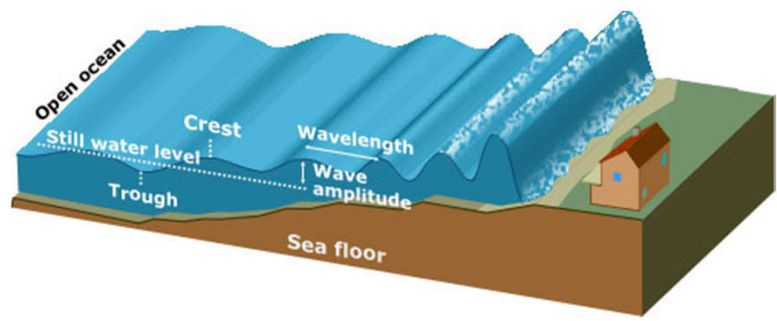
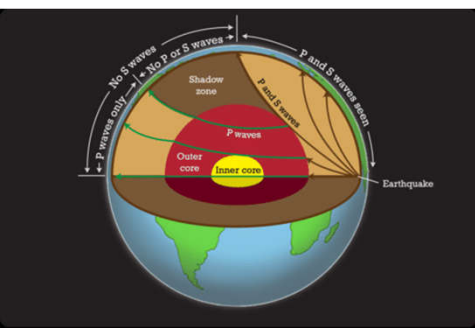


Το Σύστημα Προειδοποίησης για τσουνάμι στο ΒΑ Ατλαντικό και τη Μεσόγειο (UNESCO) - Επιστημονικές και επιχειρησιακές διαστάσεις

Δρ Γεράσιμος Α. Παπαδόπουλος

Chair, Intergovernmental Coordination Group
North East Atlantic & Mediterranean Tsunami Warning & Mitigation System

UNESCO



Early Warning Systems (EWSs)

- Πρόκειται για ενόργανα συστήματα τα οποία στη διάρκεια ενός ήδη εξελισσόμενου, δυνητικά καταστροφικού φαινομένου παρέχουν **προ-εκτίμηση για την κορύφωση αυτού**: χρόνος, τόπος, επίπεδο κινδύνου (π.χ. μετεωρολογικά φαινόμενα, σεισμός, τσουνάμι)
- Αν δεν έχει ξεκινήσει το φαινόμενο τότε αναφερόμαστε σε **πρόγνωση** (prediction, π.χ. σεισμού) ή **πρόβλεψη** (forecasting, π.χ. μετεωρολογικά φαινόμενα).
- Ένα σύστημα παρακολούθησης (monitoring) δεν είναι κατ' ανάγκην EWS.



United Nations
Educational, Scientific and
Cultural Organization



Intergovernmental
Oceanographic
Commission

Establishment

ICG/NEAMTWS was formally established during the twenty-third IOC Assembly Session

(21-30 June 2005) through Resolution IOC-XXIII-14

Operations

Gradually since summer 2012

Accreditation

Four centers: Sept. 2016

ICG/NEAMTWS

Purpose

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

Activities

Early Warning
Technical Support
Risk Assessment & Mitigation
Public Awareness
Meetings & Publications



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Member States

40 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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Governance of NEAMTWS

Officers

Chairperson

Gerassimos A. Papadopoulos

(Greece)

Vice-chairpersons

Anna Gyldenfeldt (Federal Maritime
and Hydrographic Agency,
Germany)

Stefano Lorito (Istituto Nazionale di
Geofisica e Vulcanologia, Italy)

IOC/UNESCO

Head of Tsunami Section

Thorkild Aarup

ICG/NEAMTWS Technical Secretary

Denis Chang Seng



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Technical Working Groups and Task Teams

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)

[Francesco Mele](#) (National Institute of Geophysics and Volcanology, Italy)

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

Co-Chairs: [Carlos Santos Fernandes](#) (Oceanographic Division of Instituto Hidrográfico, Portugal)

- **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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TOWS WG Task Teams

•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

Marzia Santini (Dept. of Civil Protection, Italy)

Amir Yahav (National Emergency Management Authority, Israel)



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Accreditation of NEAMTWS Tsunami Service Providers (TSPs)

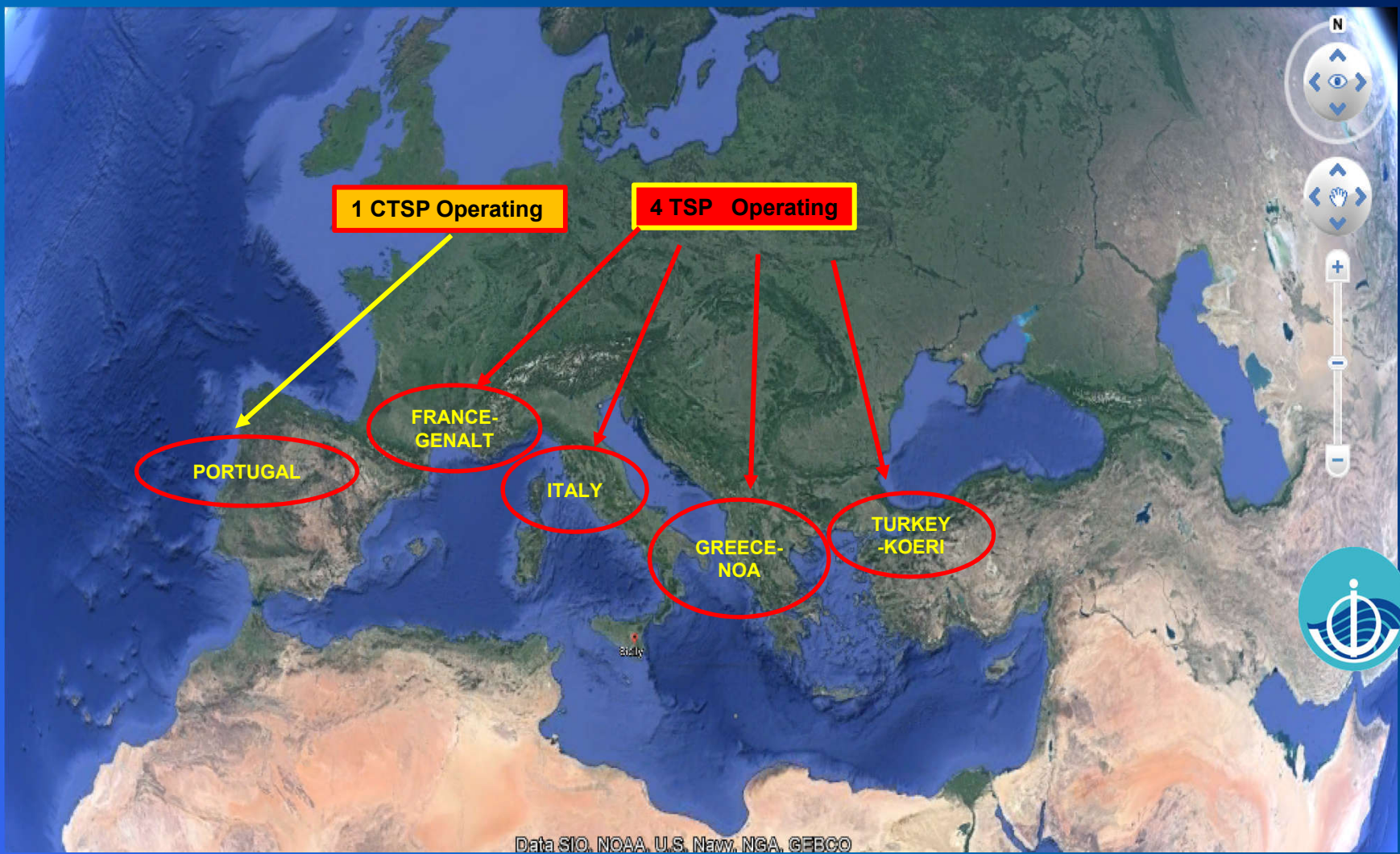
Following an Accreditation process established by the ICGNEAMTWS, the ICG/NEAMTWS- XIII session in Bucharest, Romania, 26-28 September 2016 granted the status of NEAMTWS Tsunami Service Providers (TSP) to the following institutions:

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 to start their National Tsunami Warning Centers during 2017. IPMA Portugal is CTSP



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



Εθνικό Κέντρο Προειδοποίησης για Τσουνάμι

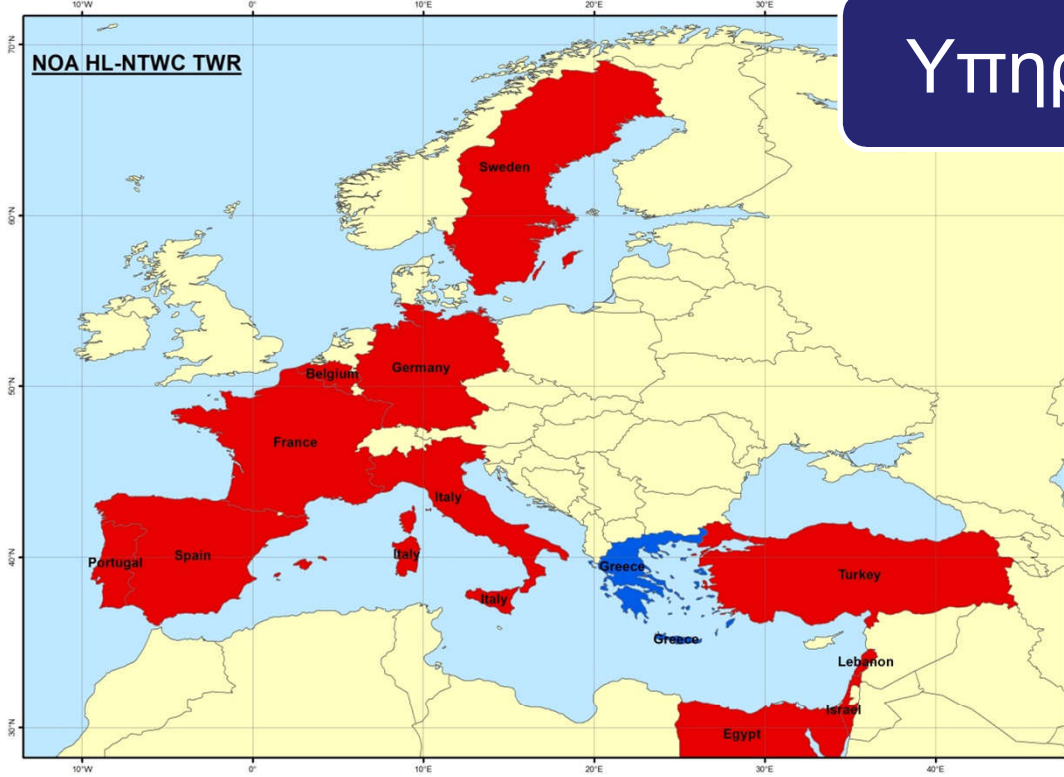
Ίδρυση Σεπτ. 2010 – Επιχειρησιακό από Αυγ. 2012
(24/7/365)

1 από τα 4 Κέντρα στον
Ευρω-Μεσογειακό χώρο,
ΙΟС/UNESCO



- Έρευνα & Ανάπτυξη Υποδομών
- Υπηρεσίες Προειδοποίησης
(εθνικό & διεθνές επίπεδο)
- Εκπαίδευση & Ασκήσεις

Υπηρεσίες Προειδοποίησης



Παράληπτες Μηνυμάτων

Γεν. Γραμματεία Πολιτικής Προστασίας



Οργανισμός Αντισεισμικού Σχεδιασμού & Προστασίας

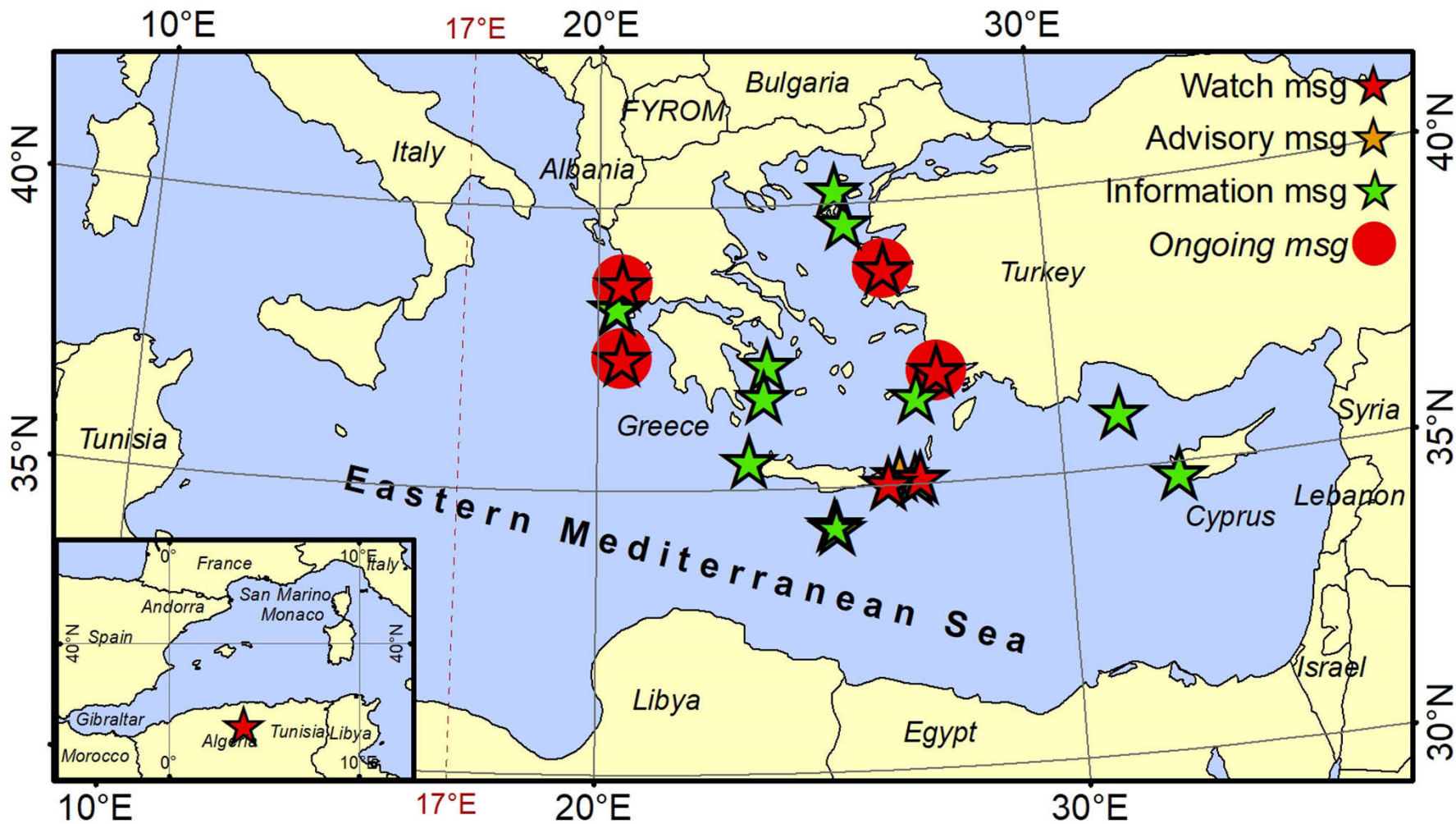


17 υπηρεσίες σε 12 Κράτη-Μέλη
3 Διεθνή Κέντρα
(IOC/UNESCO, ERCC-EU, JRC)
3 Διεθνή Συστήματα Προειδοποίησης

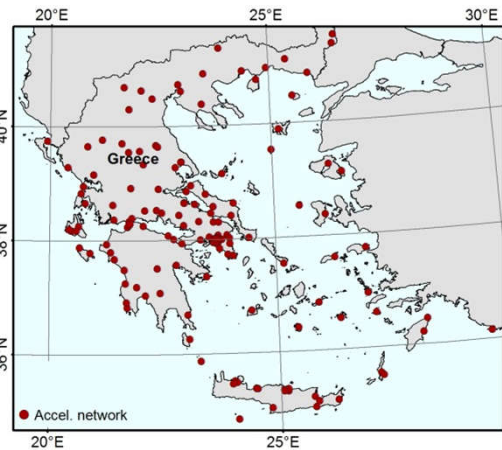


Εθνικό Κέντρο Προειδοποίησης για Τσουνάμι

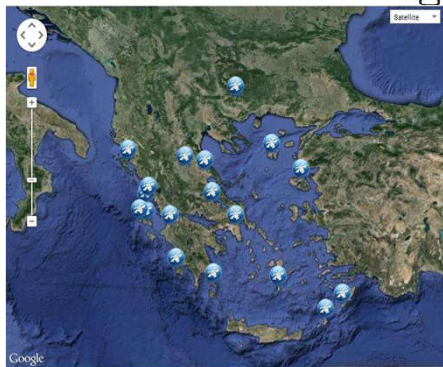
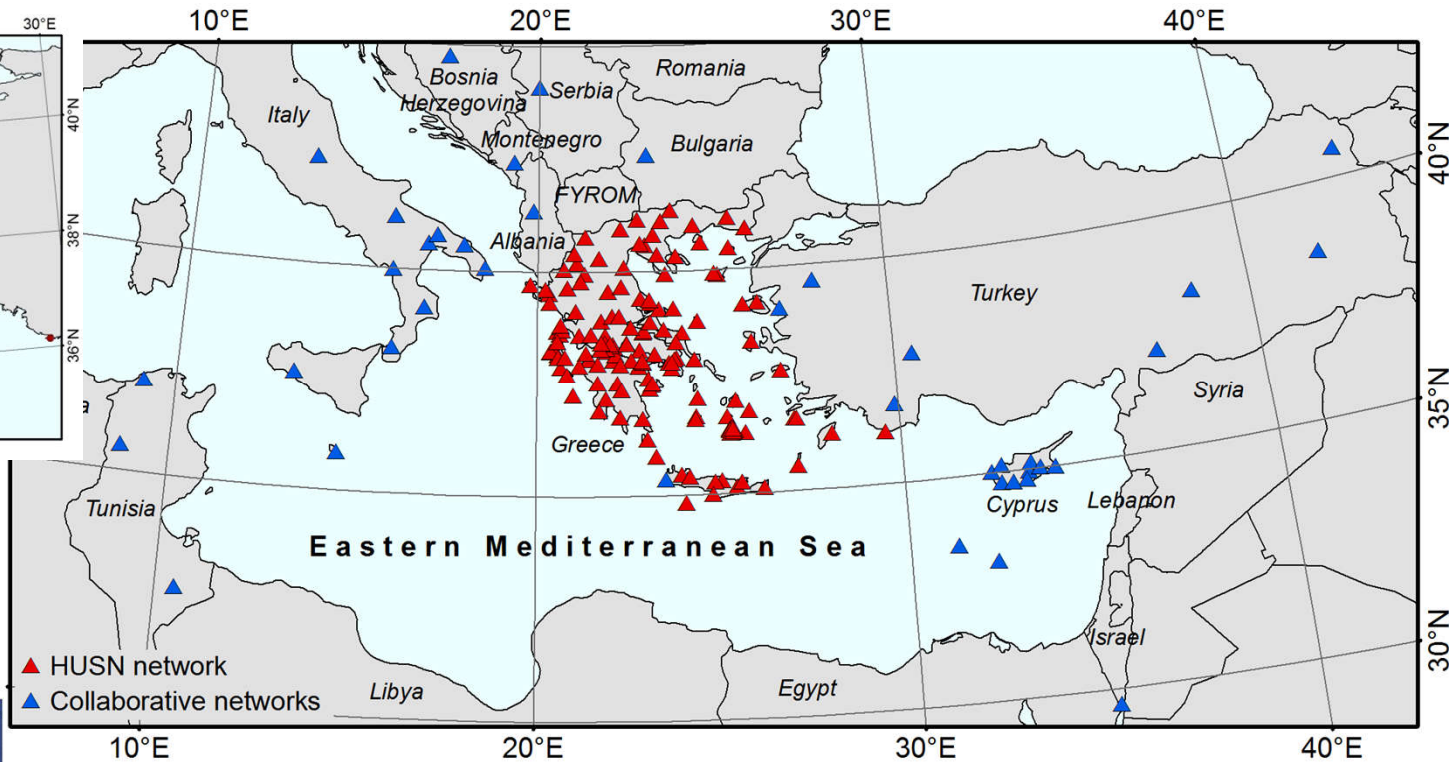
Ίδρυση Σεπτ. 2010 – Επιχειρησιακό 24/7/365 από Αυγ. 2012



Δίκτυα σειсмоγράφων και GPS



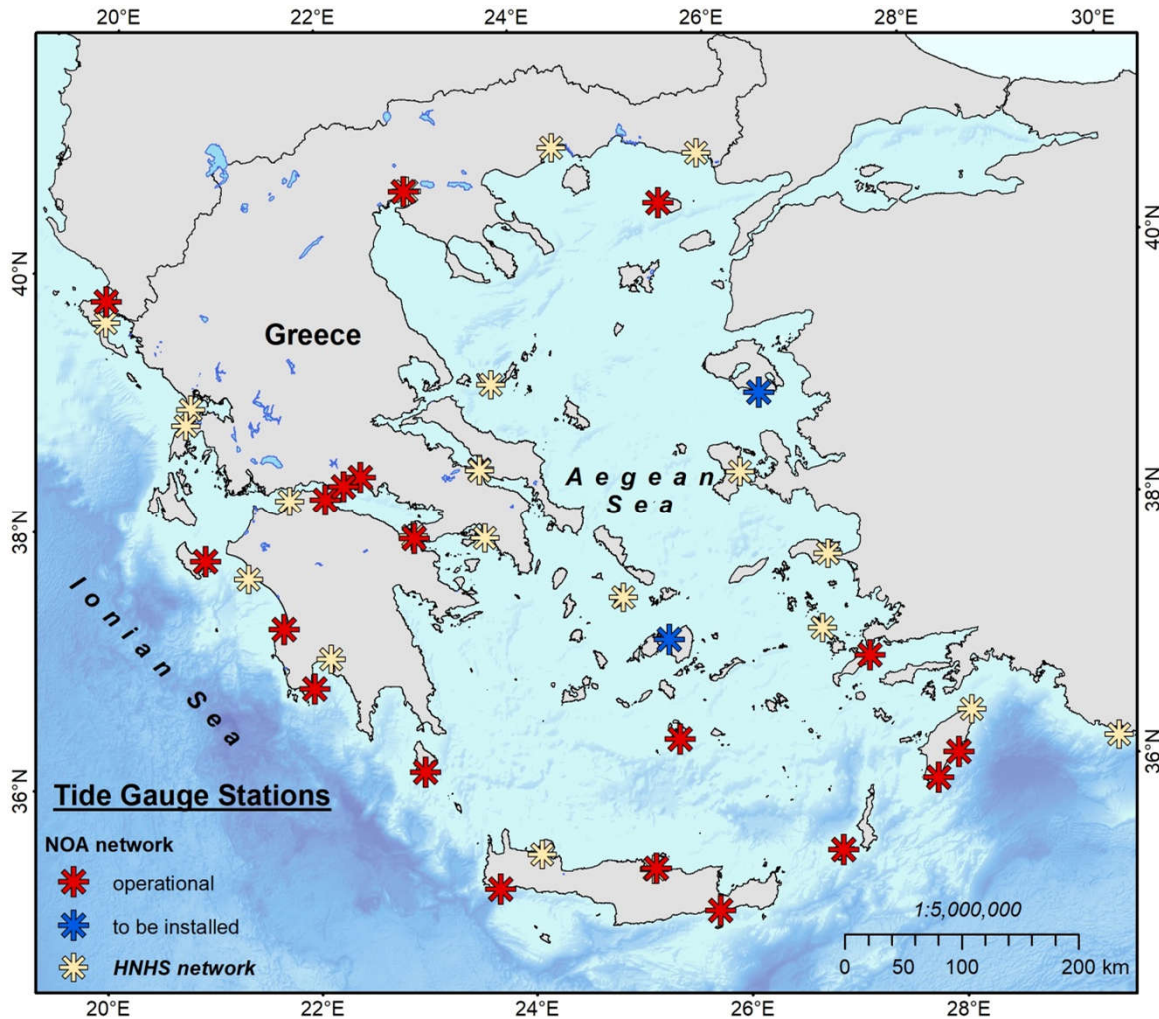
Accelerometric network comprising of over **140** stations.



GPS network of **20** continuous stations

The core network that supports the HL-NTWC is the Hellenic Unified **Seismic Network** (HUSN), which incorporates more than **155** seismic stations. In addition, seismic stations located in Greece and in neighboring countries, that belong to affiliated collaborative partner networks, such as GEOFON (GE), MEDNET (MN), INGV (IV), KOERI (KO) and Cyprus (CQ), are also available online

Δίκτυο Παλιρροιογράφων

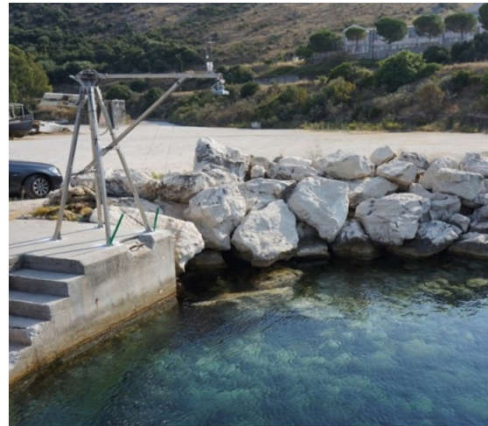


Δίκτυο Παλιρροιογράφων

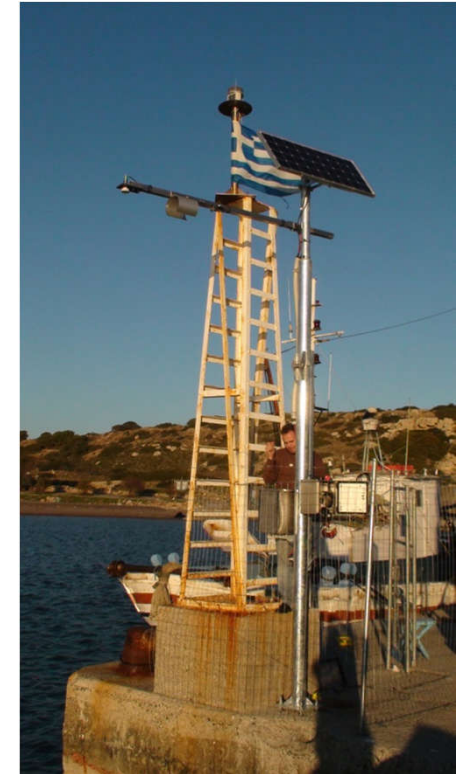
SANTORINI – tide gauge station



CORFU – tide gauge station



KALATHOS – tide gauge station

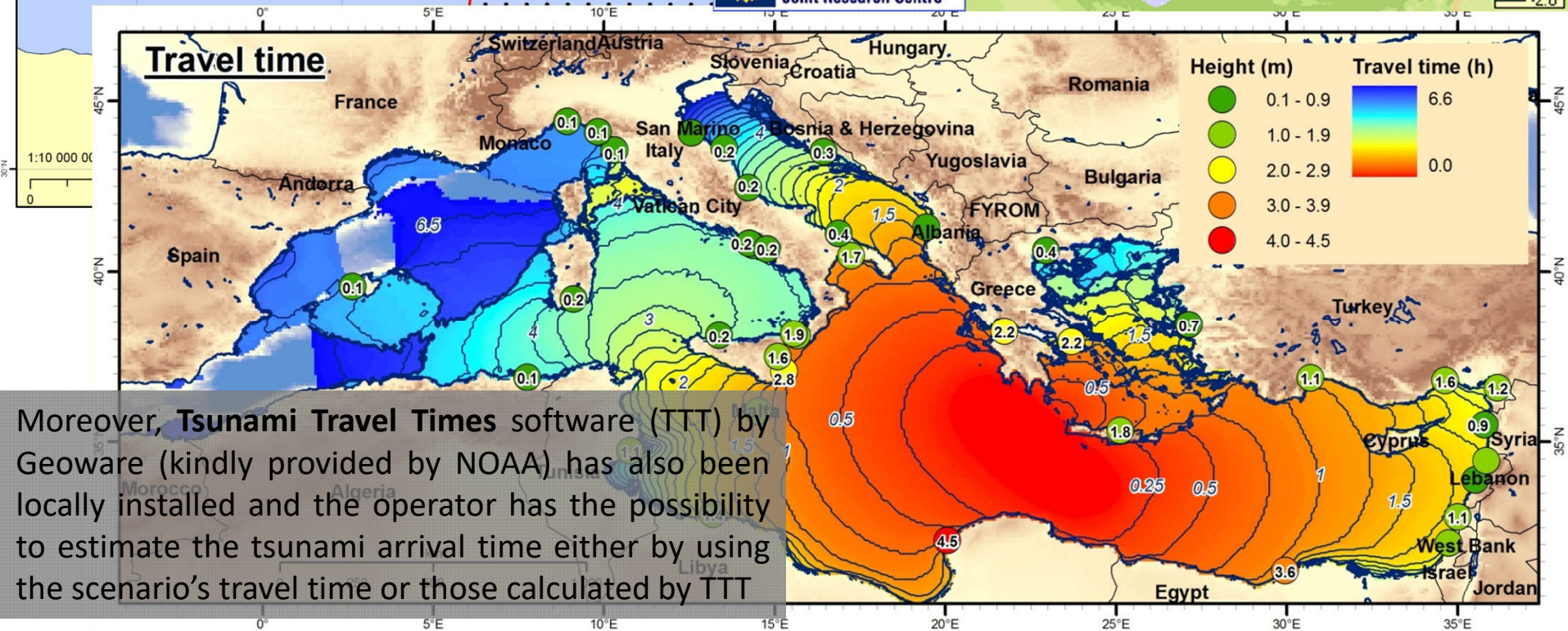
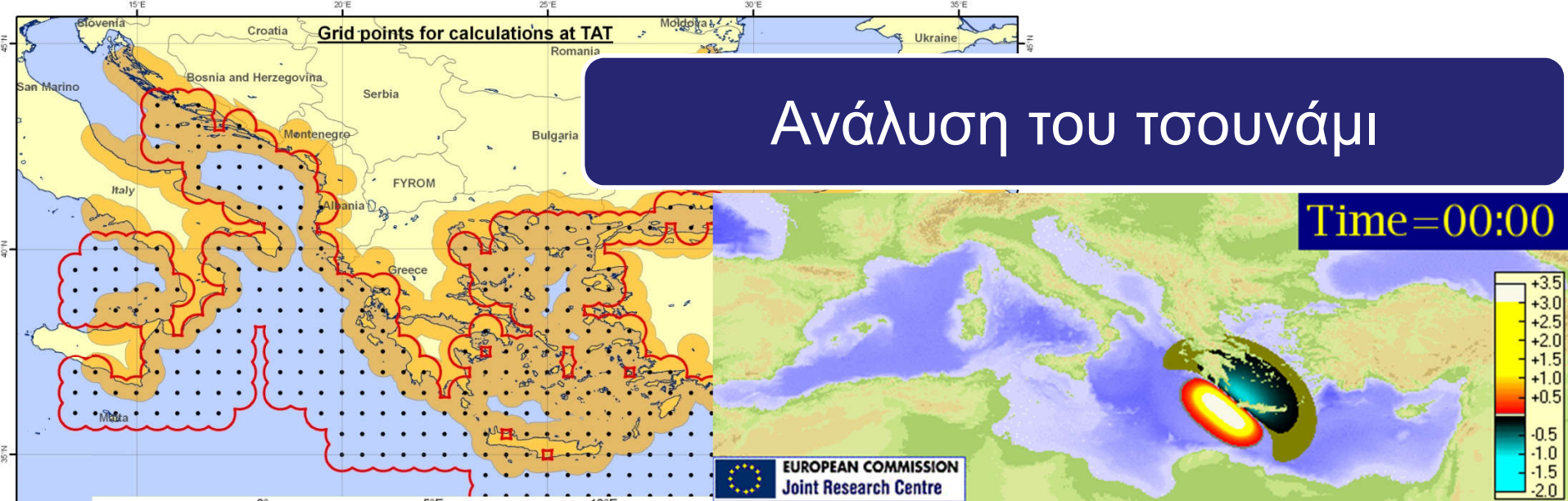


THESSALONIKI – tide gauge station

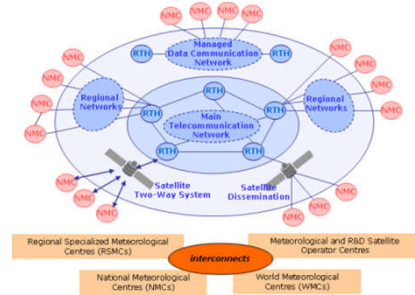


PLIMIRI – tide gauge station

Ανάλυση του τσουνάμι

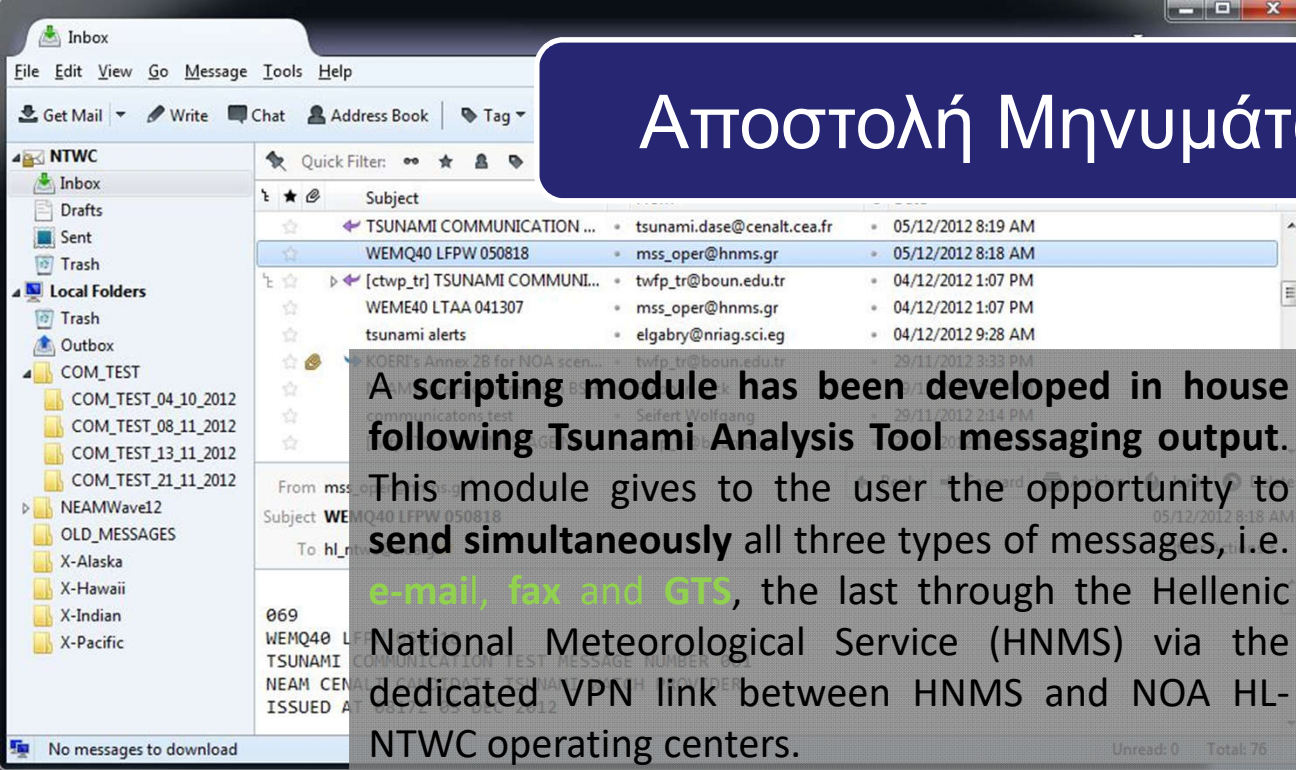


Αποστολή Μηνυμάτων



A scripting module has been developed in house following Tsunami Analysis Tool messaging output. This module gives to the user the opportunity to send simultaneously all three types of messages, i.e. e-mail, fax and GTS, the last through the Hellenic National Meteorological Service (HNMS) via the dedicated VPN link between HNMS and NOA HL-NTWC operating centers.

The SMS technology has also been used during the last exercise (NEAMWAVE14) and the extended Communication Tests.



Time/Date	Sender	Message
2012-12-09 08:15:38 AM	0225548020	1 fax000000594.tif
2012-12-06 01:04:10 PM	2103359981	1 fax000000590.tif
2012-12-06 12:59:39 PM	2103359981	1 fax000000589.tif
2012-12-05 08:21:44 AM	351 218402370	1 fax000000587.tif
2012-12-05 08:21:35 AM	351 218402370	1 fax000000586.tif
2012-12-05 08:19:52 AM	+33 169271874	1 fax000000585.tif
2012-11-28 03:01:20 PM	BOUN KOERI	1 fax000000577.tif
2012-11-28 01:03:18 PM	BOUN KOERI	1 fax000000576.tif
2012-11-28 12:26:29 PM	BOUN KOERI	1 fax000000575.tif
2012-11-28 12:11:59 PM	BOUN KOERI	2 fax000000574.tif
2012-11-28 10:43:43 AM	+33 169271874	1 fax000000573.tif
2012-11-28 09:57:00 AM	+33 169271874	2 fax000000572.tif
2012-11-28 09:18:59 AM	+33 169271874	2 fax000000571.tif

```

HylaFAX scheduler on noa-fax: Running
Modem ttyr01 (0030.210.3490198): Running and idle
Modem ttyr00 (0030.210.3490050): Running and idle
Modem ttyr02 (0030.210.3490155): Running and idle
Modem ttyr03 (0030.210.3490194): Running and idle
    
```

Mass sms details

Group name: NEAMWAVE14 (32)

Originator: NOAHLNTWC

Date: 2014-10-29 16:08:28

INAMI EXERCISE MSG:NEAMTWS-NOA...
Y:GZ SY:1408Z 29OCT2014EQ Mw6.0
23.20E22.5KM*TEST*

Originator	Message	Status
NOAHLNTWC	SP4659	Delivered 1 sms
NOAHLNTWC	IT4382	Delivered 1 sms
NOAHLNTWC	CY4790	Delivered 2 sms
NOAHLNTWC	IR4413	Delivered 2 sms
NOAHLNTWC	IR4413	Delivered 1 sms
NOAHLNTWC	EG4PT2	Sent 1 sms
NOAHLNTWC	SP4658	Delivered 2 sms
NOAHLNTWC	IR4414	Delivered 1 sms
NOAHLNTWC	IR4413	Delivered 1 sms
NOAHLNTWC	IR4413	Delivered 1 sms
NOAHLNTWC	GR4EC2	Delivered 1 sms

EWSs: Βασικές Αρχές

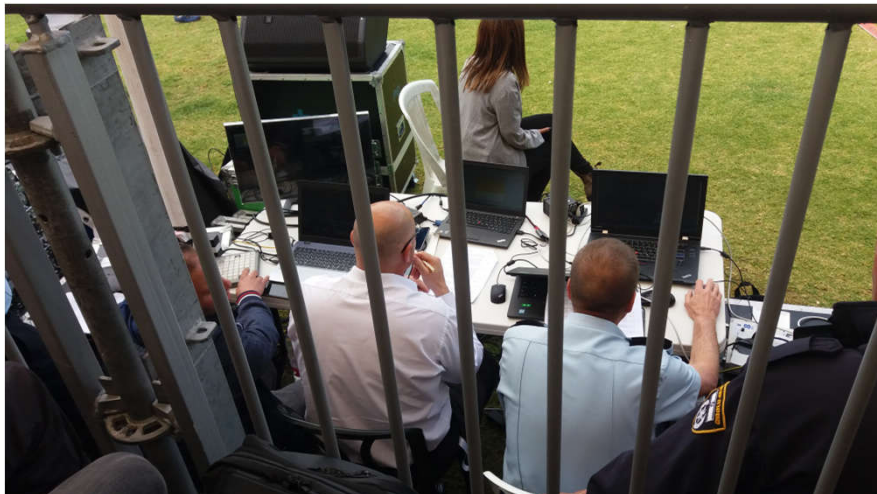
- **Αρχές λειτουργίας**
 - 24/7 για αποστολή μηνυμάτων (*up-stream component*)
 - 24/7 για λήψη μηνυμάτων
 - 24/7 για προώθηση μηνυμάτων (*down-stream component*)
 - Πρωτόκολλα ενεργειών (*Standard Operational Procedures*)
 - Διαδικασίες ασφαλείας (*back-up*)
 - προσωπικό
 - Η/Υ και λογισμικά
 - ενεργειακά συστήματα
 - επικοινωνίες
- **Υποστηρικτικές Λειτουργίες**
 - Έλεγχοι επικοινωνιών (communication tests) εσωτερικά/εξωτερικά
 - Ασκήσεις (εσωτερικά/εξωτερικά) (NEAMWAVE 2012, 2014, 2017)
 - Εκπαίδευση (εσωτερικά/εξωτερικά)

Τελ-Αβίβ: μεγάλη end-to-end άσκηση (12.3.2019)

- **Σενάριο**
- Κύπρος M7,3
- Έγκαιρη προειδοποίηση για τσουνάμι (7-8 min)
- Κινητοποίηση δυνάμεων επίγειων και εναέριων
- Εκκένωση σχολείων
- Συγκέντρωση εκατοντάδων μαθητών σε ασφαλή χώρο
- Κύμα ύψους > 5 m



Τελ-Αβίβ: μεγάλη end-to-end άσκηση (12.3.2019)



Τελ-Αβίβ: μεγάλη end-to-end άσκηση (12.3.2019)

