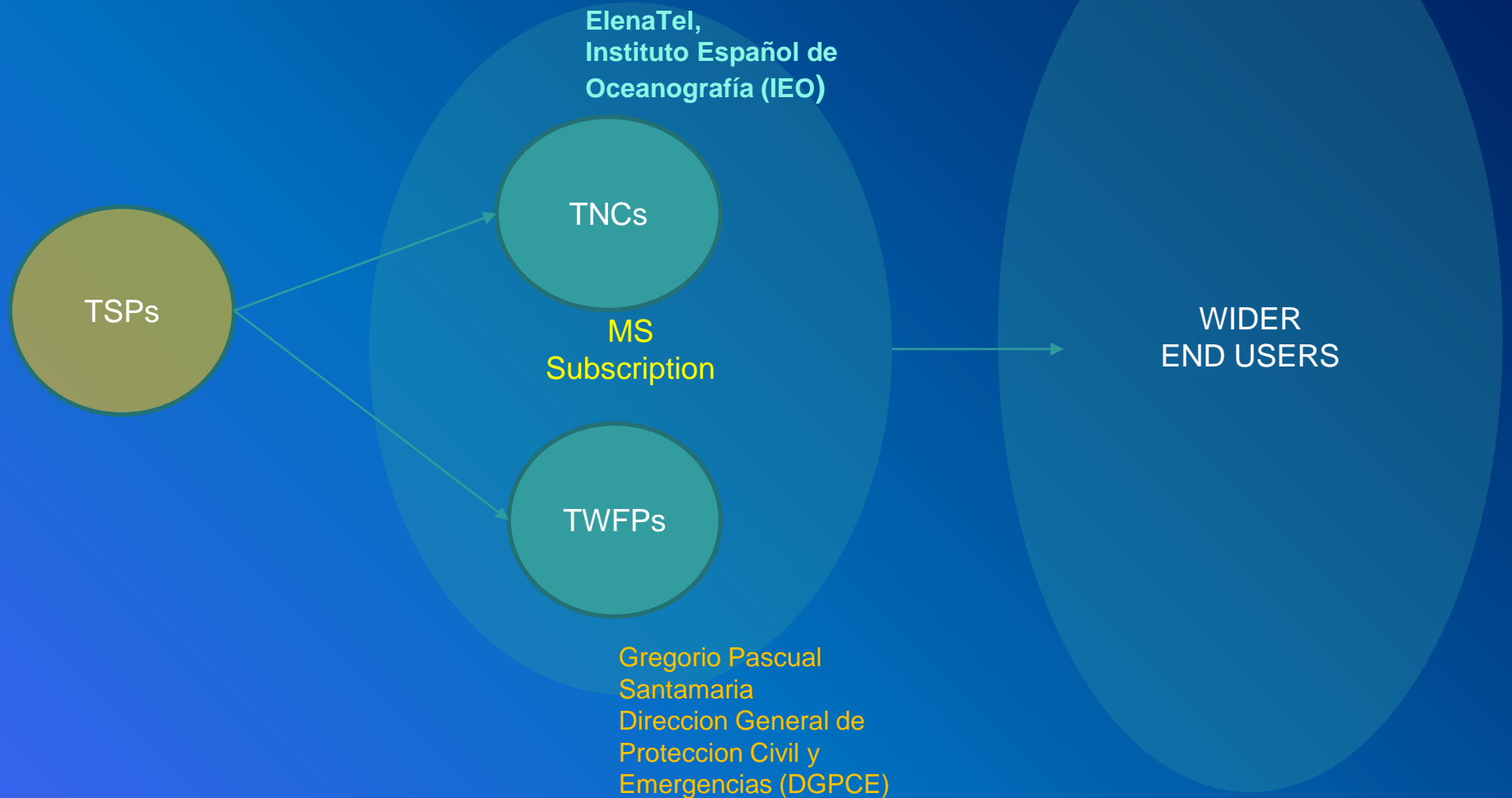


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7 New TSPs established since 2004 IO Tsunami

Governance & Architecture Tsunami Information Chain



Seismic Network

- In Europe alone, there are currently more than 1000 broadband seismic stations operating.
- At least 50% of these are available in real-time through various transmission means.
- For the purpose of NEAMTWS it is important to ensure the availability of geographically balanced seismic station coverage.



Sea Level Network

- Sea Level stations have increased from 15 in 2007 to 185 in 2015
- Gaps exist particularly South of Mediterranean

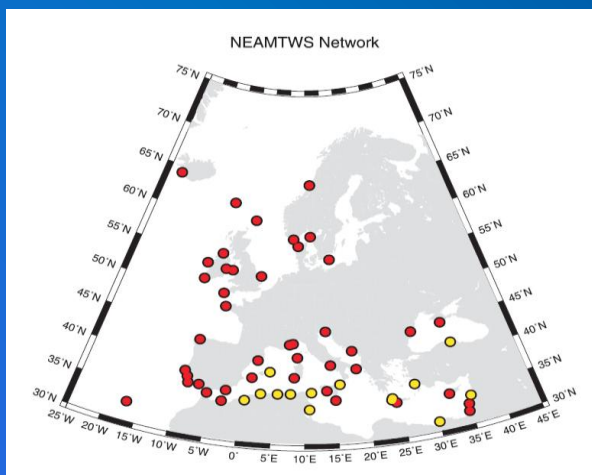
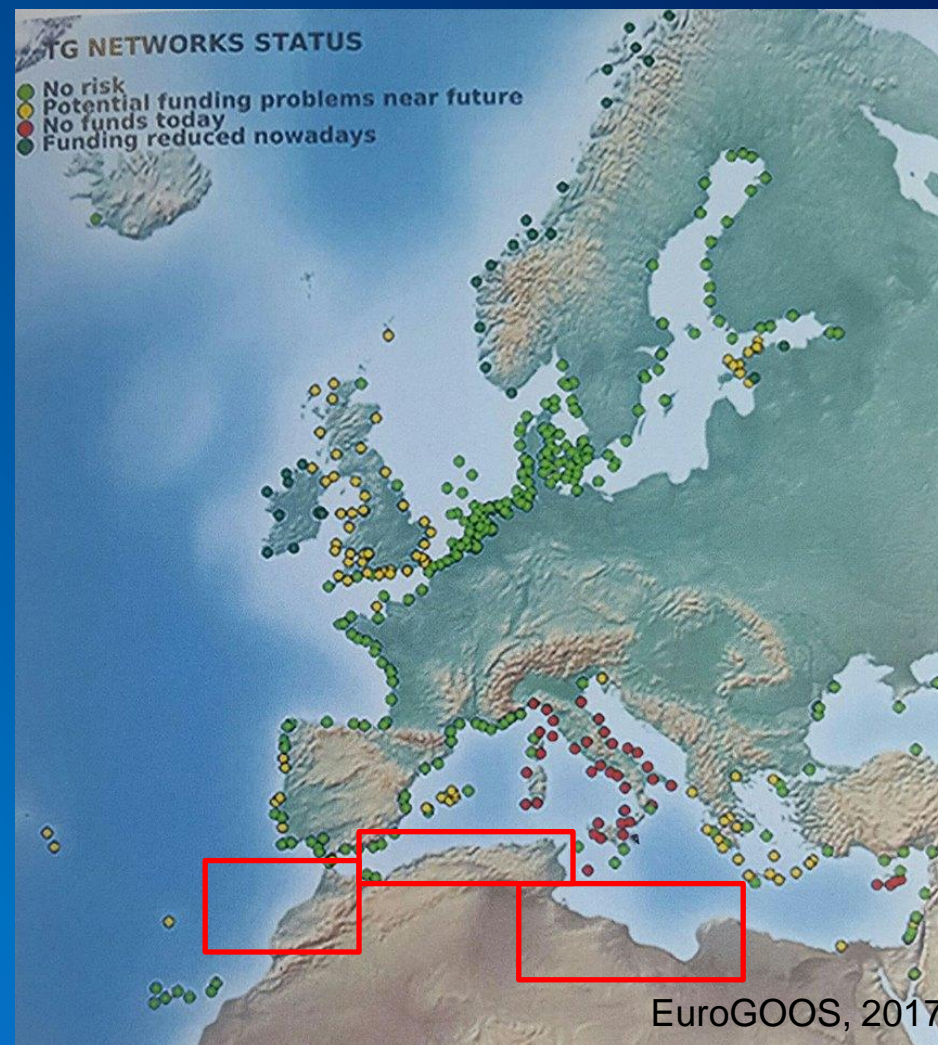


Fig. 4. The NEAMTWS tsunami network proposed to be operational in the near future. Red sites indicate stations with an existing tide gauge (of any type) while yellow sites indicate that new installations are required.





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Tsunami Information Meetings

The TSUMAPS-NEAM Project Final Meeting

TSUMAPS-NEAM is a project funded by the European Commission under the auspices of the Directorate General of the European Civil Protection and Humanitarian Aid Operations (DG-ECHO)

Location: Tunis, Tunisia

Date: 11-12 September 2017

Final meeting aims to present the first homogeneous region-wide long-term **Probabilistic earthquake-induced Tsunami Hazard Assessment (PTHA)** for the coastlines of the NEAM region to all potential stakeholders.

IOC UNESCO Information Meeting on NEAMTWS: Reducing Tsunami Risk through Early Warning System, Preparedness and Awareness

Location: Tunis, Tunisia

Date: 13 - 14 September 2017

Meeting is planned to maximize the dissemination of information related to the awareness, preparedness, and mitigation of tsunami risk.

Information Meeting on NEAMTWS: Reducing Tsunami Risk through Early Warning System, Preparedness and Awareness

Location: Madrid, Spain

Date: 25 - 26 September 2017



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10th Anniversary of NEAMTWS

Publication Booklet

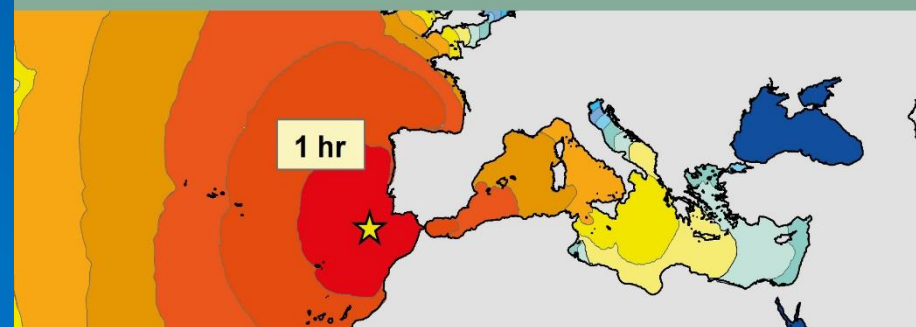
10 Years of the North-Eastern Atlantic, the Mediterranean and Connected Seas Tsunami Warning and Mitigation System (NEAMTWS):

Accomplishments and Challenges in Preparing for the Next Tsunami



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



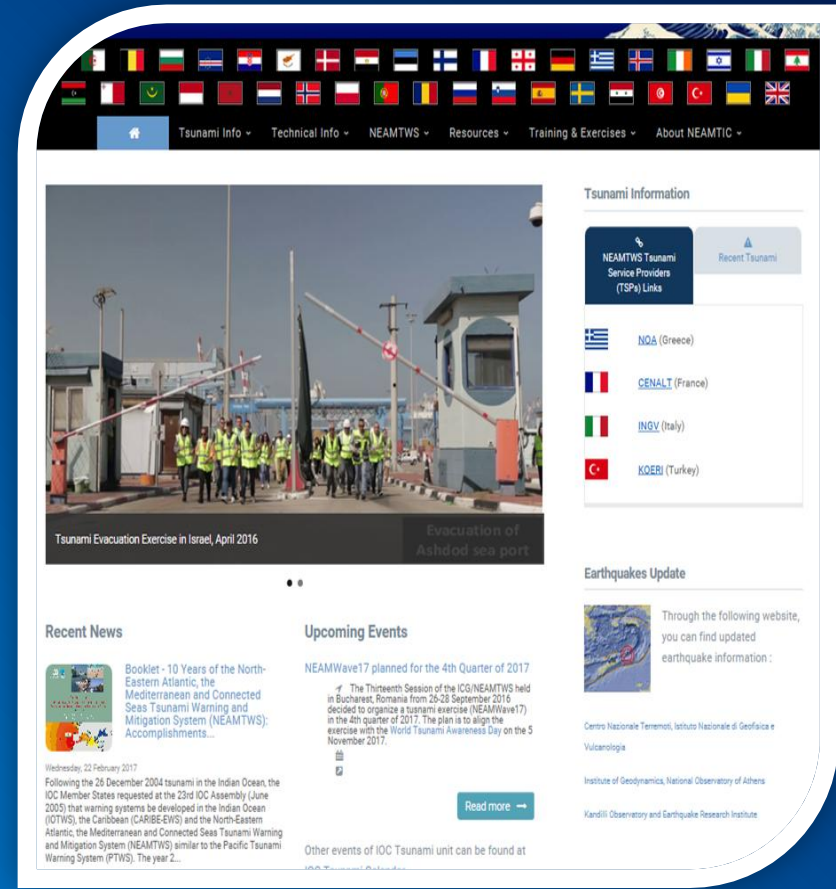
NEAM Tsunami Information Centre (NEAMTIC)

• **NEAM Tsunami Information Centre (NEAMTIC)** was established to provide information on **warning systems, risks** and **good practices** in respect of tsunamis and other sea-level related hazards

• Users include:

- CPAs
- Disaster Management organizations
- Decision makers
- schools
- industries in the coastal zone
- General public.

• NEAMTIC supports the development of the NEAMTWS.





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NEAMTWS Participation in TOWS-X Meeting Tsunamis and Other Hazards Related to Sea- Level Warning and Mitigation Paris, 25-26 February 2016 and 23-24 February 2017





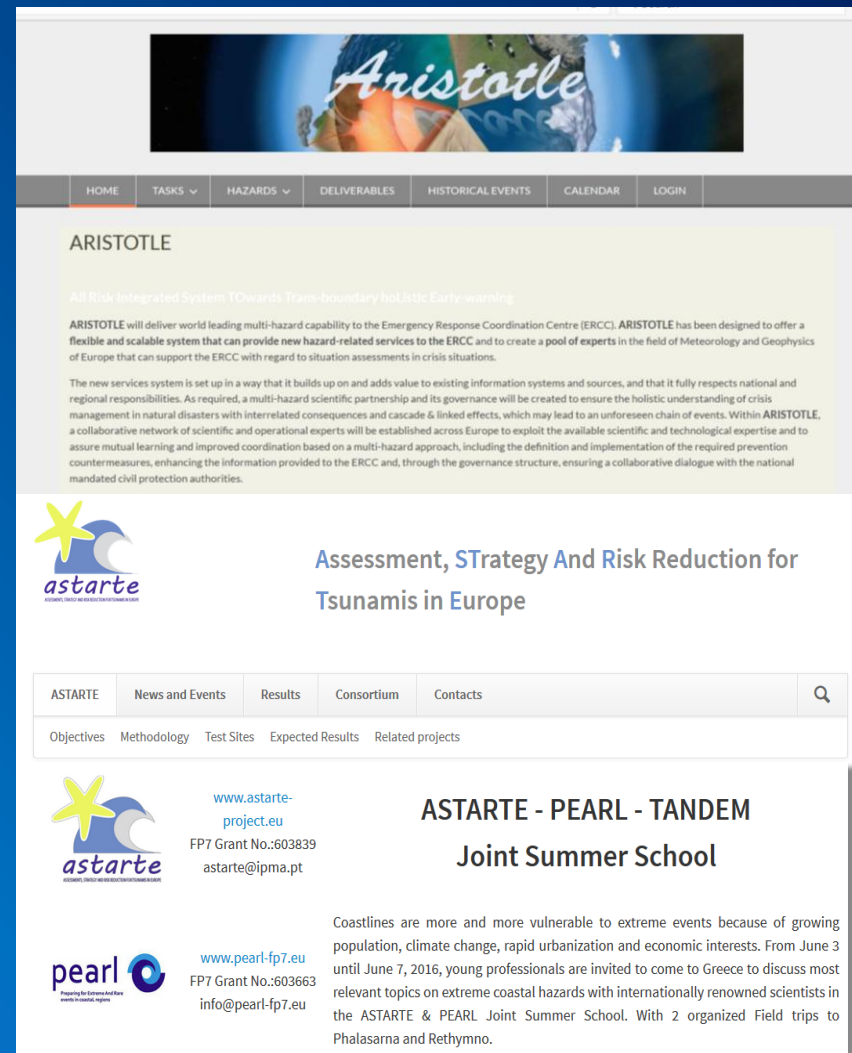
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NEAMTWS Related EU Funded Projects

- **ARISTOTLE** (All Risk Integrated System Towards Trans-Boundary Holistic Early-warning) pilot project which started in 2015 in the area of Early Warning System for natural disasters. It is a multi-hazard scientific partnership for Early Warning Services. It is designed to deliver world leading multi-hazard capability to the Emergency Response Coordination Centre (ERCC).
- **ASTARTE** (Assessment, Strategy, and Risk Reduction for Tsunami in Europe) project. It is a three-year project ending in 2016. There are 26 partners from 16 countries.



The screenshot shows the ARISTOTLE project website. At the top, there is a banner with the word "Aristotle" in a stylized font over a globe. Below the banner is a navigation menu with links for HOME, TASKS, HAZARDS, DELIVERABLES, HISTORICAL EVENTS, CALENDAR, and LOGIN. The main content area features the ARISTOTLE logo and a description of the project as an "All Risk Integrated System Towards Trans-Boundary Holistic Early-warning". It states that ARISTOTLE will deliver world leading multi-hazard capability to the Emergency Response Coordination Centre (ERCC) and create a pool of experts in the field of Meteorology and Geophysics of Europe. Below this, there is a section for "Assessment, Strategy And Risk Reduction for Tsunamis in Europe" with the Astarte logo. A navigation bar includes links for ASTARTE, News and Events, Results, Consortium, and Contacts. Below this, there are links for Objectives, Methodology, Test Sites, Expected Results, and Related projects. The bottom section features the Astarte logo and contact information for the "ASTARTE - PEARL - TANDEM Joint Summer School", including the website www.pearl-fp7.eu, the FP7 Grant No.:603663, and the email info@pearl-fp7.eu. The text describes the summer school as an opportunity for young professionals to discuss topics on extreme coastal hazards with internationally renowned scientists in the ASTARTE & PEARL Joint Summer School, with 2 organized field trips to Phalassara and Rethymno.



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NEAMTWS Related EU Funded Projects

- **TSUMAPS-NEAM** (Probabilistic Tsunami Hazard Maps for NEAM) project; a co-funded project of the European-Union Civil Protection Mechanism. TSUMAPS-NEAM will provide the NEAMTWS region with the first community-based and homogeneous region-wide probabilistic tsunami hazard assessment.
- The duration of the project is **18+3** months from **January 2016** to the end of **September 2017**.

• GLOBAL TSUNAMI MODEL GTM

- Network for increased understanding of tsunami hazard and risk
- Towards integrating, standardizing, and harmonizing work on tsunami hazard and risk

The screenshot shows the TSUMAPS-NEAM website interface. At the top left is the TSUMAPS-NEAM logo, which includes the text 'TSUMAPS NEAM' and 'Probabilistic Tsunami Hazard Maps for the NEAM Region'. To the right is the European Union flag with the text 'Funded by European Union Humanitarian Aid and Civil Protection'. Below the header is a navigation menu with items: 'ABOUT TSUMAPS-NEAM', 'WHAT WE DO', 'NEWS', 'EVENTS', 'TSUNAMI GLOSSARY', and 'CONTACT US'. The main content area features a grid of news articles. The largest article is titled 'New Study Ranks Hazardous Asteroid Effects From Least to Most Destructive' with a date of June 3, 2017. Other smaller articles include 'ITS 2017 - International Tsunami Symposium' (June 3, 2017), 'New Study Ranks Hazardous Asteroid Effects From Least to Most Destructive' (April 25, 2017), 'Wall Street algorithm helps scientists track 'slow slip' earthquakes' (April 5, 2017), and 'First Came a 'Catastrophic Collapse', Then a Tsunami' (March 24, 2017).

The screenshot shows the website for the Global Tsunami Model (GTM) network. At the top, there is a row of logos for partner organizations: NGI, INGV, GFZ, ipizz a, and USGS. Below the logos is the main heading: 'A Global Tsunami Model (GTM) network for increased understanding of tsunami hazard and risk'. Underneath is a list of names: 'Lehnhoff F¹, Harbitz CB¹, Griffin J¹, Davies G¹, Cummins P¹, Lorito S¹, Selva J¹, Basili R¹, Baptista MM¹, Babeyko A¹, Geist E¹, Parsons T¹, Thio HH¹, Leveque R¹, Power W¹, Burbridge D¹, Mueller C¹, Hargrave M¹, Wallace A¹, Ranogaj U¹, Suppasit A¹, Imamura F¹, Aguirre Ajerbe J¹, Gonzalez-Bianchi J¹, Gonzalez M¹, Van Wyk W¹, van Hellevoort-Andrade C¹, Mecca J¹, Gonzalez-Vida JM¹, Gallier A¹, Necmisluglu D¹, Lynett P¹, Paris R¹, Carlotta O¹, Bernal G¹ et al¹'. Below the names is a paragraph of text: 'Abstract: The 2004 Indian Ocean and 2011 Tohoku tsunamis highlighted the need for a thorough understanding of the risk posed by relatively infrequent but disastrous tsunamis. The latest Global Assessment Report (GAR15) resulted in fully global probabilistic tsunami hazard and risk maps, briefly presented here. Still, this complex assessment needs improvements based on the state-of-the-art research, e.g. in the treatment of uncertainty or inclusion of non-seismic tsunami sources, and in vulnerability and risk assessment. Towards implementing the Sendai Framework of Disaster Risk Reduction (SDFRR), further efforts are needed, requiring interdisciplinary expertise. We are therefore establishing a Global Tsunami Model (GTM) with the aim of i) a better understanding of tsunami hazard and risk analysis on a global scale and ii) providing a portfolio of validated tools for tsunami hazard and risk assessment at different scales.' At the bottom, there is a section titled 'GTM - towards integrating, standardizing, and harmonizing work on tsunami hazard and risk' with sub-sections 'What is GTM?' and 'GTM General Objectives'.



Challenges and Opportunities

Risk Knowledge

A holistic assessment of tsunami hazard and risk in the NEAM region, as a basis for long term risk mitigation planning, and as a tool for evacuation planning in case of a tsunami warning

Monitoring, warning and forecast

- **Improved Real Time Detection.** Increased efforts to maintain and improve real time seismic and sea level observing networks ensuring a more uniform coverage around the NEAM region.



Challenges and Opportunities (Con't)

Dissimination and communication of risk and information

- *Clear and Simple Message.* The NEAMWave exercise has shown that there is a need to further simplify the message distributed by TSPs.
- This will further improve the information flow to the end users.
- Provide tsunami information to maritime communities (Shipping)



Challenges and Opportunities (Con't)

Response capability

- CPA and Actors Understanding of TEWS. NEAMTWS activities need to focus on providing civil protection personnel in all member states with a basic understanding of the early warning elements and features of NEAMTWS.
- Ability to Respond to rare & potentially devastating event. The procedures for evacuation planning and the need for Civil Protection organizations to demonstrate and maintain a capability to respond effectively to a rare, though possibly devastating event by carrying out regular drills and exercise.





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Challenges and Opportunities (Con't)

NEAMTWS Sustainability

- TEWS rooted within the communities at risk
- Broader participation of stakeholders and partners
- Projects –Downstream and Inclusive
- Education and Awareness



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Up-coming Activities

- **NEAMWave17 exercise** has been prepared by NEAMTWS team and it will be held between **31st October to 3 November 2017**, with the participation of five tsunami message providers (France, Greece, Italy, Portugal and Turkey) prior to the World Tsunami Awareness Day (5 November 2017)
- **ICGNEAMTWS XIV**, Lisbon, Portugal 21-23 Nov 2017





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SPECIAL THANKS

END

Data: SIO, NOAA, U.S. Navy, NGA, GEBCO