

«The exercise NEAMWave14, 28-30 October 2014»



Task Team on Tsunami Exercise of the
ICG/NEAMTWS
with the contribution of
DG ECHO Emergency Response Coordination
Centre of the European Commission

Exercises in the IOC¹ tsunami programme framework

- **Aim:** maintain and increase tsunami preparedness and awareness of coastal communities
- **Challenge:** relative infrequency of tsunamis, but widespread impact in case of event (**perception issue**)
- **Objectives:**
 - *Test and evaluate* communications and standard operating procedures of regional² and national tsunami warning systems
 - *Maintain* staff familiarity and efficiency for the real event
 - *Promote* emergency preparedness at local level
 - *Increase* tsunami awareness of communities

1) Intergovernmental Oceanographic Commission of UNESCO

2) NEAMTWS Interim Operational Users Guide for the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and Connected Seas, Version 1.9 (http://ioc-unesco.org/index.php?option=com_oe&task=viewDocumentRecord&docID=12077)

Exercises in the IOC tsunami programme framework

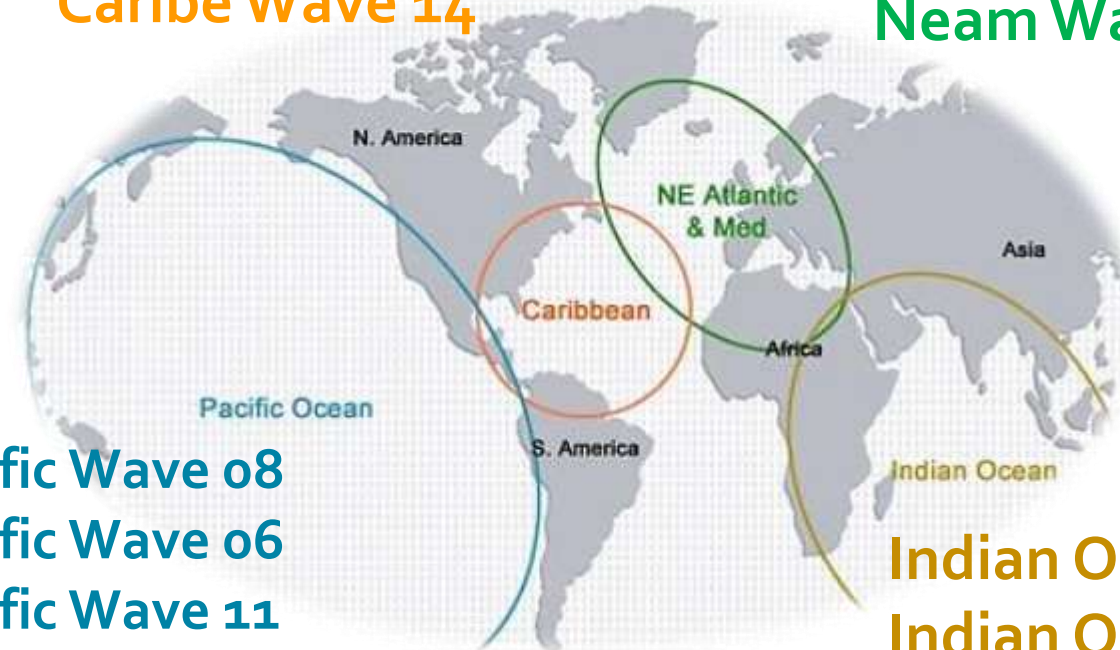
Caribe Wave 11

Caribe Wave 13

Caribe Wave 14

Neam Wave 12

Neam Wave 14



Exercise Pacific Wave 08

Exercise Pacific Wave 06

Exercise Pacific Wave 11

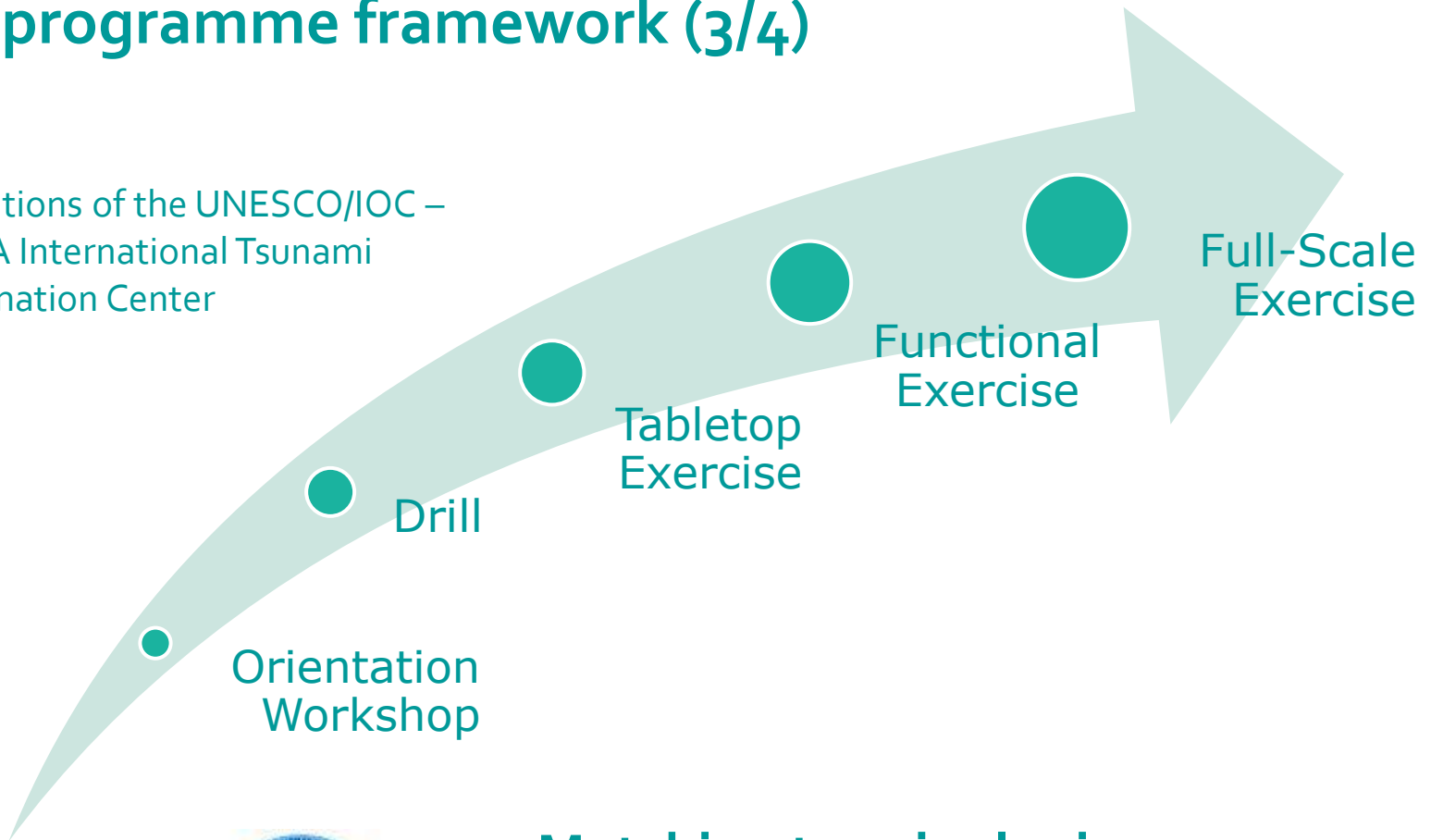
Exercise Pacific Wave 13

Indian Ocean Wave 09

Indian Ocean Wave 11

Exercises in the IOC tsunami programme framework (3/4)

Definitions of the UNESCO/IOC –
NOAA International Tsunami
Information Center



Matching terminologies...
"tabletop/functional exercise" ≈
"command post exercise"



NEAMWave12 exercise, 27-28 November 2012

First, very positive and constructive, exercise of the ICG/NEAMTWS

- **reference documents to support the exercise planning and conduction** (manual, scenario guidelines, evaluation templates,...)
- **4 scenarios:** activity lasted for 2 to 3 hours each day
- **A number of issues were identified** that resulted in a series of **recommendations** regarding:
 - exercise preparation and documentation
 - Exercise conduction

NEAMWave14 exercise objectives

- Validate and evaluate
 - issuing and dissemination of tsunami warning messages (CTWP)
 - procedures for countries to receive and confirm the Tsunami Messages (NTWC, TWFP, TNC)
- Test the dissemination of the warning messages at national scale (from NTWC/TWFP/TNC to Civil Protection Agency)
- Assess the organizational decision making process about public warnings and evacuations at national level
- Identify best practices (to be shared) and room for improvements (to be addressed)
- Test procedure for international assistance between the European Commission and the participants.

NEAMWave14 exercise steps

Phase A

detection of event and the timely provision of **alert messages**

Phase B

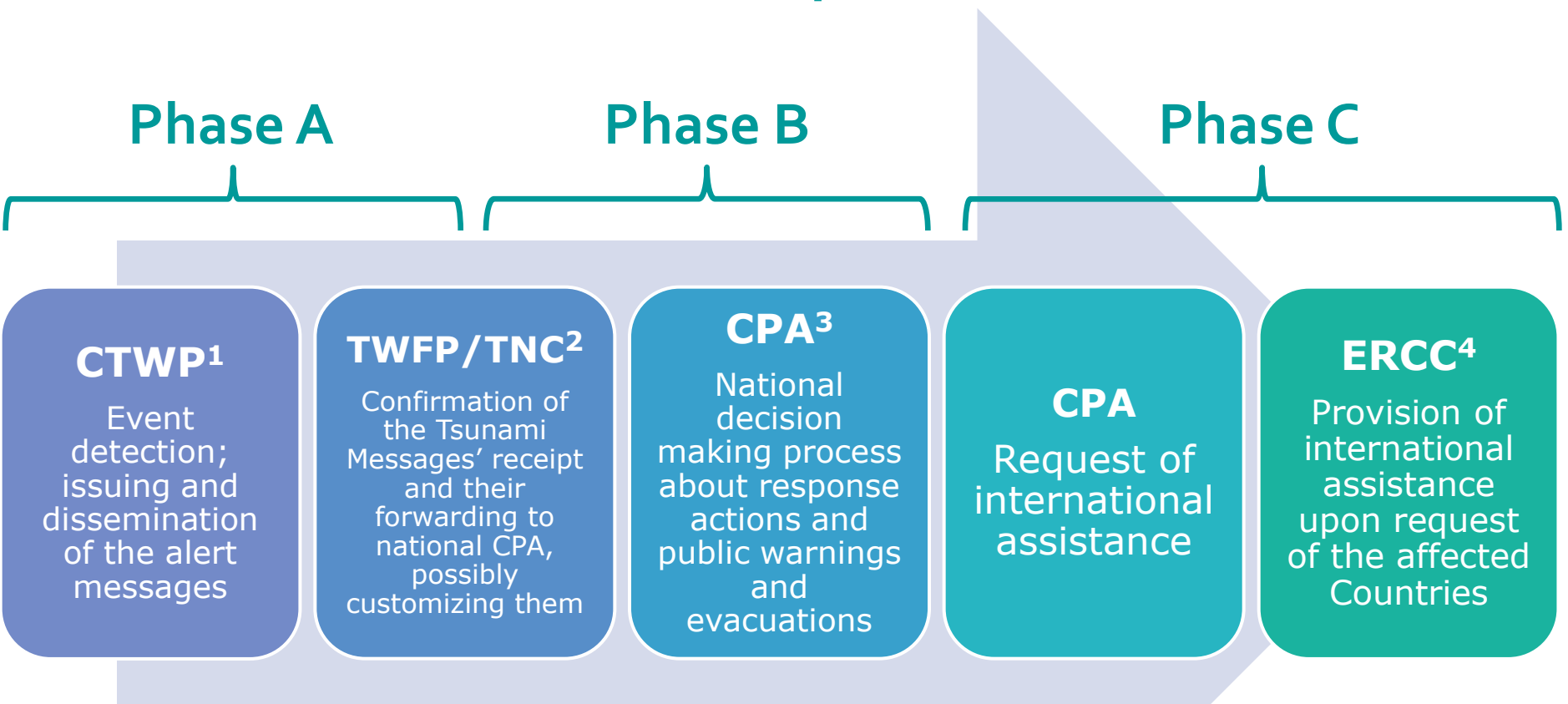
Emergency management activities performed at **national level**

Phase C

International assistance request and provision



NEAMWave14 exercise steps



- 1) Candidate Tsunami Watch Provider = TSUNAMI WATCH PROVIDERS
 - 2) Tsunami Warning Focal Point/Tsunami National Contact
 - 3) Civil Protection Agency
 - 4) Emergency Response and Coordination Centre
- } = TSUNAMI WATCH RECEIVERS

NEAMWave14 exercise scenarios

Instituto Português do Mar e da Atmosfera

Kandilli Observatory and Earthquake Research Institute

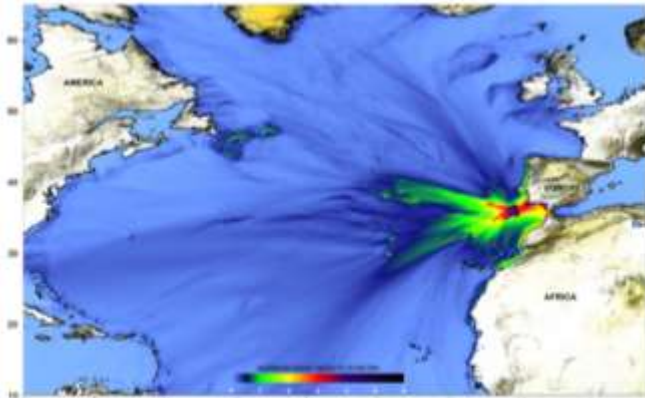
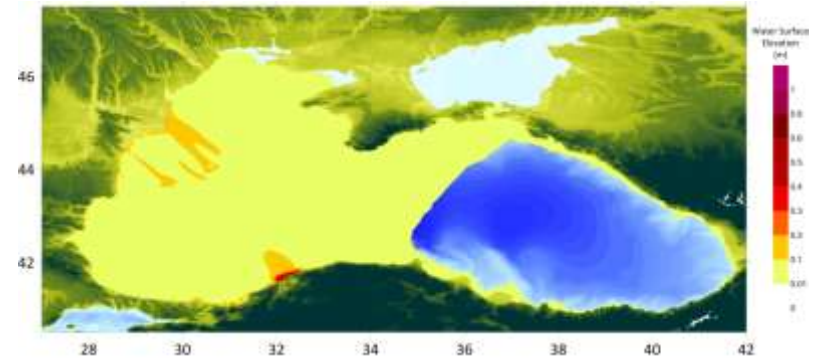
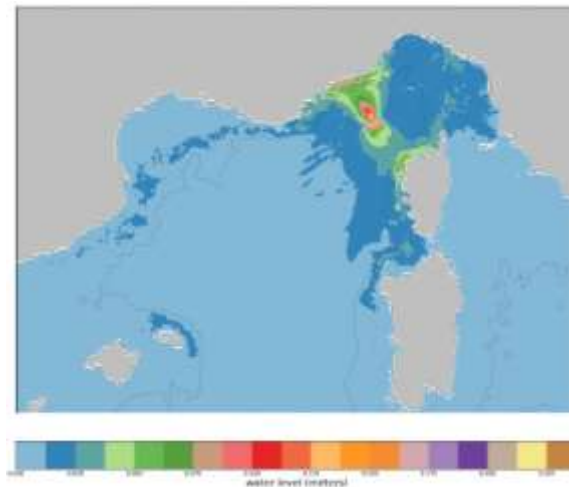


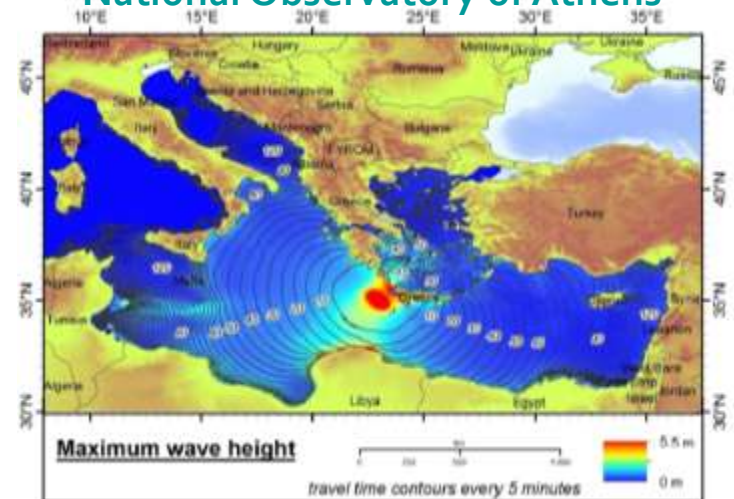
Figure 3: NEAMWave14 Scenario: Tsunami Maximum Wave Heights distribution



CENtre d'Alerte aux Tsunamis



National Observatory of Athens



NEAMWave14 exercise scenarios

- scenarios based on a **computer-simulated event**
- based on a **credible worst-case** or a substantially damaging case
- key features:
 - earthquake origin time, location and magnitude
 - 3 plots, describing the characteristics of the wave dispersion:
 - An isochrone chart with arrival time iso-lines.
 - A wave energy plot with maximum wave heights for the entire domain.
 - A map, indicating coastal hazard levels according to the agreed levels.
 - A brief timeline explaining the standard operational procedures applied by the CTWP
 - The complete set of tsunami alert messages that will be issued during the exercise.
 - list of forecast points where **arrival times and wave heights** are given

NEAMWave14: tsunami alert messages

Message Type	Tsunami Wave	Effects on the coast
Tsunami Watch	Tsunami wave height greater than 0.5m and/or tsunami run-up greater than 1m	Coastal inundation
Tsunami Advisory	Tsunami wave height less than 0.5m and/or tsunami run-up less than 1m	Currents, Bore, recession, damage in harbours, small inundation on beaches

PLUS: Tsunami Information is a message issued to advise the NEAM recipients of the occurrence of a major earthquake in the area but with an evaluation that there is no tsunami threat.

IN EACH MESSAGE THE LEVEL OF ALERT IS SPECIFIED FOR EACH FORECAST POINT ALONG THE INTERESTED COASTS

NEAMWave14: tsunami alert messages

IN EACH
REFERENCE
SCENARIO YOU
WILL FIND ALL
THE TSUNAMI
ALERT
MESSAGES THAT
WILL BE SENT
DURING THE
EXERCISE and
THEIR SEQUENCE
OF
DISSEMINATION

Master Schedule of Events List

T[^{min}]

- T0:** EQ Origin Time
- T3: EQ Parameters (mag, lat, lon, depth, origin time)
- T4: Tsunami Assessment based on the decision matrix
- T5:** **Dissemination of the 1st Message**
- T6: Sea-level measurement at AMASRA Station confirms TSUNAMI
- T7: Eye-witness reports on Earthquake Damage
- T15:** **Dissemination of the 2nd message (ONGOING)**
- T27: Eyewitness reports from ZONGULDAK confirm TSUNAMI
- T46: Eyewitness reports from KEFKEN confirm TSUNAMI
- T50: Sea-level measurement at KACIVELI Station confirms TSUNAMI
- T54: Sea-level measurement at SINOP Station confirms TSUNAMI
- T60:** **Dissemination of the 3rd message (ONGOING)**
- T70:** Eyewitness reports from EREGLI and AKCAKOCA confirm TSUNAMI
- T104: Sea-level measurement at CONSTANTIA Station re-confirms TSUNAMI
- T110:** **Dissemination of the 4th message (ONGOING)**
- T180:** **Dissemination of the 5th (message (END))**

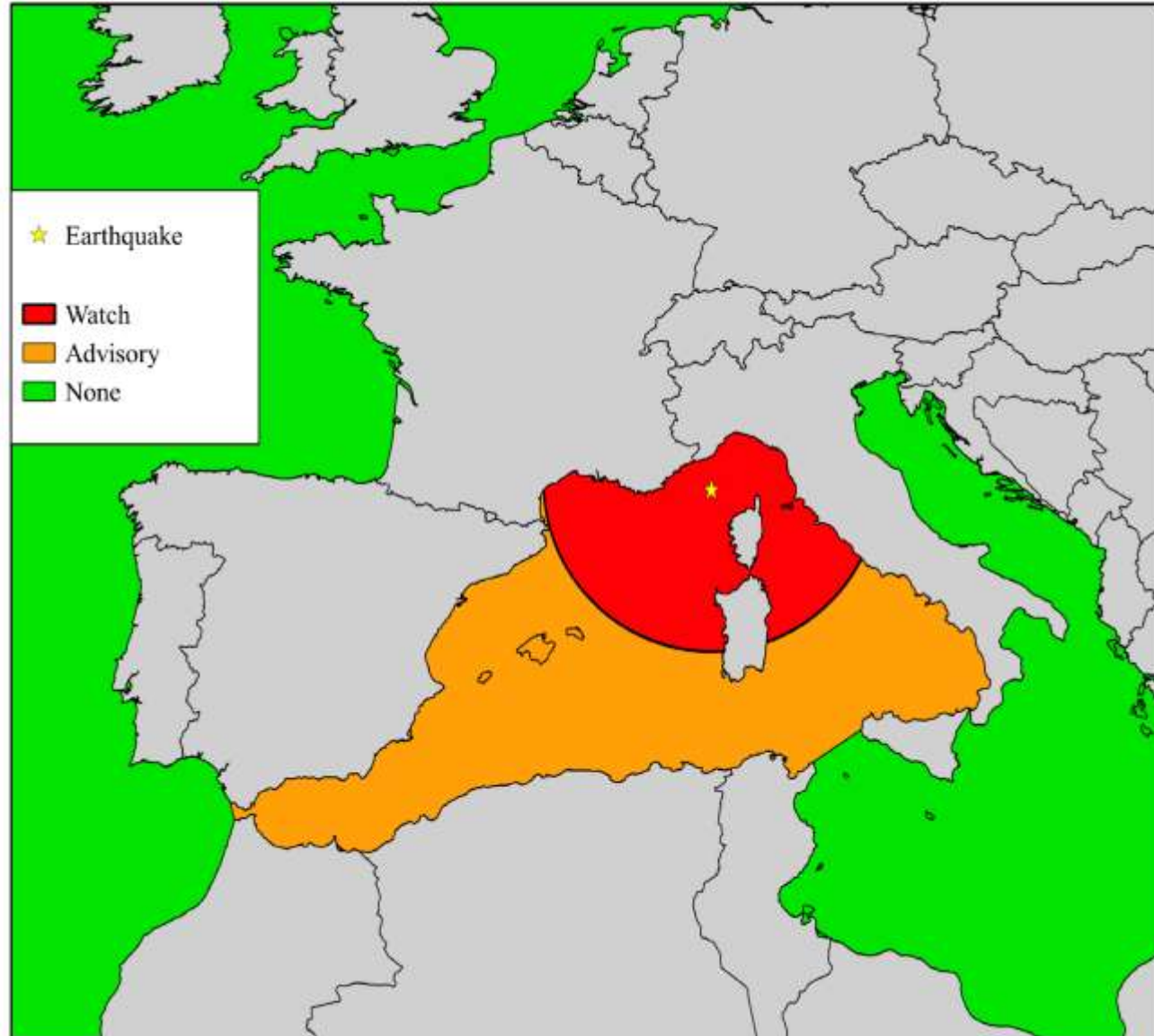
Example from KOERI scenario



Figure 13: The flow chart of message dissemination during NEAMWAVE14

Western Mediterranean Sea

- Longit
- Latitu
- Depth
- Magni
- Slip : 0
- Strike
- Dip : 8
- Rake :
- Half-le
- Width
- Shear



Western Mediterranean Sea

Message	Theoretical sending time	Comments
1	t_0+10'	Message sent 10 minutes after the earthquake occurrence, with earthquake parameters, estimated tsunami arrival times (ETA) and warning levels.
2	t_0+60'	Same message, with the first water-heights measured on tide gauges
3	t_0+180'	End of alert

Western Mediterranean Sea

Message 2:

MEASUREMENTS OR REPORTS OF TSUNAMI WAVE ACTIVITY
GAUGE LOCATION LAT LON TIME AMPL PER

CENT 42.97N 9.35E 0950Z 0.02M 0MN
FIGU 43.48N 6.93E 0948Z 0.02M 0MN

SUPPLEMENT MESSAGES WILL BE ISSUED AS SOON AS NEW DATA AND EVALUATION ALLOWS.
THE TSUNAMI ALERT WILL REMAIN IN EFFECT UNTIL AN END OF ALERT IS BROADCAST.

TSUNAMI EXERCISE MESSAGE NUMBER 002

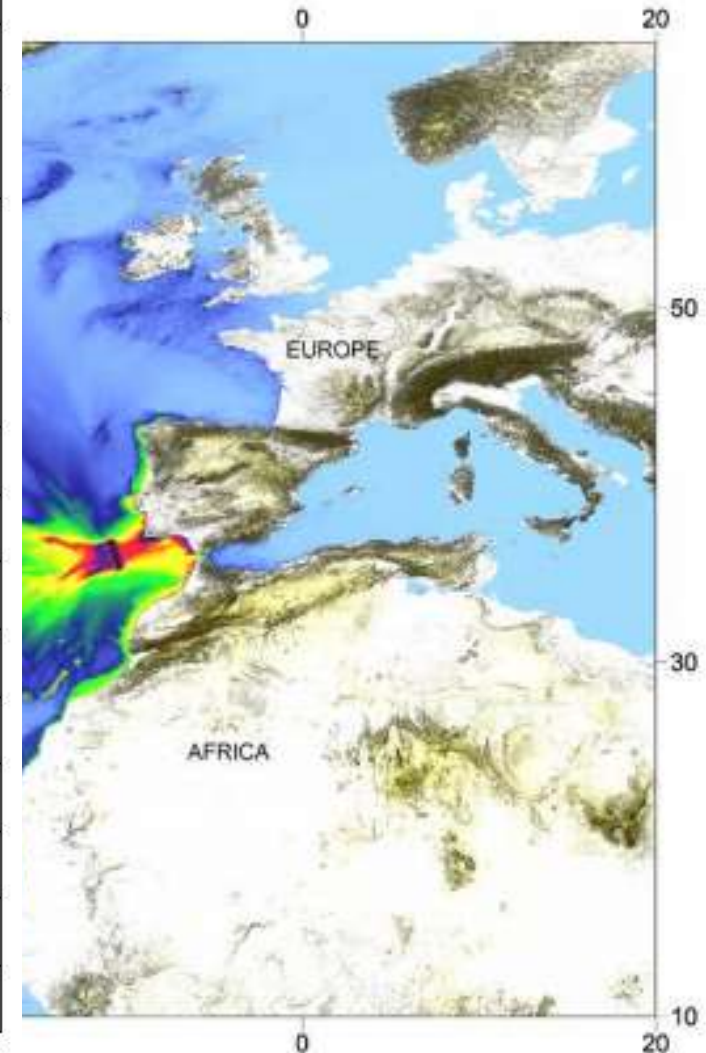
MOROCCO - RABAT 34.04N 6.84W 1341Z 16 APR ADVISORY

SUPPLEMENT MESSAGES WILL BE ISSUED AS SOON AS NEW DATA AND EVALUATION ALLOWS.
THE TSUNAMI ALERT WILL REMAIN IN EFFECT UNTIL AN END OF ALERT IS BROADCAST.

TSUNAMI EXERCISE MESSAGE NUMBER 001

North Atlantic scenario

Time	Events
T0	Earthquake occurs
T0+4m	Initial earthquake parameters (hypocenter and MW) computed: mag 8.5; depth:19km
T0+5m	First evaluation of possible tsunami impact (DM); Issue of first message (#1)
T0+39m	Confirmation of tsunami on the first tide-gauge, Lagos, portuguese mainland SW coast;
T0+43m	Issue of suppl. message (#2)
T0+44m	Tsunami wave arrival to Sines tide-gauge
T0+46m	Tsunami arrival to Cascais tide-gauge
T0+60m	Issue of suppl. message (#3)
T0+1h07m	Tsunami wave arrival to Funchal tide-gauge, Madeira Islands
T0+1h09m	Tsunami wave arrival to Casablanca tide-gauge, Morocco
T0+1h13m	Tsunami wave arrival to Huelva tide-gauge, Spain
T0+2h	Issue of suppl. message (#4)
T0+2h05m	Tsunami wave arrival to Santa Maria tide-gauge, Azores Islands
T0+3h*	Issue of end-tsunami message (#5)



1 Wave Heights distribution

NEAMWave14 scenarios and timing

	28/10/14 morning	28/10/14 afternoon	29/10/14 morning	29/10/14 afternoon	30/10/14 morning
Western Mediterranean scenario (CENALT¹)	Phase A and B				
Black Sea scenario (KOERI²)		Phase A and B			
North East Atlantic scenario (IPMA³)			Phase A and B		
Eastern Mediterranean scenario (NOA⁴)				Phase A and B	Phase C

- 1) CENTre d'ALerte aux Tsunamis
- 2) Kandilli Observatory and Earthquake Research Institute
- 3) Instituto Portugues do Mar e da Atmosfera
- 4) National Observatory of Athens



NEAMWave14 exercise: focus on Phase B

Why it is important to implement a phase B?

- To move from an **early warning** approach toward an **early action and response** one
- To develop an **end-to-end management system** of tsunami events (regional, national, local level)

NEAMWave12, phase B:

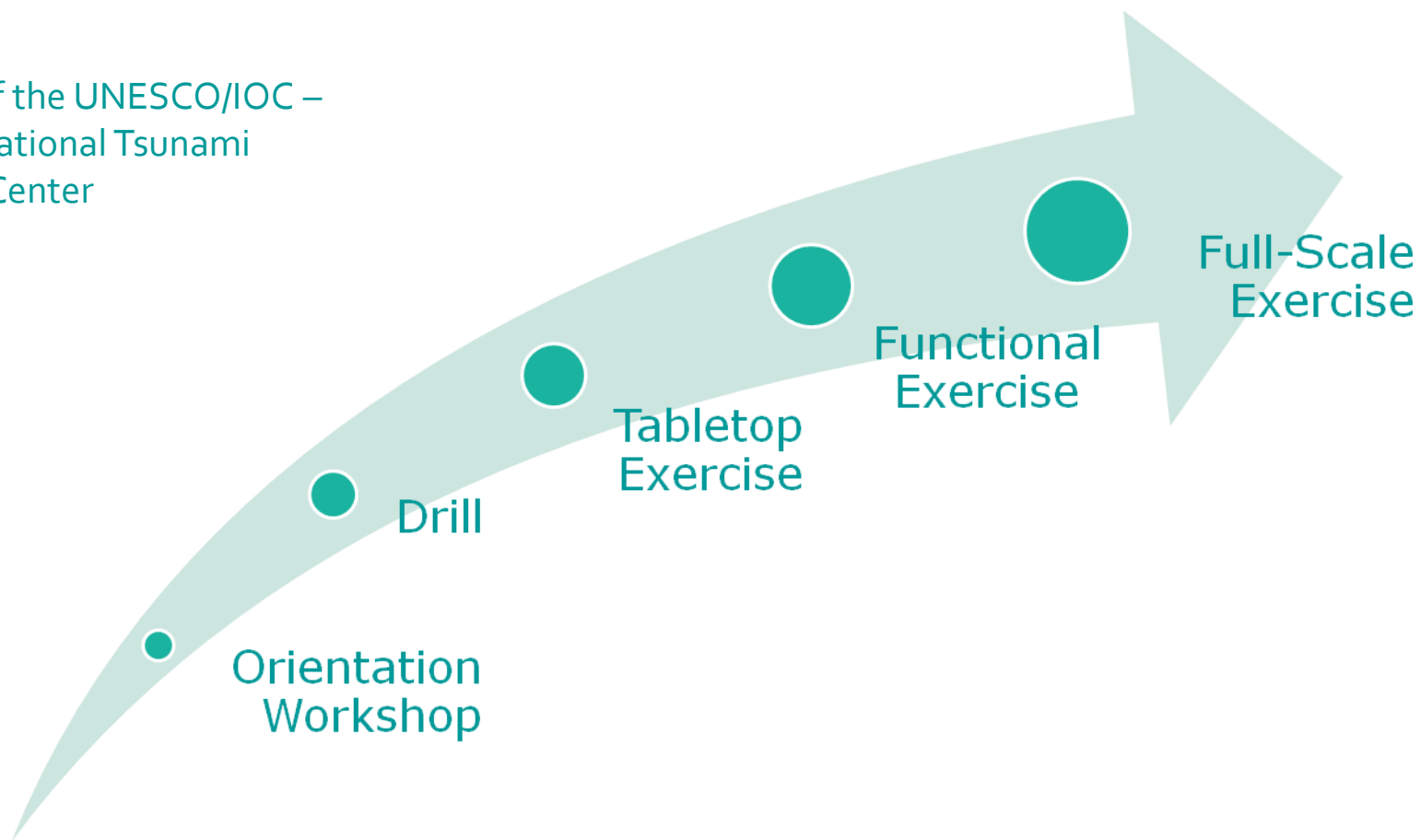
- **5 Member States** (Croatia, Denmark, Germany, Portugal, Turkey)
- from NEAMWAVE12 evaluation: ***"The level of CPA participations is less than expected / desired"***

Different levels of commitment possible in order to implement a phase B at national scale

Possibility of bilateral interaction in preparatory phase with Italian and French civil protections.

Exercises types

Definitions of the UNESCO/IOC –
NOAA International Tsunami
Information Center

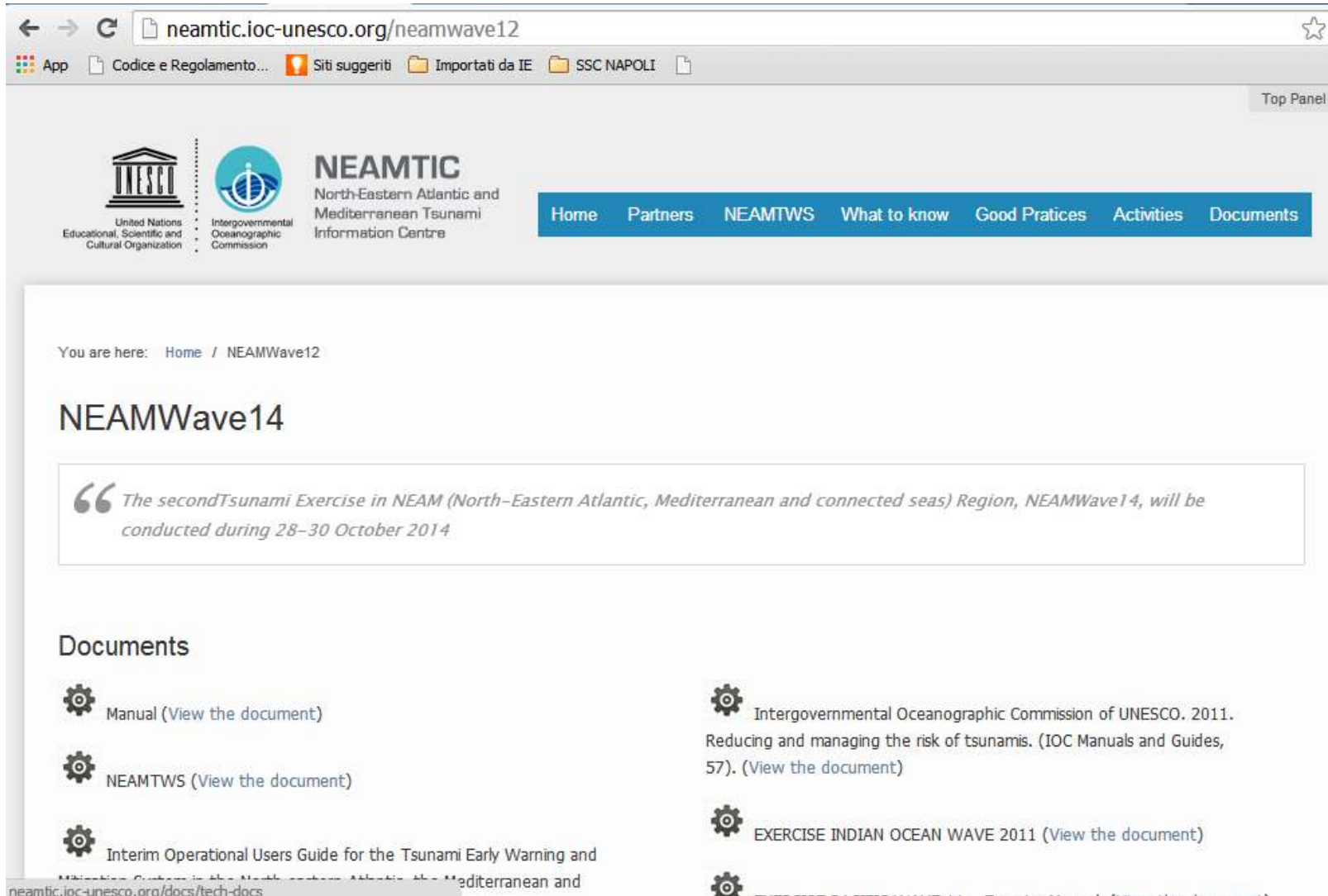


NEAMWave14 exercise: HOW TO PARTICIPATE

- **Application form** to be to IOC Secretariat
- **Preparatory actions** to participate: see [exe manual](#) + contact TT-TE Co-Chairs for support/suggestions/questions if needed
- **Exercise conduction:** [helpdesk available](#) (email; landline)
- **Exercise evaluation:**
 - ANNEX 6. Phase A Evaluation Questionnaire – CTWP
 - ANNEX 7. Phase A Evaluation Questionnaire – NTWC/TWFP/TNC
 - **ANNEX 8. Phase B Evaluation Questionnaire – [CPA within 30 days after ex.](#)**
 - **ANNEX 9. Phase C Evaluation Questionnaire – [CPA within 30 days after ex.](#)**

Exercise documents: where to download

<http://neamtic.ioc-unesco.org/neamwave12>



The screenshot shows a web browser window with the URL neamtic.ioc-unesco.org/neamwave12. The browser's address bar and tabs are visible at the top. The website header features the logos of UNESCO and the Intergovernmental Oceanographic Commission, along with the text "NEAMTIC North-Eastern Atlantic and Mediterranean Tsunami Information Centre". A navigation menu includes links for Home, Partners, NEAMTWS, What to know, Good Practices, Activities, and Documents. Below the header, a breadcrumb trail reads "You are here: Home / NEAMWave12". The main content area is titled "NEAMWave14" and contains a quote: "The second Tsunami Exercise in NEAM (North-Eastern Atlantic, Mediterranean and connected seas) Region, NEAMWave14, will be conducted during 28-30 October 2014". A section titled "Documents" lists several documents with gear icons and links to view them:

- Manual (View the document)
- NEAMTWS (View the document)
- Interim Operational Users Guide for the Tsunami Early Warning and Mitigation System in the North-eastern Atlantic, the Mediterranean and
- Intergovernmental Oceanographic Commission of UNESCO. 2011. Reducing and managing the risk of tsunamis. (IOC Manuals and Guides, 57). (View the document)
- EXERCISE INDIAN OCEAN WAVE 2011 (View the document)

At the bottom left, the URL neamtic.ioc-unesco.org/docs/tech-docs is partially visible.



Exercise documents: where to download

<http://neamtic.ioc-unesco.org/neamwave12>

- Exercise manual
- Application form to participate into the exercise
- Exercise scenarios



Questions?



Thank you for your attention