# Tsunami Exercise NEAMWave11

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

## 8-10 March 2021


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# What is NEAMWave?



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

Message Providers (Tsunami Service Providers-**TSP**s) 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**.

# Scope of NEAMWave

**PHASE A**

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

**PHASE B**

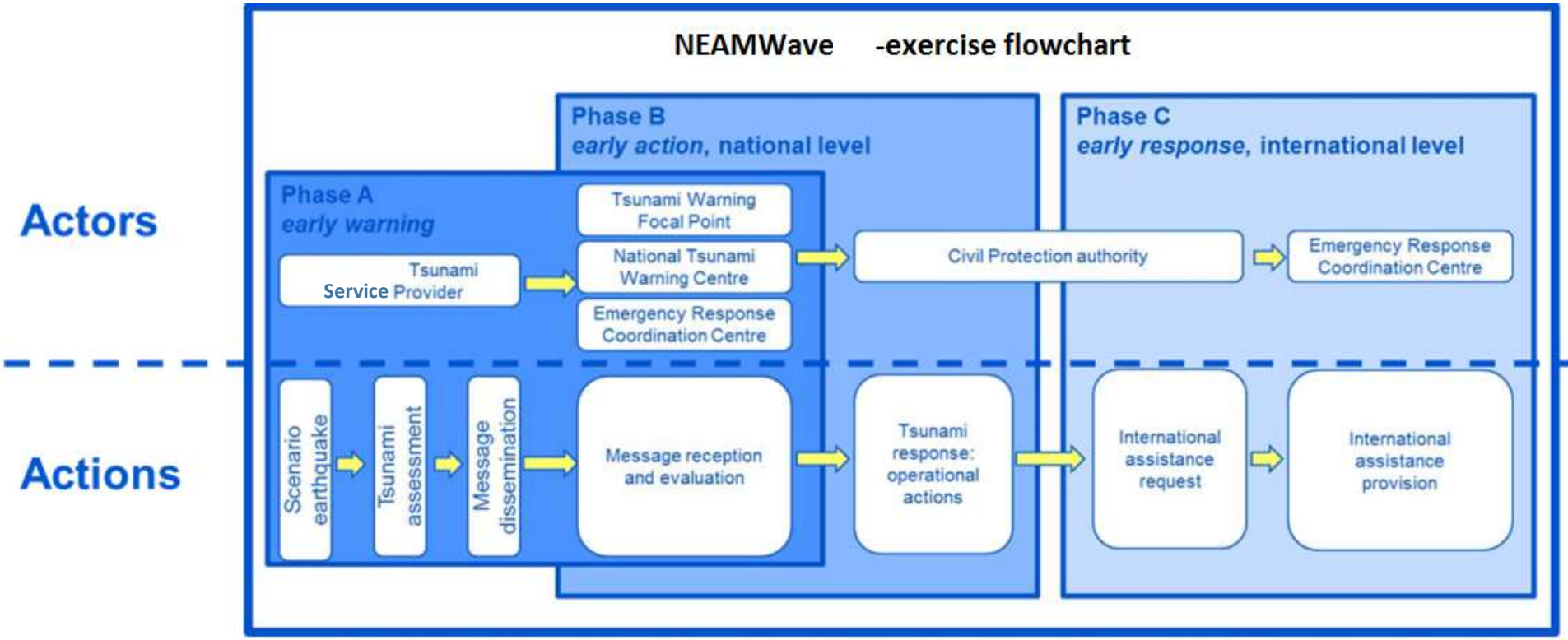
**National Tsunami Warning Centres (NTWCs) and Civil Protection Agencies (CPAs)** …..to practice their emergency response procedures in order to ensure that (i) vital communication links work seamlessly, and that (ii) agencies and response personnel know the roles that they will need to play during a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

**PHASE C**

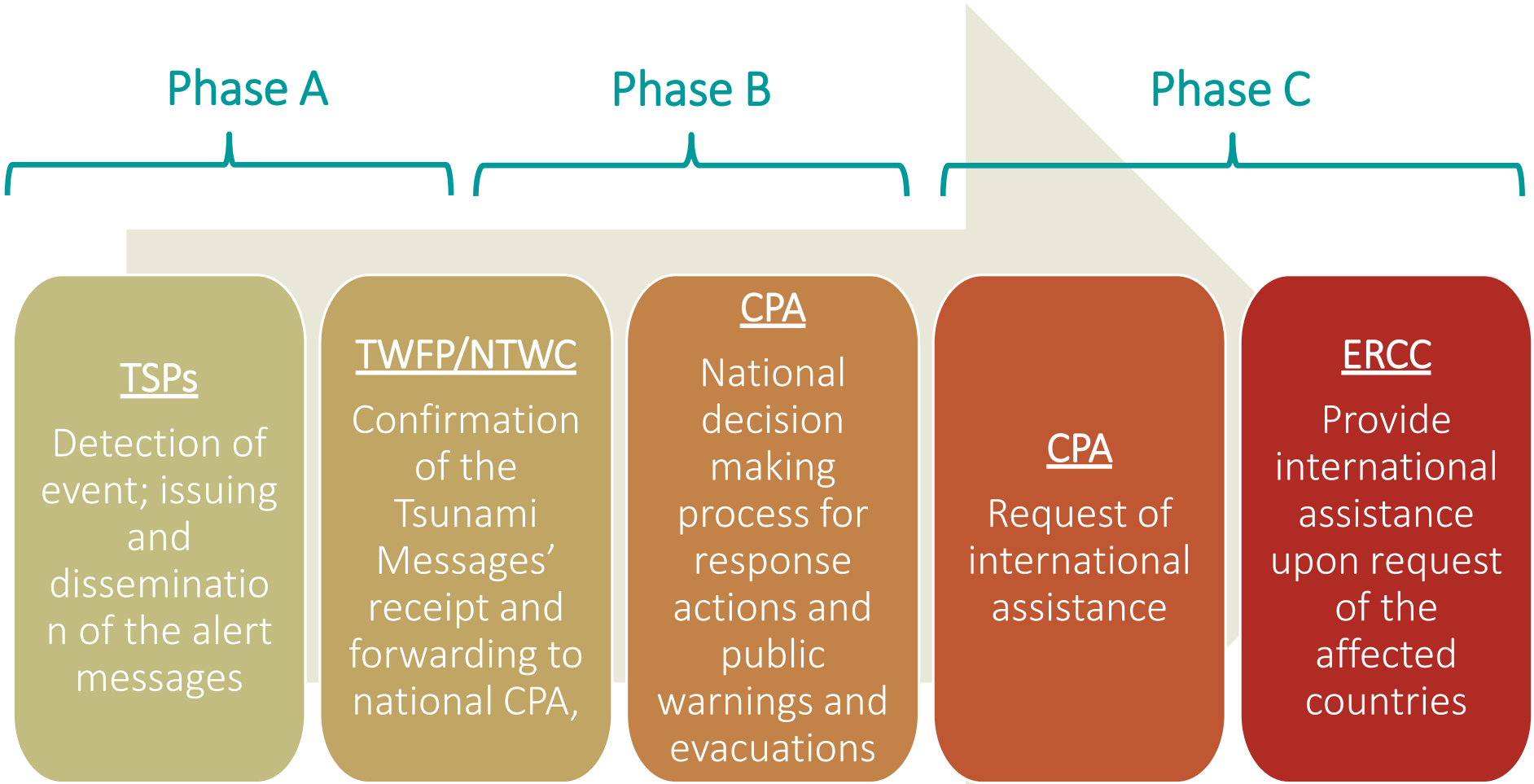
**Emergency Response Coordination Center (ERCC)** ….. to practice their emergency response procedures in order to provide international assistance upon request.

# NEAMWaveFlowchart





# NEAMWave Phases



# Phase A: Tsunami Alert Message Dissemination

United Nations Educational, Scientific and Cultural Organization

Intergovernmental Oceanographic Commission

ICG/NEAMTWS TSUNAMI EXERCISE

NEAMWave21

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 TSU AN CAUSE DAMAGE OR MAJOR EFFECT IN T INFORMATION ONLY.

ESTIMATED INITIAL HIN
THE WATCH AREA AR D
THE INITIAL WAVE SUNAMI IS A SERIES O
WAVES
AND THE TIME BETW VE 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
ITALY - VIBO MARINA
ITALY - MAZARA DEL V ATCH
ITALY - MESSINA 38.2
ITALY - LA SPEZIA 44 TCH
ITALY - LERICI 44.06 TCH
ITALY - CASTIGLIONE D Z 31 OCT WATCH

TSP

E-MAIL

FAX

GTS

SMS

TWFP, TSP, CPAs

# NEAMWave Exercise



## Phase B

**Emergency management activities** performed at **national level**

## Phase C

**International assistance** request and provision

# Focusing on Phase B…



## Why it is important to implement Phase B?

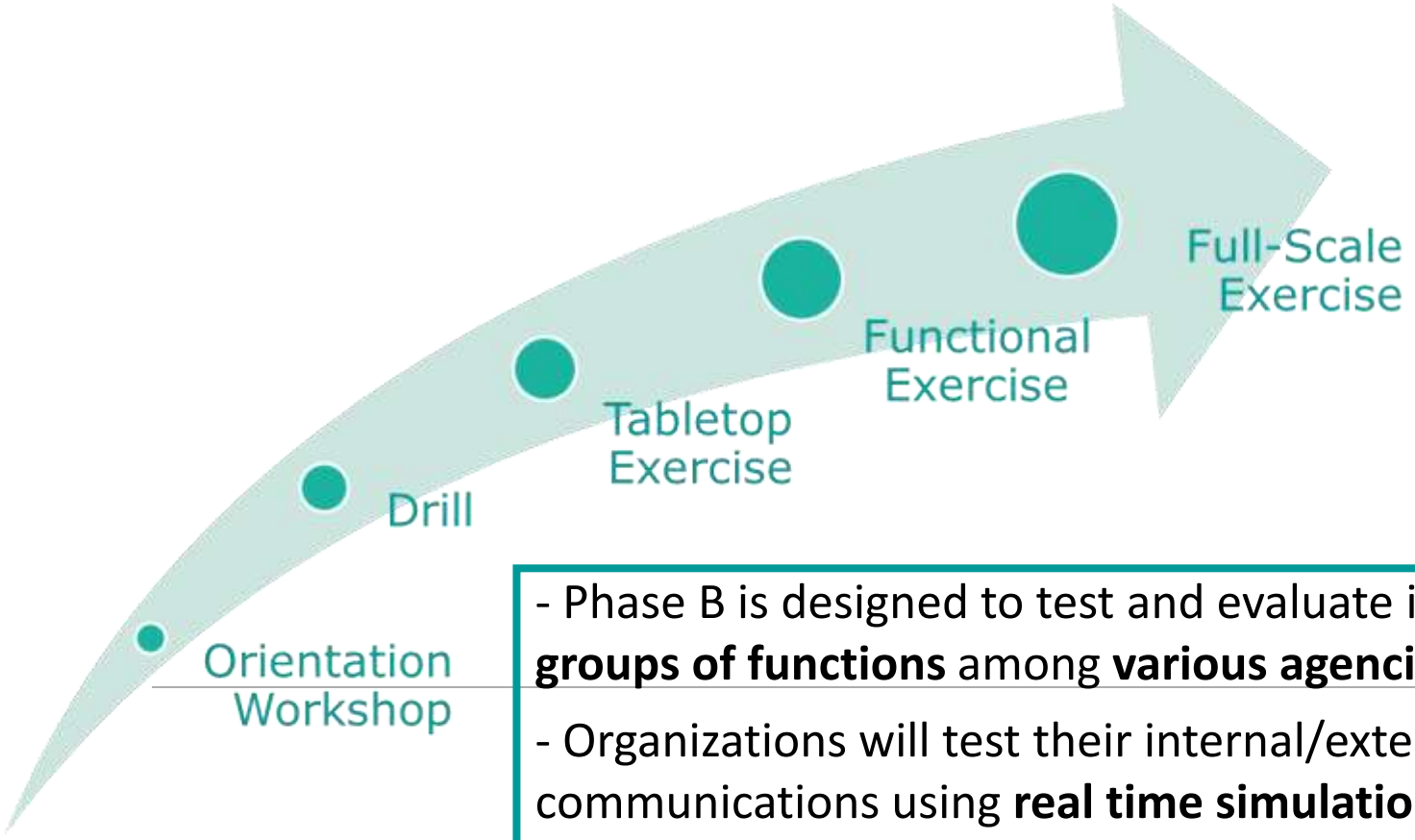
- To move from an early warning approach towards an early action and response one

- 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.

# Focusing on Phase B…






- Phase B is 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;

- Phase B exercises **command and control activities** at locations such as emergency command centers, command posts,…

# Focusing on Phase C…



## 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 was performed for the Western Mediterranean scenario (launched by CENALT).

The ERCC received request for international assistance from Spain according to the scenario. The request for assistance activated the Union Civil Protection Mechanism (UCPM).

# Steps of UCPM Trigering

ERCC receives a request for assistance

rapidly analyses the request and identifies possible needs.

informs the Participating States through the Common Emergency Communication and Information System **(CECIS)**

Participating States specify what they can offer to match the identified needs.

ERCC duty officers are then in a position to contact the affected country to inform of the offers and to seek a formal acceptance

# NEAMWave12 & NEAMWave14 Tsunami Exercises



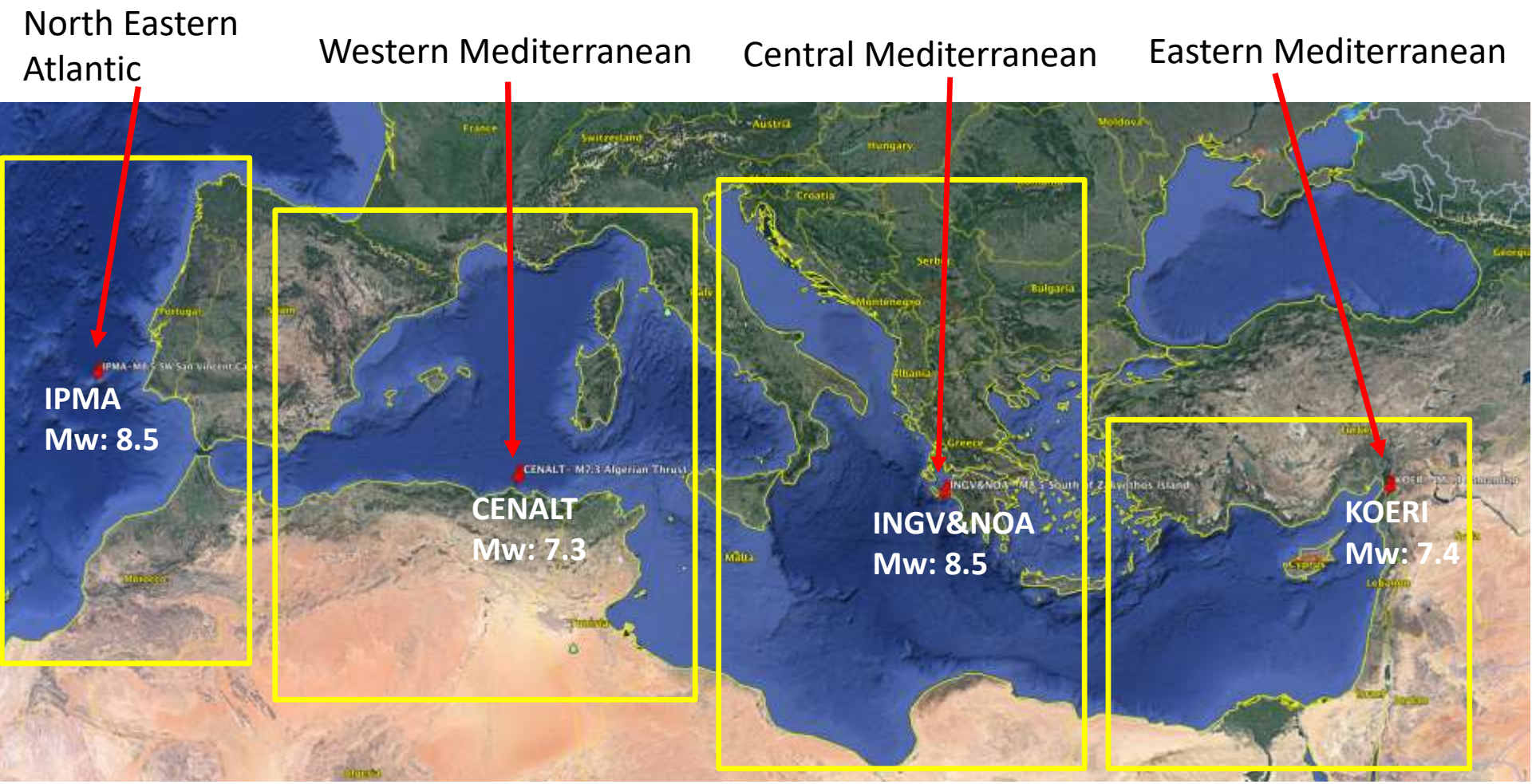
**CENALT (France), NOA (Greece), IPMA (Portugal) and KOERI (Turkey)**
**had disseminated exercise messages as the Message Providers in NEAMWave12 and NEAMWave14.**

ICG/NEAMTWS TSUNAMI EXERCISE
NEAMWave12

ICG/NEAMTWS TSUNAMI EXERCISE
NEAMWave14

**4 different earthquake and tsunami scenarios**

# NEAMWave17 Scenarios




4 Earthquake Scenarios ------ 5 Message Providers

# Phase C participants

| COUNTRY | PHASE C | |
|---|---|---|
| | EASTERN MEDITERRANEAN SCENARIO | |
| | Country requesting international assistance | Country offering international assistance |
| Turkey | | X |
| Spain | X | X |
| Italy | | X |
| Germany | | X |

# Phase C – feedbacks

- Phase C of NEAMWAVE17 went quite well

- All Member States that were registered for Phase C were quite active in exercising CECIS procedures

- CECIS procedures are well known among EU member states

- Phase C would have been more effective if North African civil protection agencies had also taken part to the exercise.

**NEAMWave21 Phase C intends to use IPMA&CENALT joint scenario at NE Atlantic that effects Moroccan coasts.**

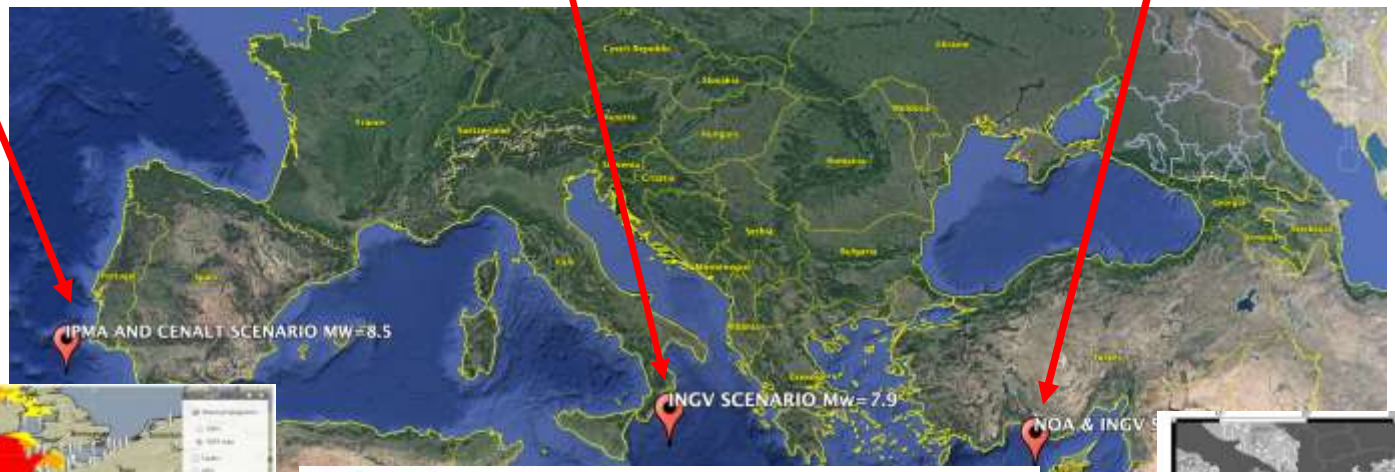
# NEAMWave21 Scenarios

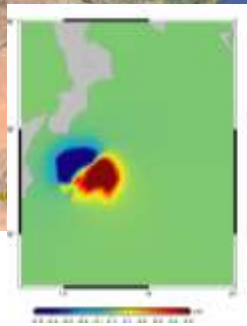


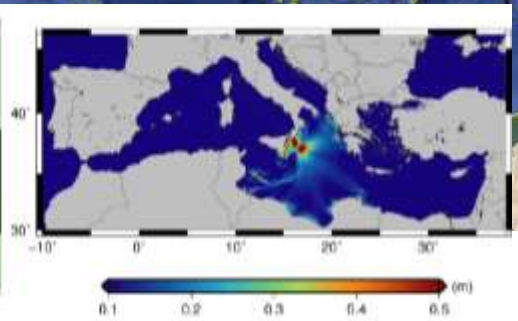
North Eastern Atlantic;
Joint scenario (Mw=8.5)
by IPMA & CENALT

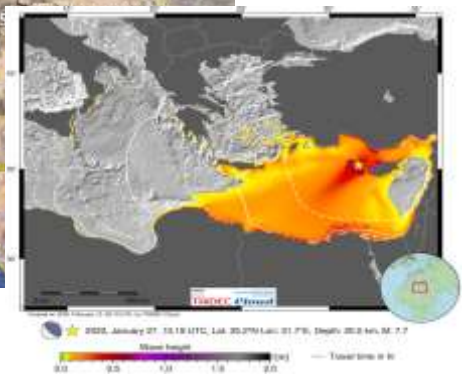
Central Mediterranean;
Single scenario (Mw=7.9)
by INGV

Eastern Mediterranean;
Joint Scenario (Mw=7.7)
by NOA & KOERI





# IPMA&CENALT SCENARIO for PHASE-C

This scenario is based on the 1755 magnitude 8.6 Lisbon earthquake that triggered a major tsunami that impacted greatly Portugal, Morocco and Spain (see Figure NA–1).

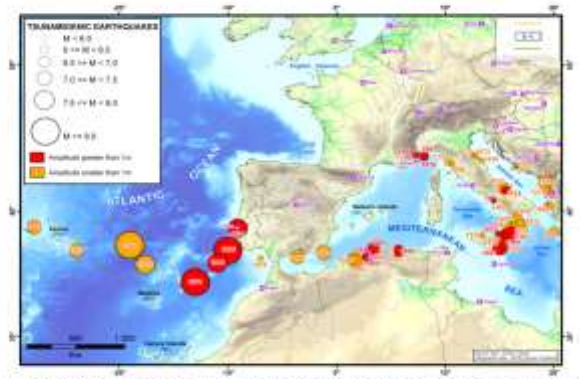


Figure NA–1. Map of the tsunami earthquakes in the North Atlantic and Western Mediterranean, showing the 1755 Lisbon earthquake.

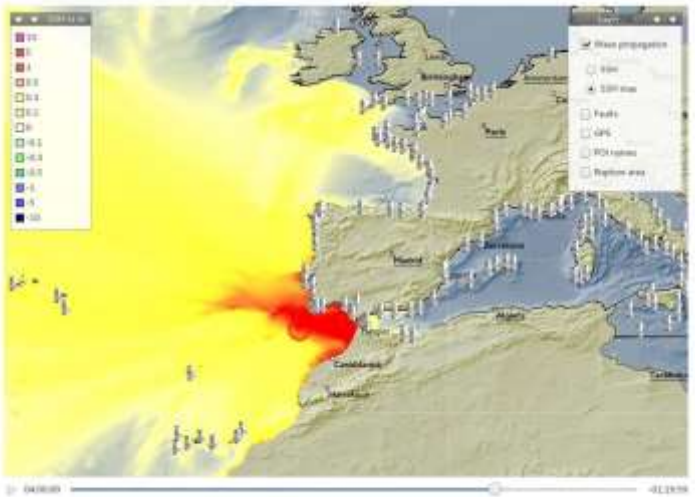


Figure NA–2. Maximum sea level height in deep sea following the 8.5 earthquake

| Earthquake Fault Parameters used by IPMA | |
|---|---|
| Epicenter Location | Longitude : -9.890 |
| (Fault center) | Latitude : 35.574 |
| Dimensions | Length : 170 km |
| | Width : 90 km |
| Slip | 10 m |
| Strike | 42.1° |
| Dip | 35° |
| Rake | 90° |
| Depth to the top of the fault | 5 km |
| Shear modulus | 6.5 e+10Pa |
| Moment magnitude | 8.6 |

Table NA–1. Earthquake Fault Parameters used by IPMA

IPMA-CENALT scenario offshore Gibraltar foresees about 3.5 m wave height offshore Casablanca, Morocco.

Request of assistance from Morocco will be the best option in Phase C.

United Nations
Educational, Scientific and
Cultural Organization

Intergovernmental
Oceanographic
Commission

ICG/NEAMTWS
TSUNAMI EXERCISE
NEAMWave21

# Thanks for your kind attention!

# Types of Phase B Exercises



**Orientation Workshop:**

- Can be conducted through a workshop.
- Used to familiarise the players with the activity.
- There is no time-frame element; the orientation exercise could be performed after the exercise, making use of the NEAMWave17 material (i.e. Exercise manual, exercise scenarios) to conduct the workshop planned at national level.
- An example of an orientation exercise would be setting up a welfare centre to take in tsunami evacuees, and briefing to the staff about how the centre is organized.
- This kind of exercise would provide an opportunity to raise awareness among the **National Emergency Operations Centre(s)** and response officials regarding the NEAMTWS programme

# Types of Phase B Exercises



## Drill:

- Staff physically handle specific equipment or perform a specific procedure or single operation.
- A drill usually focuses on a single organization, facility or agency such as a national emergency operation centre, hotel, school or village.
- The exercise usually has a time-frame element and is used to test procedures.
- A drill is a subset of a full-scale exercise.
- An example of a drill exercise would be activating an **Emergency Operations Centre** (EOC), testing the relative procedures and all the communications technologies foreseen for the activation of those procedures (i.e. Email, telephone, radios) in a tsunami exercise.
- In NEAMWave17, Phase A will be conducted as a drill exercise; the ability to send multiple consecutive tsunami messages by the C/TSPs will be tested.

# Types of Phase B Exercises



## Tabletop Exercise:

- May also be referred to as a ‘‘discussion exercise’’, or ‘‘DISCEX’’.
- Participants face with a situation or problem that they are required to discuss and they formulate the appropriate response or solution.
- An exercise controller or moderator introduces a simulated scenario (prewritten exercise) to participants and, as the exercise advances (in time), exercise problems and activities are further introduced.
- This type of exercise is used to practice problem-solving and coordination of services with or without time pressures.
- There is no deployment or actual use of equipment or resources.
- An example of a table top exercise may cover the participants discussing their response to a tsunami threat to a particular area, where the only input are tsunami messages from the C/TSPs.

# Types of Phase B Exercises



## Functional Exercise:

- May also be referred to as an ‘‘operational’’ or a ‘‘tactical’’ exercise.

- It takes place in an operational environment and requires participants to actually perform the functions of their roles.

- Participants interact within a simulated environment through an exercise control group which provides prewritten actions and respond to questions and tasks developing out of the exercise.

- Functional exercises normally involve multi-agency participation (real or simulated) and can focus on one or more geographical areas.

- Commonly, they involve the testing of standard operating procedures (SOP) and internal/external communications between organizations.

- It lacks only the people "on the ground" to create a full-scale exercise

- An example would be a multi-agency response to a potentially devastating tsunami, where evacuation of a coastal community is required. Messages and actions are provided by exercise control group and are handled by the participants in the way described in appropriate plans and procedures.

# Types of Phase B Exercises



## Full-scale Exercise:

- May also be referred to as a “practical’’ or ‘‘field’’ exercise.

- It includes the movement or deployment of people and resources to provide a physical response ‘‘on the ground’’ to a simulated situation.

- It can be ‘‘ground’’ focused only or may include the higher-level response structures. It can be simple (single agency) or complex (multi agency, multi-levels of government from national to local).

- Typically used to test all aspects of a country's warning and emergency management systems and processes; they are practical, using actual centres and communications methods.

- Full-scale exercises are the largest, most costly, most time-consuming and most complex to plan, conduct and evaluate.

- An example: a post-impact tsunami response with volunteers representing 'victims' and the emergency services using real rescue equipment at the scene. Multi-agency response to the event is played. Actual field mobilization and deployment of response personnel are also involved.