

## **Tsunami Exercise NEAMWave17**

**A Tsunami Warning and Communication Exercise for the  
North-eastern Atlantic, the Mediterranean, and Connected  
Seas Region**

**31 October – 3 November 2017**

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# What is NEAMWave?



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TSUNAMI EXERCISE



## NEAMWave17

Regular tsunami exercise in **NEAM** (North-eastern Atlantic, the Mediterranean and Connected Seas) **region** between:

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**Message Providers** (Candidate/Tsunami Service Providers) and

**Message Receivers** (Tsunami Warning Focal Points (TWFPs), Tsunami National Contacts (TNC), Civil Protection Agencies (CPAs) and Emergency Response Coordination Center (ERCC)

.....within the coordination of UNESCO/IOC Intergovernmental Coordination Group (ICG) in three phases as: **Phase A**, **Phase B** and **Phase C**.



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# Scope of NEAMWave17



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## NEAMWave17

### PHASE A

**C/TSPs** ..... To maintain a high state of operational readiness, to test their communicational channels among message recipients in NEAM region

### PHASE B

**National Tsunami Warning Centres (NTWCs) and Civil Protection Agencies (CPAs)** .....to practice their emergency response procedures in order to ensure that (i) vital communication links work seamlessly, and that (ii) agencies and response personnel know the roles that they will need to play during a real event.

### PHASE C

**Emergency Response Coordination Center (ERCC)** ..... to practice their emergency response procedures in order to provide international assistance upon request.



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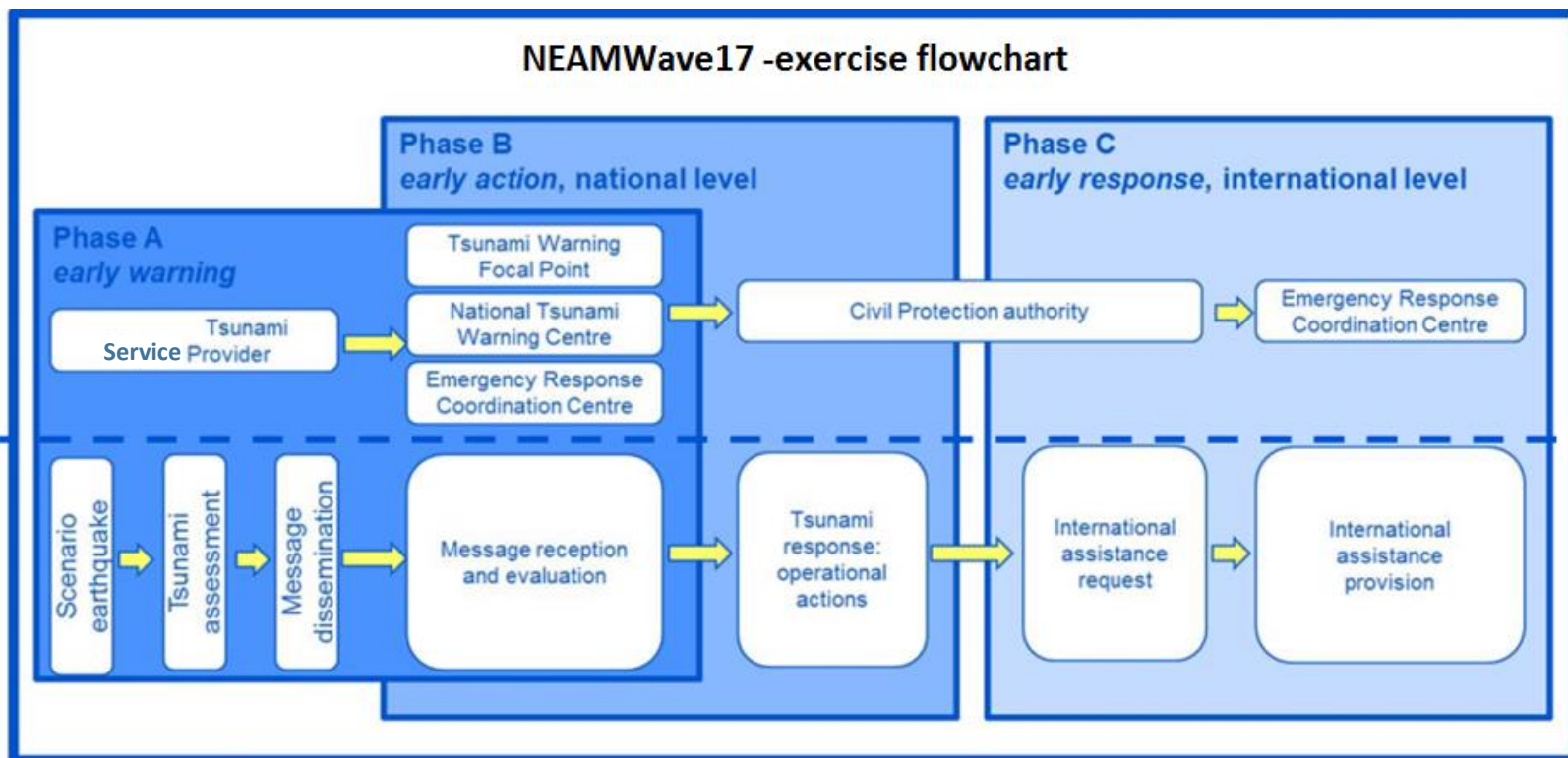
# NEAMWave17 Flowchart



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## NEAMWave17





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# NEAMWave17 Phases



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## NEAMWave17

### Phase A

#### C/TSPs

Event  
detection;  
issuing and  
dissemination  
of the alert  
messages

### Phase B

#### TWFP/NTWC

Confirmation of  
the Tsunami  
Messages'  
receipt and  
forwarding to  
national CPA,

#### CPA

National  
decision making  
process about  
response  
actions and  
public warnings  
and  
evacuations

### Phase C

#### CPA

Request of  
international  
assistance

#### ERCC



Provision of  
international  
assistance upon  
request of the  
affected  
Countries

**CENALT (France), NOA (Greece), IPMA (Portugal) and KOERI (Turkey)**

**had disseminated exercise alert messages as Message Providers in NEAMWave12 and NEAMWave14.**

**4 different earthquake and tsunami scenarios**



CTWP	Exercise subscribers
	
<b>NEAMWave14</b>	<b>NEAMWave14</b>
KOERI	9
NOA	6

**Table 1.** Exercise subscribers to Phase A from the IOC Table (excluding the CTWP responsible for the scenario)

COUNTRY PARTICIPATION IN NEAMWAVE 14												
INSTITUTION		SCENARIO										
		BLACK SEA		NORTH EAST ATLANTIC		WESTERN MEDITERRANEAN		EASTERN MEDITERRANEAN				
		Phase A	Phase B	Phase A	Phase B	Phase A	Phase B	Phase A	Phase B	Country requires international assistance	Country offering international assistance	No participation
CROATIA	NPRD	NO	NO	NO	NO	NO	NO	YES	NO			X
CYPRUS	CD	NO	NO	NO	NO	NO	NO	YES	YES	X		
EGYPT	NIOF	NO	NO	NO	NO	NO	NO	YES	YES			
FINLAND	MET	YES	NO	YES	NO	YES	NO	YES	NO			X
FRANCE	COGIC	NO	NO	NO	NO	YES	YES	NO	NO			X
GERMANY	BSH	YES	NO	YES	NO	YES	NO	YES	YES			X
	MET	YES	NO	YES	NO	YES	NO	YES	NO			X
GREECE	NOA	YES	NO	YES	NO	YES	NO	YES	YES			X
IRELAND	GS	NO	NO	YES	YES	NO	NO	NO	NO			X
ISRAEL	GI	NO	NO	NO	NO	NO	NO	YES	YES	X		X
ITALY	DPC	NO	NO	NO	NO	NO	NO	YES	YES	X		
LEBANON	CNRS	NO	NO	NO	NO	YES	NO	YES	YES			X
MALTA	CP	NO	NO	NO	NO	YES	NO	YES	YES	X		
MONACO	SA/POM	NO	NO	NO	NO	YES	YES	NO	NO			X
PORTUGAL	ANPC	NO	NO	YES	YES	NO	NO	NO	NO			X
	IPMA	YES	NO	X	X	YES	NO	YES	NO			X
ROMANIA	NIEP	YES	YES	NO	NO	NO	NO	NO	NO			X
RUSSIA	RPA	YES	NO	NO	NO	NO	NO	NO	NO			X
SPAIN	DGPCE	YES	NO	YES	YES	YES	YES	YES	NO		X	
SWEDEN		YES	NO	YES	NO	YES	NO	YES	NO			X
TURKEY	KOERI	YES	NO	YES	NO	YES	NO	YES	NO			X
	AFAD	NO	YES	NO	NO	NO	NO	YES	NO			X
UK	CC	NO	NO	YES	YES	NO	NO	NO	NO			X

**Table III-1.** Country participation in Exercise NEAMWave 14



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# NEAMWave17 Scenarios



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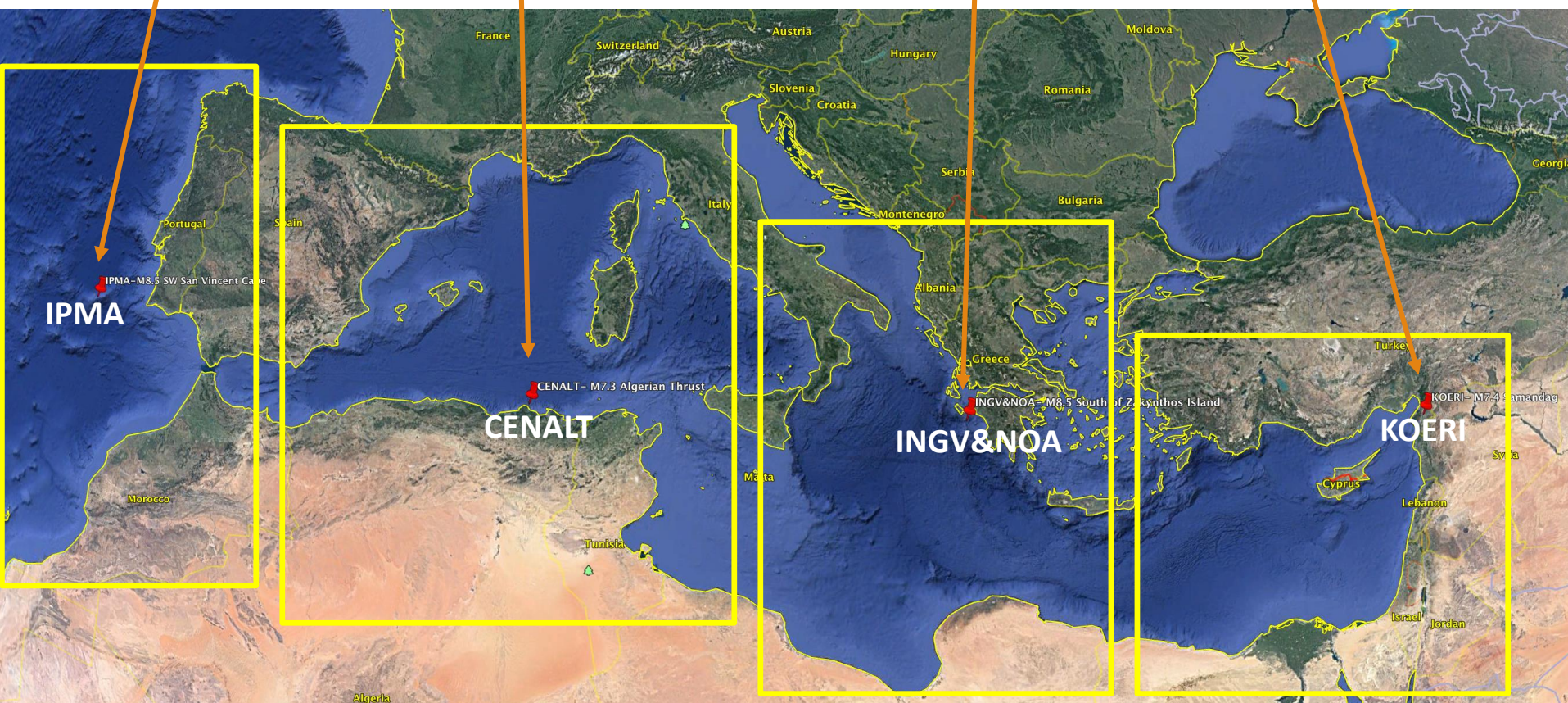
## NEAMWave17

NE Atlantic

Western Mediterranean

Central Mediterranean

Eastern Mediterranean



4 Earthquake Scenarios ----- 5 Message Providers



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# IPMA SCENARIO



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NEAMWave17

## North-eastern Atlantic Scenario



### SW of San Vincent Cape



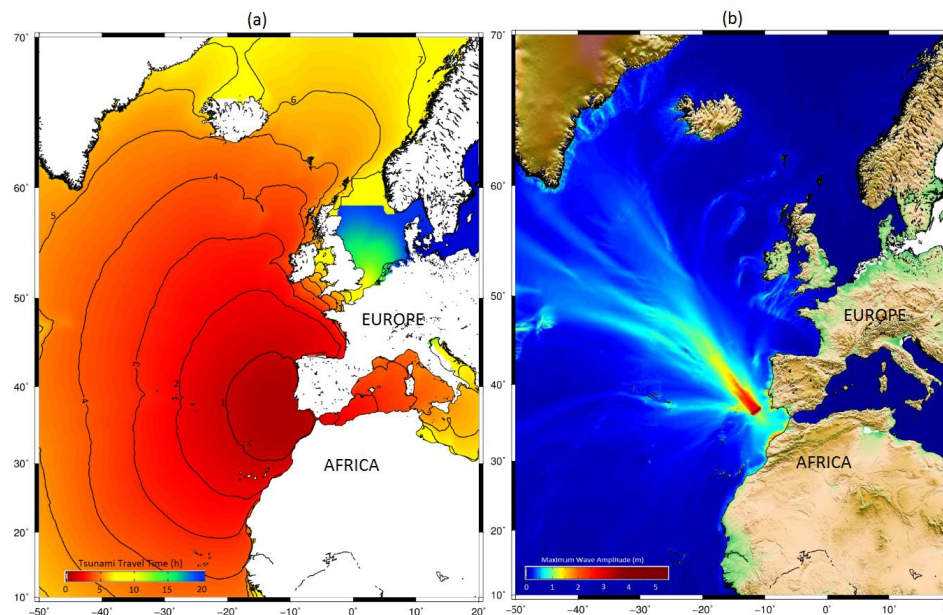
Origin Time of the  
exercise

09:00:00 UTC,  
3-November-2017

#### Earthquake Scenario parameters

Location (Epicenter)	Lat 36.66°N, Lon 11.33°W
Magnitude	8.5 Mw
Depth (Hypocenter)	27 km

9 messages from T0 to T0+7hours





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# CENALT SCENARIO



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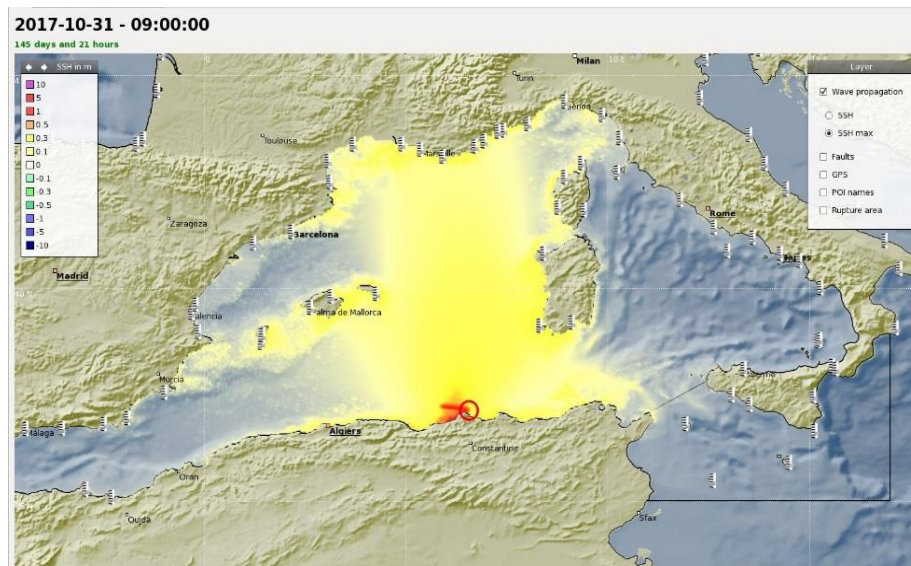
## NEAMWave17

### Western Mediterranean Scenario



### Algerian Thrust

ORIGIN TIME - 0900Z 31 OCT 2017  
COORDINATES - 37.14 NORTH 6.56 EAST  
DEPTH - 15 KM  
LOCATION - WESTERN  
MEDITERRANEAN SEA  
MAGNITUDE - 7.3





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# INGV & NOA SCENARIO



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## NEAMWave17

**A joint scenario for the first time!!**

## Central Mediterranean Scenario



INGV  
terremoti  
vulcani  
ambiente

ISTITUTO NAZIONALE  
DI GEOFISICA E VULCANOLOGIA

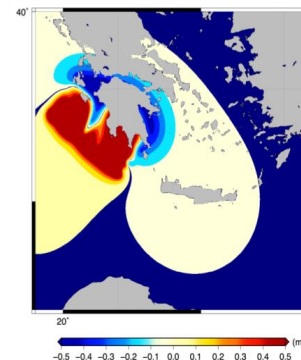
## South of Zakynthos Island



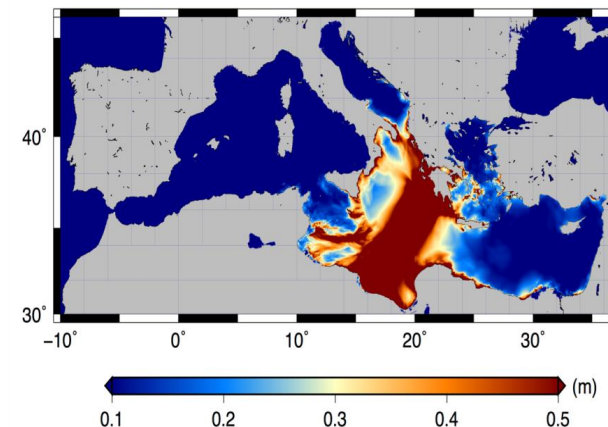
### Earthquake parameters

Mw	8.5
Longitude	21.0 °E
Latitude	37.5 °N
Depth (km)	12.0
Rupture Area (km <sup>2</sup> )	~40000
Slip (m)	6.5 (uniform)
Rigidity (GPa)	~26
Rake	90°

a)



b)



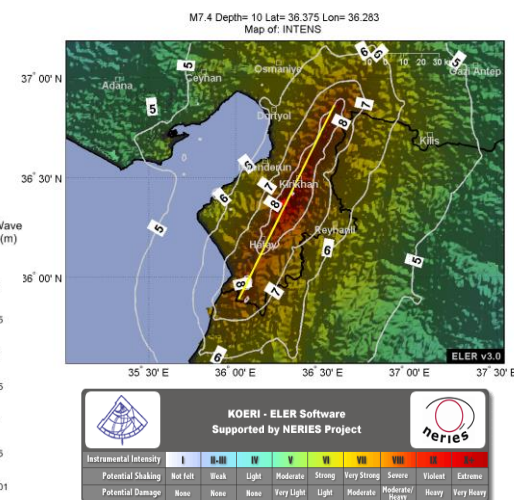
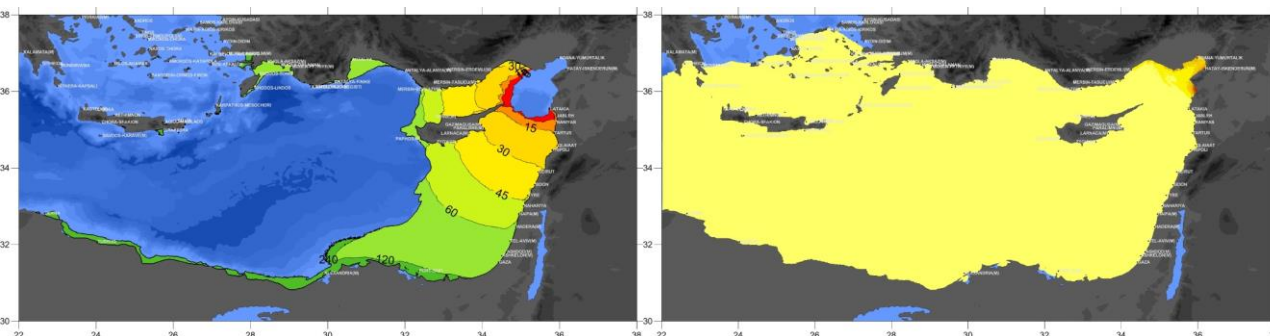
**PHASE C scenario!**

## Eastern Mediterranean Scenario

### Samandag



Mw	Lat	Lon	Depth	Fault Length	Fault Width	Average Slip	Strike	Dip	Rake
7.4	36.375° N	36.283° E	10 km	77 km	20 km	3.2 m	30°	80°	320°





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# Timetable of the exercise



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	<b>31/10/2017</b> <b>9:00 – 10:20UTC</b>	<b>01/11/2017</b> <b>9:00 – 12:00UTC</b>	<b>02/11/2017</b> <b>9:00 – 12:30UTC</b>	<b>03/11/2017</b> <b>9:00 – 16:00UTC</b>
<b>Western Mediterranean scenario (CENALT)</b>	Phase A, B and C			
<b>Eastern Mediterranean scenario (KOERI)</b>		Phase A and B		
<b>Central Mediterranean scenario (INGV-NOA)</b>			Phase A and B	
<b>North East Atlantic scenario (IPMA)</b>				Phase A and B

**Phase C will be  
implemented afternoon!**



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# Phase A: Tsunami Alert Message Dissemination



TSUNAMI MESSAGE NUMBER 001  
NEAM CENALT TSUNAMI SERVICE PROVIDER  
ISSUED AT 0912Z 31 OCT 2017

... TSUNAMI WATCH ...  
THIS ALERT APPLIES TO ALGERIA ... FRANCE ... ITALY ... MONACO ...  
MOROCCO ... SPAIN ... TUNISIA ... UNITED KINGDOM

... TSUNAMI INFORMATION ...  
THIS ALERT APPLIES TO ALBANIA ... BELGIUM ... BULGARIA ... CAPE VERDE  
... CROATIA ... CYPRUS ... DENMARK ... EGYPT ... ESTONIA ... FINLAND  
... GEORGIA ... GERMANY ... GREECE ... ICELAND ... IRELAND ... ISRAEL  
... LEBANON ... LIBYA ... MALTA ... MAURITANIA ... NETHERLANDS ...  
NORWAY ... POLAND ... PORTUGAL ... ROMANIA ... RUSSIAN FEDERATION ...  
SLOVENIA ... SWEDEN ... SYRIA ... TURKEY ... UKRAINE

THIS MESSAGE IS ISSUED AS ADVICE TO GOVERNMENT AGENCIES. ONLY NATIONAL  
AND LOCAL GOVERNMENT AGENCIES HAVE THE AUTHORITY TO MAKE DECISIONS  
REGARDING THE OFFICIAL STATE OF ALERT IN THEIR AREA AND ANY ACTIONS  
TO BE TAKEN IN RESPONSE.

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS  
ORIGIN TIME - 0900Z 31 OCT 2017  
COORDINATES - 37.14 NORTH 6.56 EAST  
DEPTH - 15 KM  
LOCATION - WESTERN MEDITERRANEAN SEA  
MAGNITUDE - 7.3

EVALUATION OF TSUNAMI WATCH  
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 GREATER THAN 0.5M  
AND/OR CAUSE A TSUNAMI RUN-UP GREATER 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 CAN CAUSE DAMAGE OR  
MAJOR EFFECT IN THE MEDITERRANEAN AREA. INFORMATION ONLY.

ESTIMATED INITIAL WAVE HEIGHTS ARE 0.5M TO 1M. THE INITIAL WAVE  
THE WATCH AREA AFTER THE INITIAL WAVE IS A SERIES OF  
WAVES  
AND THE TIME BETWEEN WAVES IS FIVE MINUTES TO ONE HOUR.

LOCATION FORECAST POINT COORDINATES ARRIVAL TIME LEVEL (ADVISORY,  
WATCH)

ALGERIA - JIJEL 36.82N 5.79E 0916Z 31 OCT WATCH  
ALGERIA - ALGER 36.77N 3.08E 0939Z 31 OCT WATCH  
TUNISIA - TABARKA 36.96N 8.75E 0939Z 31 OCT WATCH  
TUNISIA - TUNIS 36.81N 10.31E 1103Z 31 OCT WATCH  
SPAIN - MAHON 39.89N 4.26E 0948Z 31 OCT WATCH  
SPAIN - IBIZA 38.91N 1.43E 1014Z 31 OCT WATCH  
SPAIN - PALMADEMALLORCA 39.57N 2.65E 1014Z 31 OCT WATCH  
SPAIN - BARCELONA 41.39N 2.17E 1015Z 31 OCT WATCH  
SPAIN - CARTAGENA 37.61N 0.94W 1019Z 31 OCT WATCH  
SPAIN - TARRAGONA 41.12N 1.24E 1027Z 31 OCT WATCH  
SPAIN - ALICANTE 38.35N 0.48W 1034Z 31 OCT WATCH  
SPAIN - ALMERIA 36.84N 2.47W 1039Z 31 OCT WATCH  
SPAIN - VALENCIA 39.47N 0.38W 1055Z 31 OCT WATCH  
SPAIN - MELILLA 35.29N 2.94W 1056Z 31 OCT WATCH  
SPAIN - CASTELLONDELAPLANA 39.98N 0.03W 1056Z 31 OCT WATCH  
SPAIN - MALAGA 36.72N 4.42W 1106Z 31 OCT WATCH  
SPAIN - CEUTA 35.89N 5.32W 1110Z 31 OCT WATCH  
SPAIN - ALGECIRAS 36.18N 5.40W 1112Z 31 OCT WATCH  
SPAIN - CADIZ 36.53N 6.29W 1211Z 31 OCT WATCH  
SPAIN - HUELVA 37.26N 6.95W 1239Z 31 OCT WATCH  
ITALY - QUARTO SANT ELENA 39.21N 9.27E 0949Z 31 OCT WATCH  
ITALY - ALGHERO 40.54N 8.31E 0958Z 31 OCT WATCH  
ITALY - CARLOFORTE 39.15N 8.31E 1000Z 31 OCT WATCH  
ITALY - ORISTANO 39.86N 8.44E 1005Z 31 OCT WATCH  
ITALY - CAGLIARI 39.21N 9.11E 1006Z 31 OCT WATCH  
ITALY - PONZA 40.88N 12.95E 1014Z 31 OCT WATCH  
ITALY - OROSEI 40.44N 9.78E 1016Z 31 OCT WATCH  
ITALY - CALA LIBEROTTO 40.44N 9.79E 1016Z 31 OCT WATCH  
ITALY - SANTA TERESA DI GALLURA 41.25N 9.19E 1019Z 31 OCT WATCH  
ITALY - PALERMO 38.22N 13.34E 1020Z 31 OCT WATCH  
ITALY - IMPERIA 43.88N 8.02E 1021Z 31 OCT WATCH  
ITALY - GINOSTRA 38.78N 15.19E 1024Z 31 OCT WATCH  
ITALY - PORTO TORRES 40.84N 8.40E 1024Z 31 OCT WATCH  
ITALY - MARINA DI ANDORA 43.95N 8.15E 1026Z 31 OCT WATCH  
ITALY - GENOVA 44.41N 8.93E 1030Z 31 OCT WATCH  
ITALY - GORGONA 43.57N 9.96E 1030Z 31 OCT WATCH  
ITALY - ANZIO 41.45N 12.63E 1031Z 31 OCT WATCH  
ITALY - PALINURO 40.03N 15.28E 1032Z 31 OCT WATCH  
ITALY - CIVITAVECCHIA 42.06N 11.81E 1033Z 31 OCT WATCH  
ITALY - GAETA 41.21N 13.59E 1034Z 31 OCT WATCH  
ITALY - NAPOLI 40.84N 14.27E 1035Z 31 OCT WATCH  
ITALY - MILAZZO 38.21N 15.27E 1036Z 31 OCT WATCH  
ITALY - CETRARO 39.49N 15.94E 1036Z 31 OCT WATCH  
ITALY - SALERNO 40.68N 14.75E 1037Z 31 OCT WATCH  
ITALY - FIUMICINO 41.75N 12.50E 1038Z 31 OCT WATCH  
ITALY - VIBO MARINA 38.21N 15.27E 1036Z 31 OCT WATCH  
ITALY - MAZARA DEL VALLE 37.05N 13.06E 1038Z 31 OCT WATCH  
ITALY - MESSINA 38.26N 15.30E 1039Z 31 OCT WATCH  
ITALY - CATANZARO 38.50N 16.11E 1040Z 31 OCT WATCH  
ITALY - LA SPEZIA 44.06N 10.10E 1041Z 31 OCT WATCH  
ITALY - LERICI 44.06N 10.10E 1041Z 31 OCT WATCH  
ITALY - CASTIGLIONE DI STABIA 38.21N 15.27E 1036Z 31 OCT WATCH

E-MAIL

FAX

GTS

SMS

C/TSP

TWFP,  
C/TSP, CPAs



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# NEAMWave17 Exercise



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## NEAMWave17

### Phase B

**Emergency  
management  
activities  
performed at  
national level**

### Phase C

**International  
assistance  
request and  
provision**



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# Focusing on Phase B...



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**NEAMWave17**

## Why it is important to implement Phase B?

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- To move from an early warning approach towards an early action and response one
- To develop an end-to-end management system of tsunami events (regional, national, local level)
- To raise awareness of launching and contributing to the development of a national policy to tackle the tsunami risk.



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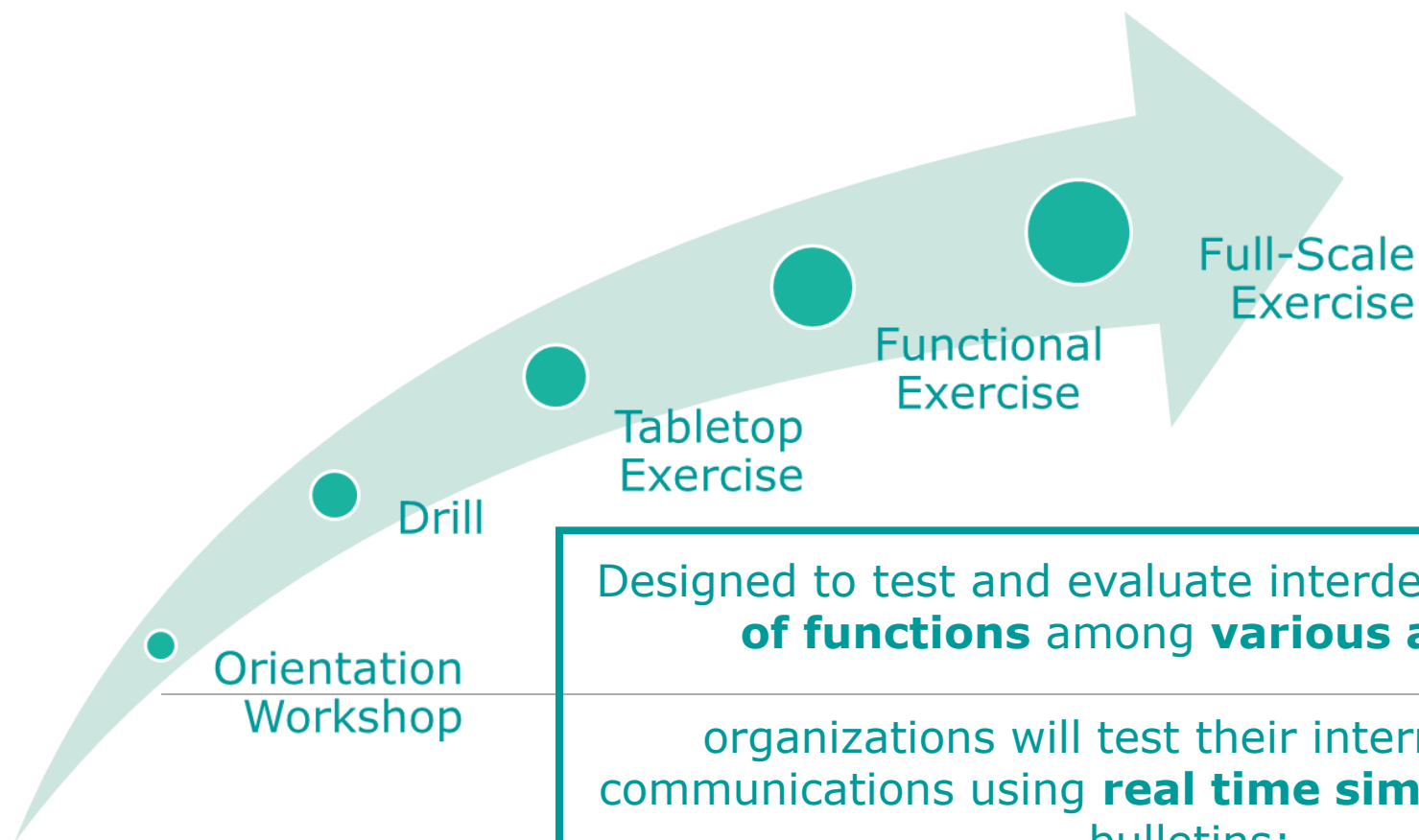
# Focusing on Phase B...



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## NEAMWave17



Designed to test and evaluate interdependent **groups of functions** among **various agencies**;

organizations will test their internal/external communications using **real time simulation** tsunami bulletins;

tests **command and control activities** at locations such as emergency command centers, command posts,...



The city of Antalya in the Mediterranean coast of Turkey was selected for the purposes of the table-top exercise to also benefit from another exercise “HOPEFOR” organized at the same date.

During the drafting of the exercise scenario at the national level, a chemical accident (fire) event was also included in the scenario with the involvement of the Provincial Search and Rescue Team.





- Tsunami exercise in Bartın and Amasra by following tsunami exercise messages sent by KOERI
- Use of IKAS and CANKUŞ high-tech alert Systems for the first time



### FAYDALI BİLGİLER / Tsunamiden Korunma

Deniz kıyısına yakın bir yerleşim yeri seçilirken tsunami riski de diğer afetler gibi dikkate alınmalıdır. Çoğunlukla tsunaminin yaklaştığının ilk işareti büyük bir su duvarı değil, denizin ani olarak geri çekilmesidir. Bu nedenle, denizde ve deniz kıyısında bir deprem hissedildiğinde ve/veya deniz çekilmesi gözlemlendiğinde tsunami tehlikesini hatırlamalıyız.



Tsunamiden korunmak için şunları yapın:

Tehlikeyi hissettiğinizde hemen ve hızla yüksek yerlere doğru gidip deniz kıyısından uzaklaşın.  
Depremden sonra olası bir tsunami uyarısı için radyo dinleyin ve uyarı yapıldığında deniz kıyısından yüksek yerlere doğru uzaklaşın.  
Tsunami sırasında denizde ve kıyıya dönemeyecek durumdaysanız kıyıdan uzaklaşarak derinliği 50 m ve üzerinde olan yerlere gidin.



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# Focusing on Phase C...



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## Why it is important to implement Phase C?

- To test procedures for international assistance between the European Commission and participating Member States

Phase C of the NEAMWave17 exercise will be performed only for the Western Mediterranean scenario (launched by CENALT).

The ERCC will receive one or more requests for international assistance from one or more affected countries according to the scenario. The request for assistance will activate the Union Civil Protection Mechanism (UCPM).



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# NEAMWave17: HOW TO PARTICIPATE



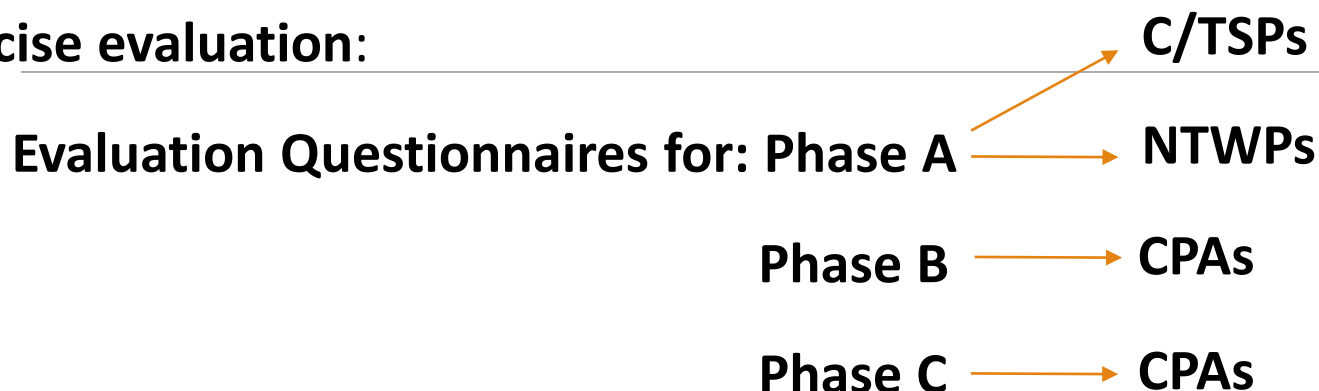
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## NEAMWave17

- **Second Circular Letter will be sent by UNESCO-IOC together with the exercise manual including exercise scenario documents soon!**
- **Application form to be sent on 30/09/2017**
- **Preparatory actions to participate: exercise manual**
- **During NEAMWave17 exercise: helpdesk available (email; landline)**

- **Exercise evaluation:**





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# NEAMWave17 Manual



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## NEAMWave17

Intergovernmental Oceanographic Commission

Technical Series

134



### Tsunami Exercise NEAMWave17

**A Tsunami Warning and  
Communication Exercise for the North-  
eastern Atlantic, the Mediterranean,  
and Connected Seas Region**

**31 October – 3 November 2017**

**Volume 1      Exercise Instructions**

UNESCO

Prepared by Task Team on Tsunami Exercise  
NEAMWave17: Ceren Özer Sözdinler; Eleonora  
Panunzi, Olimpia Imperiali; Öcal Necmioğlu;  
Marzia Santini; Marinos Charalampakis, Ahmet  
Cevdet Yalçiner.

Based on NEAMWave14 Manual with  
contribution of Jörn Behrens; Fernando Carrilho;  
Emilie Crochet; Mauricio Gonzalez; Trevor  
Guymer; Olimpia Imperiali; Luis Manuel Matias;  
Nikolaos Melis; Öcal Necmioğlu; Marzia Santini;  
Ahmet Cevdet Yalçiner and with contribution of  
DG ECHO Emergency Response Coordination  
Centre of the European Commission.



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Thank you!  
Şükran!



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