

# ICG/NEAM Tsunami Warning and Mitigation System Status, Achievements and Challenges

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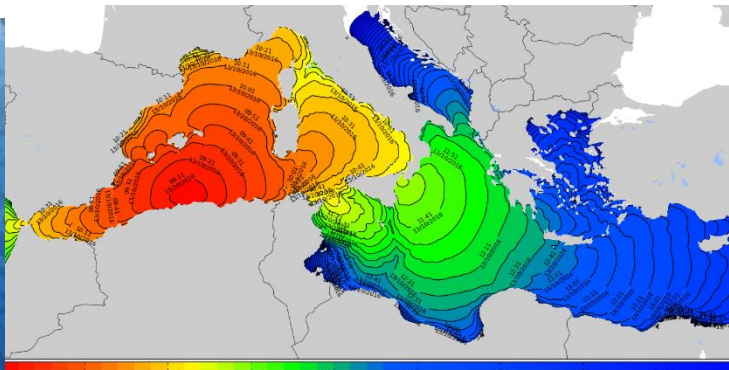
**Intergovernmental Oceanographic Commission of UNESCO**

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**Acknowledgement to Prof Ahmet Yalciner, Chair ICG/NEAMTWS and**

**François Schindelé, CENALT**

**MBSHC, Herceg Novi, Montenegro 5 July 2017**



# 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 has a **staff of 62 people** (42 at HQ and 20 in the field), P+G staff
- 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



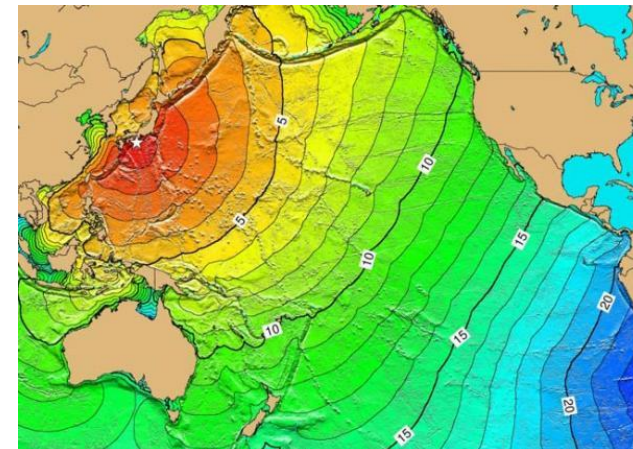
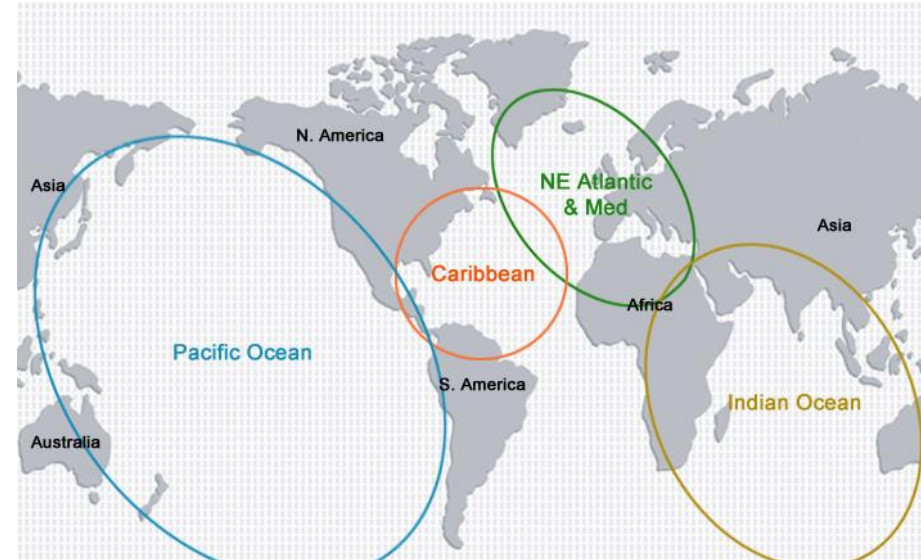
## *Vision*

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**

# 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



# 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



The screenshot shows the website for the Intergovernmental Oceanographic Commission (IOC) Tsunami Programme, specifically the North-eastern Atlantic and Mediterranean Home page. The page features a navigation menu with categories like Education, Natural Sciences, Social & Human Sciences, Culture, and Communication & Information. The main content area includes a welcome message, a description of the ICG/NEAMTWS, and a list of officers and working groups. A sidebar on the left contains a menu with options like Newsletter, Home, About Us, News, Regional Coordination, Caribbean, and Indian Ocean. A search bar is located at the top right, and a language selection menu is at the top center.

UNESCO.org Education Natural Sciences Social & Human Sciences Culture Communication & Information

Intergovernmental Oceanographic Commission  
Tsunami Programme

You are here: You are here: Home > North-eastern Atlantic and Mediterranean English Français Español Русский Search..... Search Advanced

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

North-eastern Atlantic and Mediterranean

- TWFPs
- TNCs

Pacific Ocean

- People & Teams
- TWFPs & TNCs
- Documents
- Calendar
- Contact Us

Sea Level Monitoring

CTBTO  
PREPARATORY COMMISSION

Officers

Chairperson

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

Vice-chairpersons

Anna Gyldenfeldt (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

# 10-Year 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**



# Candidate Tsunami Service Providers

- Since August 2012, three National Tsunami Warning Centres, France, Greece and Turkey, have become operational CTSP (providing watch services to other ICG/NEAMTWS Member States)
- In September 2014, the Italian National Tsunami Warning Centre was also acting as Candidate Tsunami Service Provider



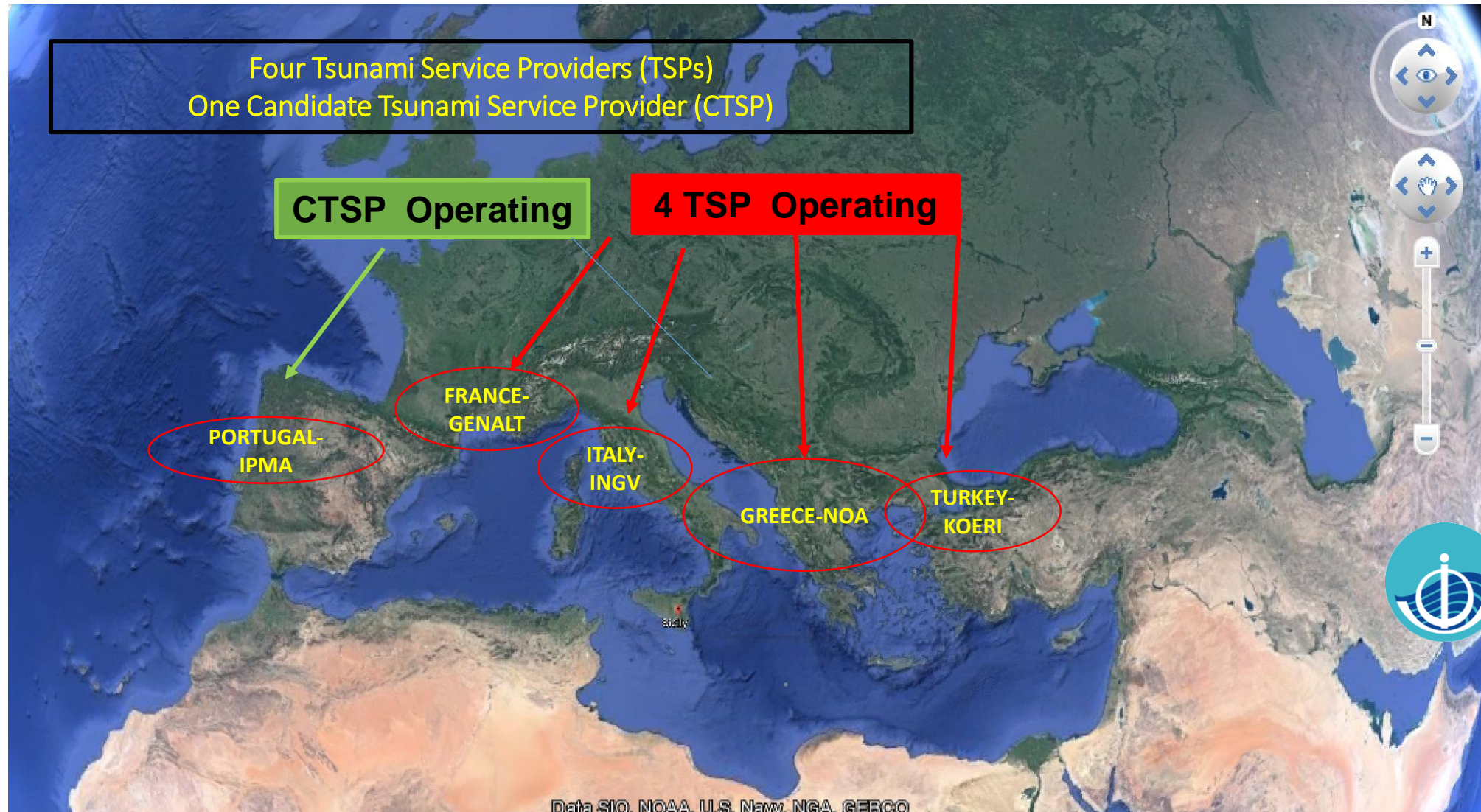
# Accreditation of NEAMTWS Tsunami Service Providers (TSPs)

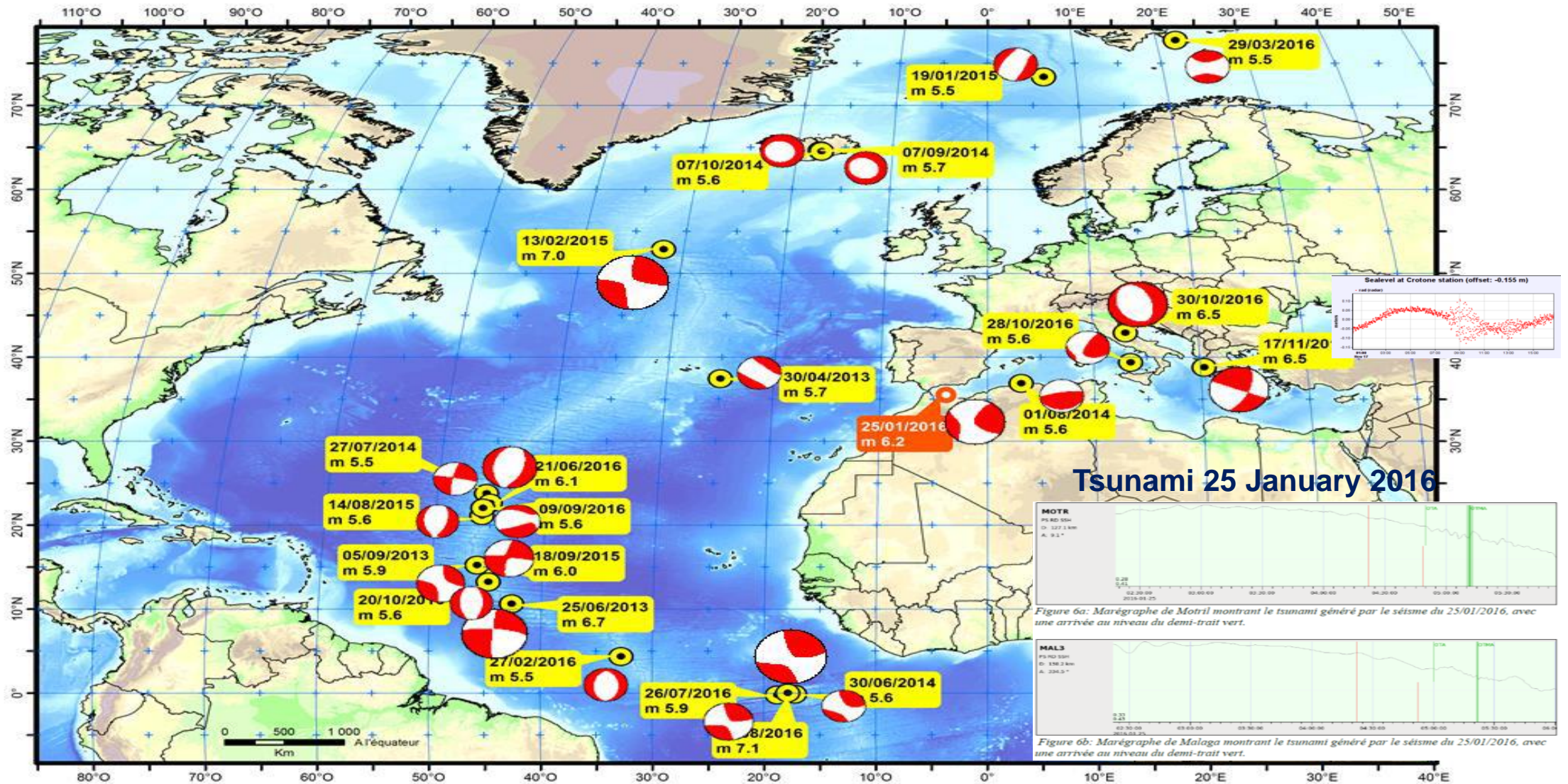
- Following an Accreditation process established by the ICGNEAMTWS, the ICG/NEAMTWS- XIII session in Bucharest, Romania, 26-28 September 2016 granted the status of NEAMTWS Tsunami Service Providers (TSP) to the following institutions:
  - 1) CENALT – Centre national d'alerte aux tsunamis (**France**)
  - 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 are expected to start their National Tsunami Warning Centers during 2017.



Four Tsunami Service Providers received Certificate of Accreditation at the 29<sup>th</sup> Session of the Intergovernmental Oceanographic Commission (IOC) Assembly, 27 June 2017

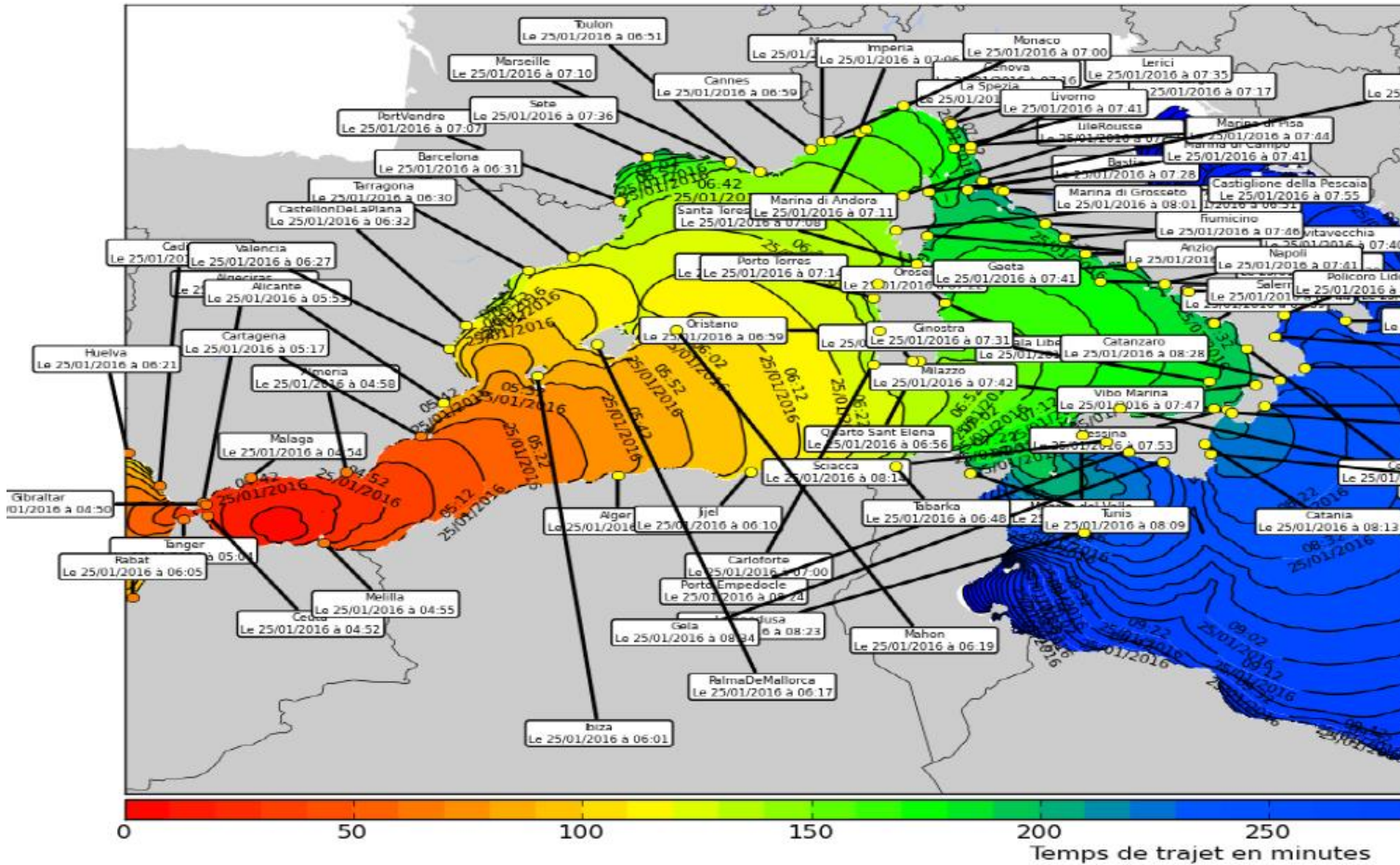
# Intergovernmental Coordination Group for the Tsunami Early Warning and Mitigation System in the North Eastern Atlantic, the Mediterranean and connected Seas (ICG/NEAMTWS)





# TSUNAMI WARNING 2012-2016

# Event 25 January 2016



AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS  
 ORIGIN TIME - 0422Z 25 JAN 2016  
 COORDINATES - 35.53 NORTH 3.81 WEST  
 DEPTH - 10 KM  
 LOCATION - STRAIT OF GIBRALTAR  
 MAGNITUDE - 6.2

### EVALUATION OF TSUNAMI ADVISORY

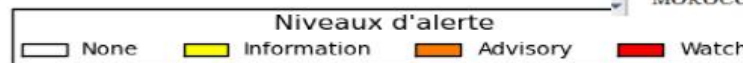
IT IS NOT KNOWN THAT A TSUNAMI WAS GENERATED. THIS WARNING IS BASED ONLY ON THE EARTHQUAKE EVALUATION. AN EARTHQUAKE OF THIS SIZE HAS THE POTENTIAL TO GENERATE A TSUNAMI THAT CAN STRIKE COASTLINES WITH A WAVE HEIGHT LESS THAN 0.5M AND/OR CAUSE A TSUNAMI RUN-UP LESS THAN 1M. AUTHORITIES SHOULD TAKE APPROPRIATE ACTION IN RESPONSE TO THIS POSSIBILITY. THIS CENTER WILL MONITOR SEA LEVEL DATA FROM GAUGES NEAR THE EARTHQUAKE TO DETERMINE IF A TSUNAMI WAS GENERATED AND ESTIMATE THE SEVERITY OF THE THREAT. A TSUNAMI IS A SERIES OF WAVES AND THE FIRST WAVE MAY NOT BE THE LARGEST. TSUNAMI WAVE HEIGHTS CANNOT BE PREDICTED AND CAN VARY SIGNIFICANTLY ALONG A COAST DUE TO LOCAL EFFECTS. THE TIME FROM ONE TSUNAMI WAVE TO THE NEXT CAN BE FIVE MINUTES TO AN HOUR, AND THE THREAT CAN CONTINUE FOR MANY HOURS AS MULTIPLE WAVES ARRIVE.

### EVALUATION OF TSUNAMI INFORMATION

BASED ON HISTORICAL EARTHQUAKE AND TSUNAMI MODELLING THERE IS NO THREAT THAT A TSUNAMI HAS BEEN GENERATED THAT CAN CAUSE DAMAGE OR MAJOR EFFECT IN THE REGION. THIS MESSAGE IS FOR INFORMATION ONLY.

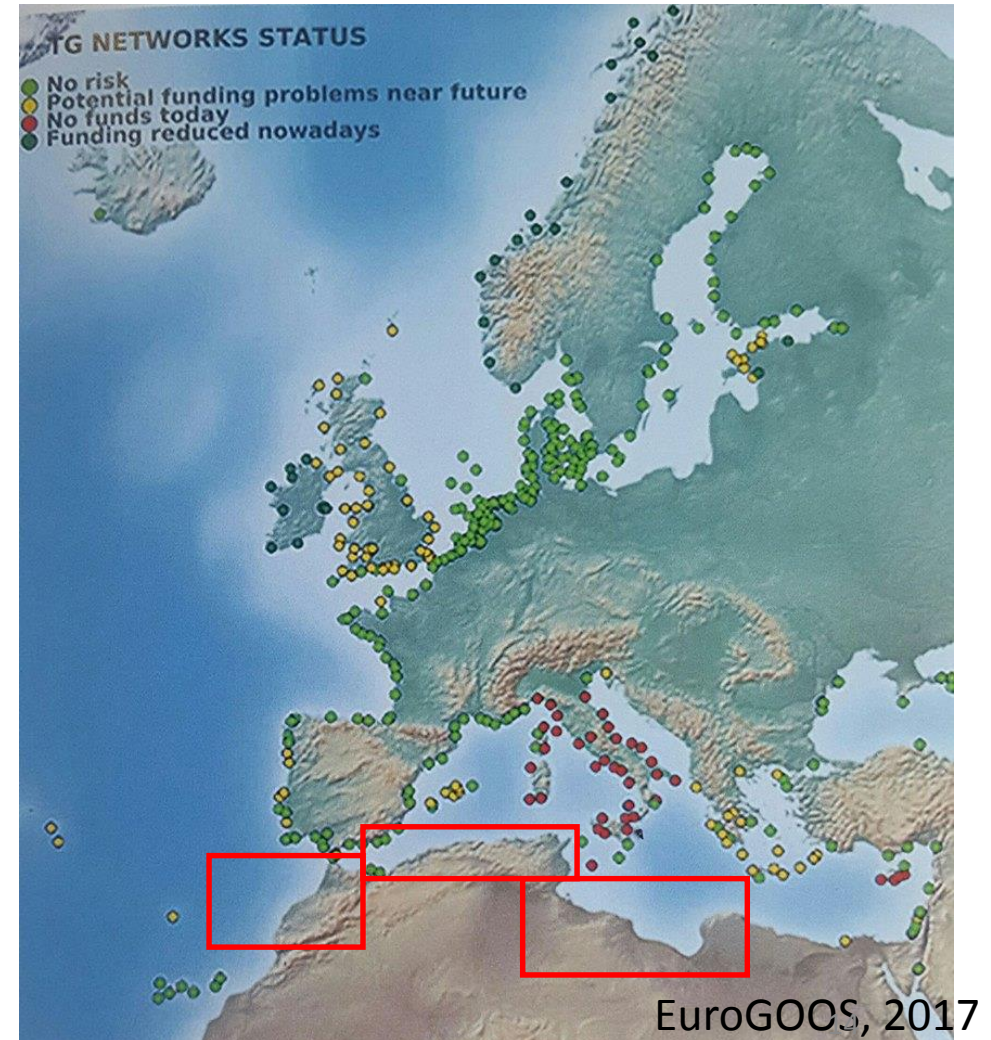
ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS WITHIN THE WATCH AREA ARE GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN BE FIVE MINUTES TO ONE HOUR. LOCATION FORECAST POINT COORDINATES ARRIVAL TIME LEVEL (ADVISORY, WATCH)

- UNITED KINGDOM - GIBRALTAR 36.13N 5.35W 0449Z 25 JAN ADVISORY
- SPAIN - CEUTA 35.89N 5.32W 0451Z 25 JAN ADVISORY
- SPAIN - MALAGA 36.72N 4.42W 0453Z 25 JAN ADVISORY
- SPAIN - ALGECIRAS 36.18N 5.40W 0453Z 25 JAN ADVISORY
- SPAIN - MELILLA 35.29N 2.94W 0455Z 25 JAN ADVISORY
- SPAIN - ALMERIA 36.84N 2.47W 0457Z 25 JAN ADVISORY
- SPAIN - CARTAGENA 37.61N 0.94W 0516Z 25 JAN ADVISORY
- SPAIN - CADIZ 36.53N 6.29W 0552Z 25 JAN ADVISORY
- SPAIN - HUELVA 37.26N 6.95W 0620Z 25 JAN ADVISORY
- MOROCCO - TANGER 35.79N 5.80W 0503Z 25 JAN ADVISORY

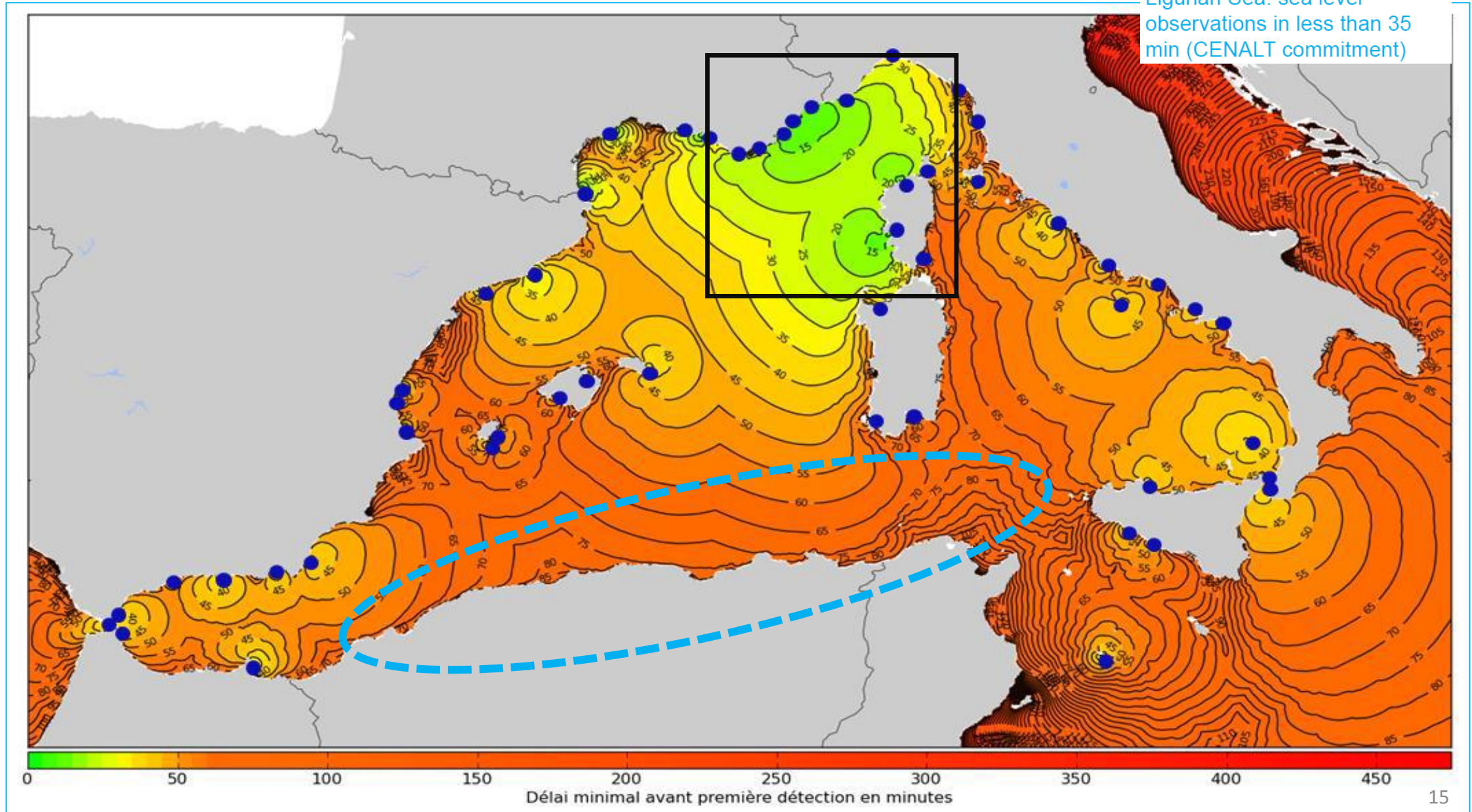


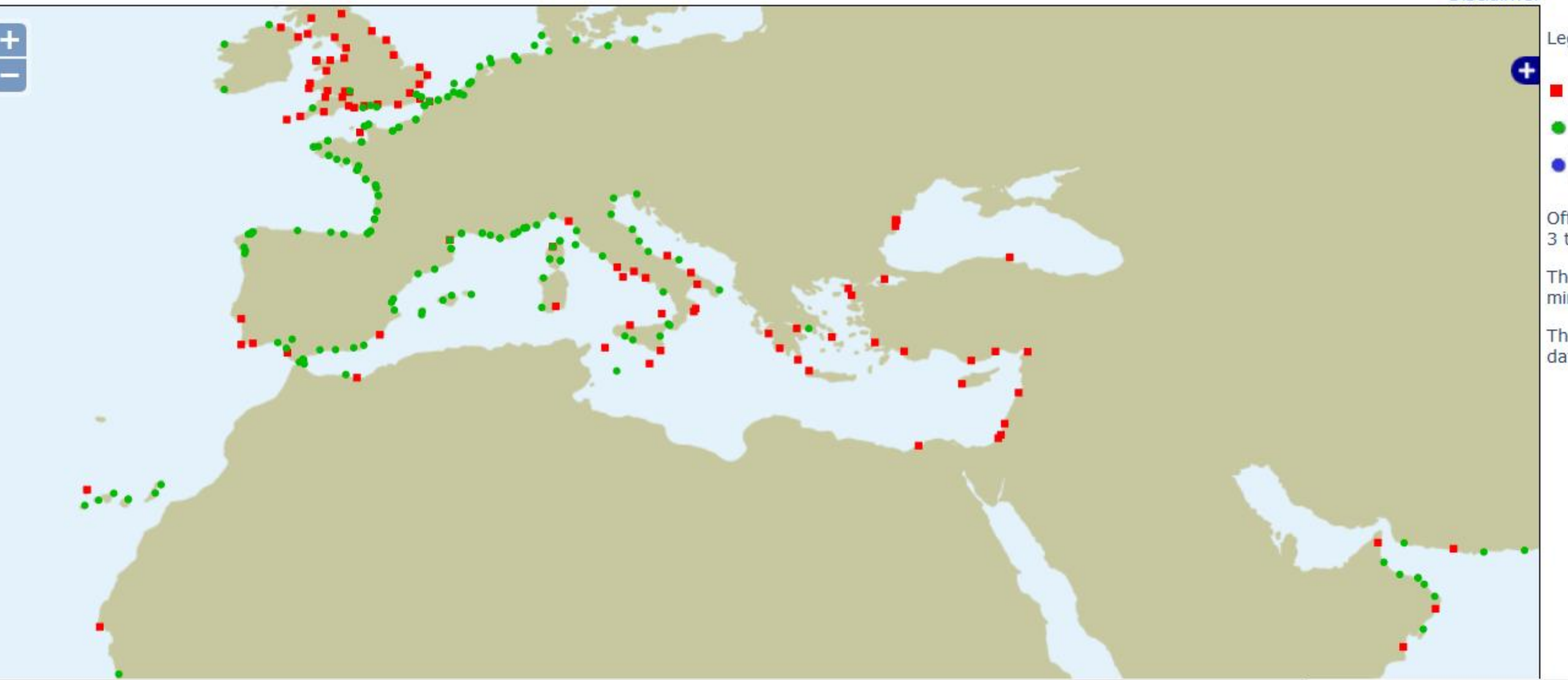
# Sea Level Network

- Many Member States have invested in the upgrade of their sea-level network and its enhancement with the implementation of new sea level stations to get faster and better tsunami detection network.
- Sea Level stations have increased from 15 in 2007 to 185 in 2015
- Gaps exist particularly North of Africa



Ligurian Sea: sea level observations in less than 35 min (CENALT commitment)





# Upcoming Tsunami Exercise

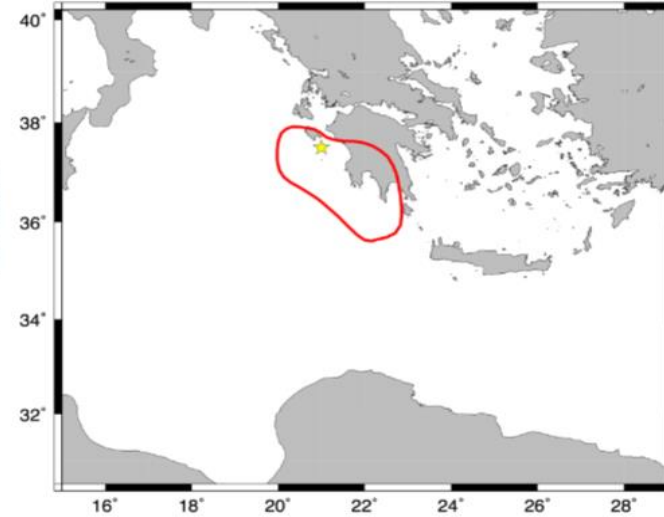
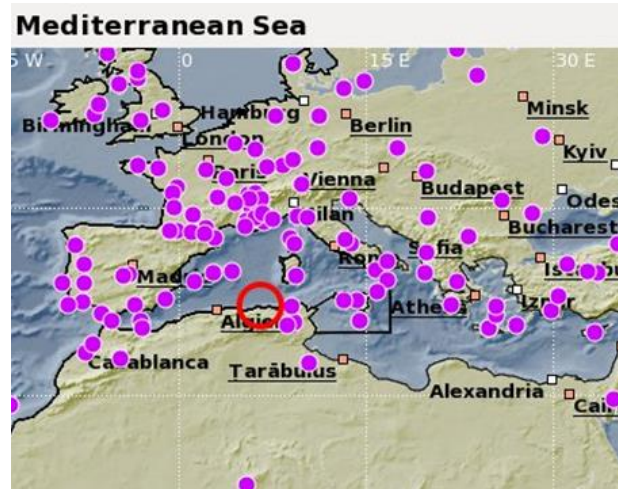
- NEAMWave17 will be held between 31<sup>st</sup> October to 3 November 2017, (prior to the WTAD on the 5<sup>th</sup> Nov 2017) with the participation of five Tsunami message providers
  - I. CENALT – Centre national d'alerte aux tsunamis (**France**) (TSP)
  - II. INGV-Centro Nazionale Terremoti, Istituto Nazionale di Geofisica e Vulcanologia (**Italy**) (TSP)
  - III. IMPA- Instituto Português do Mar e da Atmosfera (**Portugal**)
  - IV. KOERI-Kandilli Observatory and Earthquake Research Institute (**Turkey**) (TSP)
  - V. NOA-Institute of Geodynamics, National Observatory of Athens (**Greece**) (TSP)



# NEAMWave17 Scenarios

- Four tsunami exercise scenarios will be prepared by five message providers tentatively as:
  - I. SW San Vincent Cape scenario by IPMA
  - I. Algerian thrust scenario by CENALT ( 7.3 Mw, 37.14 N, 6.56 E, 16 km depth). Historically in 1856 an EQ 7.0 Mw occurred which generated a tsunami locally observed)
  - II. An earthquake scenario at NW of Crete by INGV and NOA (8.5 Mw, 37.5 N, 21.0 E, 12 km depth). Well known EQs of around 7.5 Mw were reported in 1953, 1867, 1767 and 1638)
  - III. Samandag scenario by KOERI (7.4 Mw, 36.375 N, 36.283 E, 10 km depth). Historically in 1822 an EQ of 7.0 Mw occurred, tsunami reported in the region)

# NEAMWave17 Scenarios



IPMA (SW San Vincent  
Cape)

CENALT (&.3 Mw,Algerian thrust)

INGV/NOA (8.5 Mw NW of Crete )

Samandag ( 7.4 Mw)

# Alert Messages to the Shipping Community

- Across four ICGs work continues with IHO/IMO/WMO Sub-Committee on the World-Wide Navigational Warning Service (WWNWS-SC) on the development of products by Tsunami Service Providers for use by the maritime communities.
- NAVAREA Coordinators will be informed of NEAMWave17 tsunami exercise



# Upcoming Meetings and Events

Back-to-back TSUMAPS-NEAM and IOC UNESCO NEAMTWS Information Meeting, Tunis, Tunisia 11-14 September 2017

- I. The TSUMAPS-NEAM Project Final Meeting, 11-12 September 2017
- II. IOC UNESCO Information Meeting on NEAMTWS: Reducing Tsunami Risk through Early Warning System, Preparedness and Awareness, 13-14 September 2017

- Reducing Tsunami Risk through Early Warning System, Preparedness and Awareness for Spain and Western Mediterranean countries, Madrid, Spain, 25-26 September 2017
- Participation in the World Tsunami Awareness Day, 5 Nov 2017
- ICG/NEAMTWS XIV, Lisbon, Portugal, 21-23 Nov 2017

# Recommendations to MBSHC and Member States

(From the 29th IOC Assembly, TOWS-WG, and ICG/NEAMTWS)

- I. Densify sea level networks particularly nearby tsunamigenic sources
- II. Share sea level data relevant to tsunami detection and alerts
- III. Invite NEAM NAVAREA coordinators to participate in NEAMWave 17 exercise (31 Oct – 3 November 2017)
- IV. Acknowledge the importance of high resolution bathymetry for Tsunami modelling and forecasting and encourage sharing of such data

