



NEAMTWS

Tsunami Watch Operations

- Communications Perspective -

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Regional Workshop on Tsunami Warning and Emergency Response for the NE Atlantic, Mediterranean and Connected Seas (NEAMTWS), Rabat, Morocco, 23-24 September 2014

Since July - August 2012

France and Turkey both declared their CTWP status as of 1 July 2012, followed by Greece on 28 August 2012.

Due to their operational status, the systems of these CTWPs are under continuous testing.

FRANCE / CENALT
Centre d'alerte aux tsunamis

GREECE / NOA – HLNTWC
National Observatory of Athens

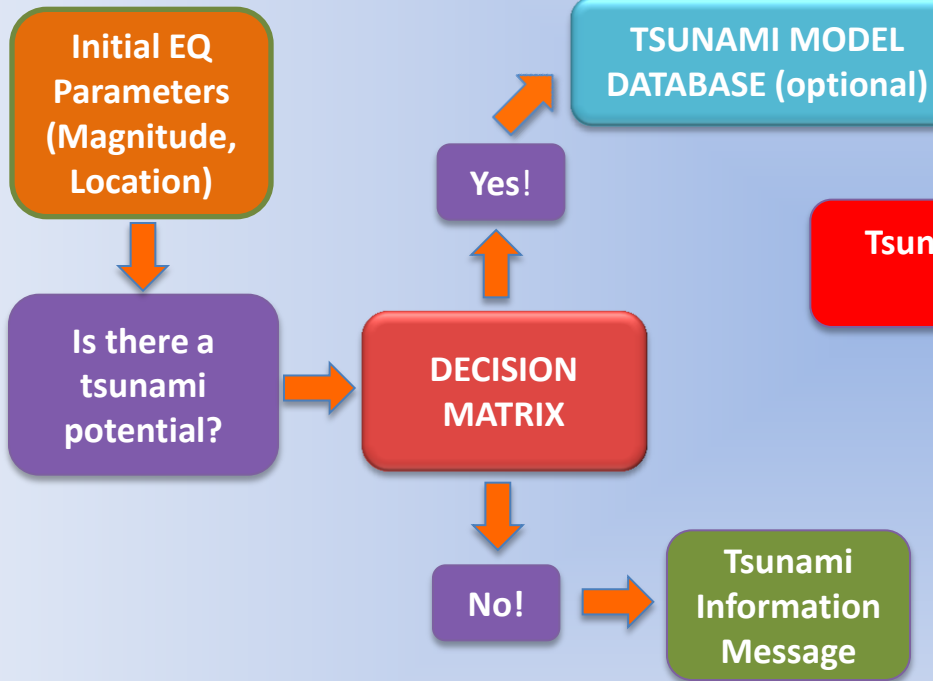
TURKEY / KOERI
Kandilli Observatory and Earthquake
Research Institute

Candidate Tsunami Watch Providers
and from the Member States
Subscribers for receiving TWMs

Standard Operational Procedures

- ✓ Earthquake detection
- ✓ Message dissemination for tsunamigenic events following a Decision Matrix
- ✓ Data analysis: earthquake & sea level
- ✓ Message dissemination with update information
- ✓ Tsunami detection (or not)
- ✓ Message dissemination with alert cancelation or/and declaring the end info
- ✓ Continue monitoring of the various networks

Standard Operational Procedures



Depth (km)	Epicentre location	Earthquake magnitude (M_w)	Tsunami potential	Type of tsunami message		
				Local	Regional	Ocean-wide
< 100	Offshore or close to the coast (≤ 40 km inland)	5.5 – 6.5	Weak potential for a destructive local tsunami	Advisory	Information	Information
		6.5 – 7.0	Potential for a destructive local tsunami	Advisory	Information	Information
	7.0 – 7.5	Potential for a destructive local tsunami	Watch	Advisory	Information	
	7.5 – 7.9	Potential for a destructive regional tsunami	Watch	Watch	Advisory	
		≥ 7.9	Potential for a destructive ocean-wide tsunami	Watch	Watch	Watch
≥ 100	Offshore or inland (≤ 100 km)	≥ 5.5	No tsunami potential	Information	Information	Information

No message if the earthquake is localised inland beyond 100 km distance; no message if $M_w < 6.5$ and distance to the coast > 40 km; no message if $M_w < 5.5$.

Depth (km)	Epicentre location	Earthquake magnitude (M_w)	Tsunami potential	Type of tsunami message		
				Local	Regional	Basin-wide
< 100	Offshore or close to the coast (≤ 40 km inland)	5.5 – 6.0	Weak potential for a local destructive tsunami	Advisory	Information	Information
		6.0 – 6.5	Potential for a destructive local tsunami	Watch	Advisory	Information
	Offshore or close to the coast (≤ 100 km inland)	6.5 – 7.0	Potential for a destructive regional tsunami	Watch	Watch	Advisory
		≥ 7.0	Potential for a destructive basin-wide tsunami	Watch	Watch	Watch
≥ 100	Offshore or inland (≤ 100 km)	≥ 5.5	No tsunami potential	Information	Information	Information

No message if the earthquake is localised inland beyond 100 km distance; no message if $M_w < 6.5$ and distance to the coast > 40 km; no message if $M_w < 5.5$.

Tsunami range	Mediterranean	NE Atlantic
Local	< 100 km	< 100 km
Regional	100 km to 400 km	100 km to 1000 km
Basin	> 400 km	> 1000 km

Example of tide-gauges operated by NOA

KORONI – tide gauge station

Radar sensor



**Data logger
& GPS**



KITHIRA – tide gauge station

**Radar & Pressure
sensors**

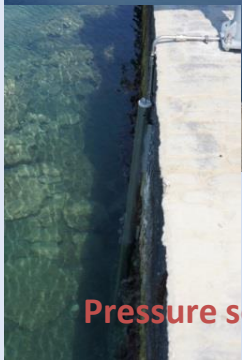


GPS



PALEOCHORA – tide gauge station

Pressure sensor



Radar sensor



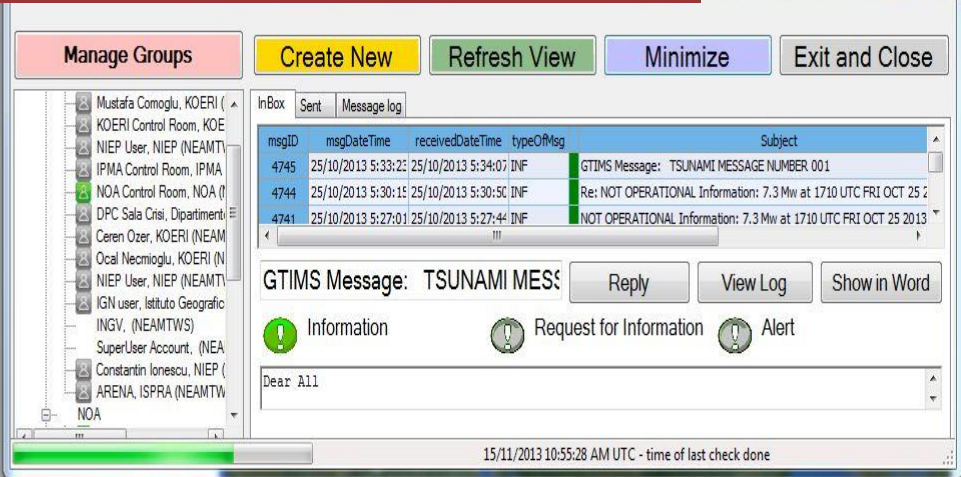
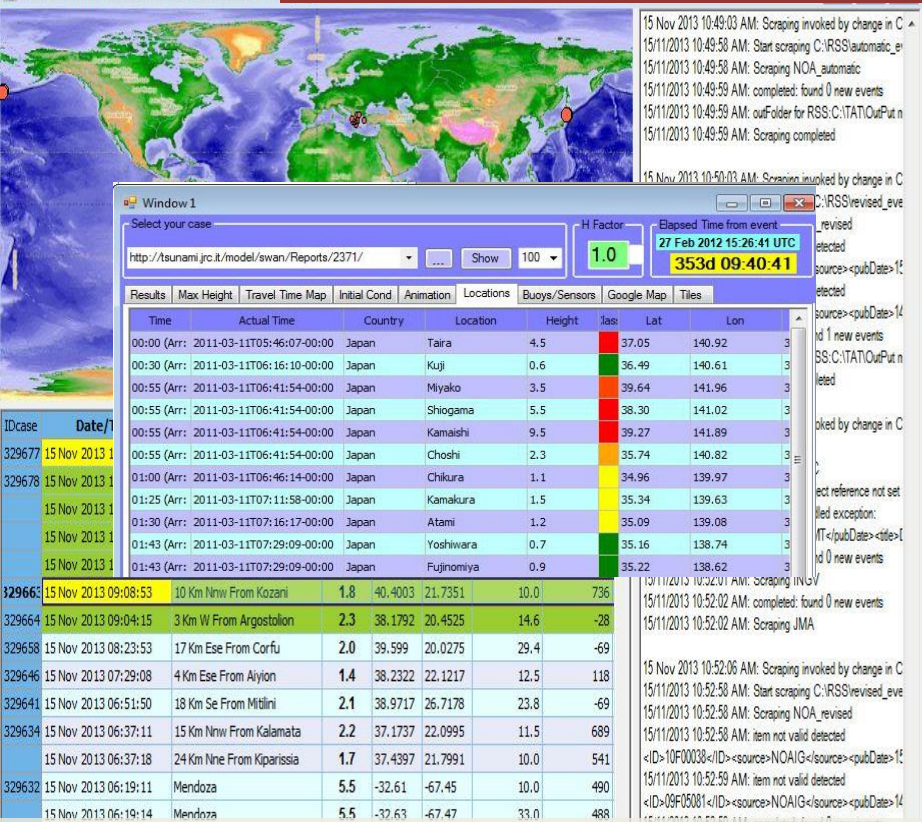
Pressure sensor



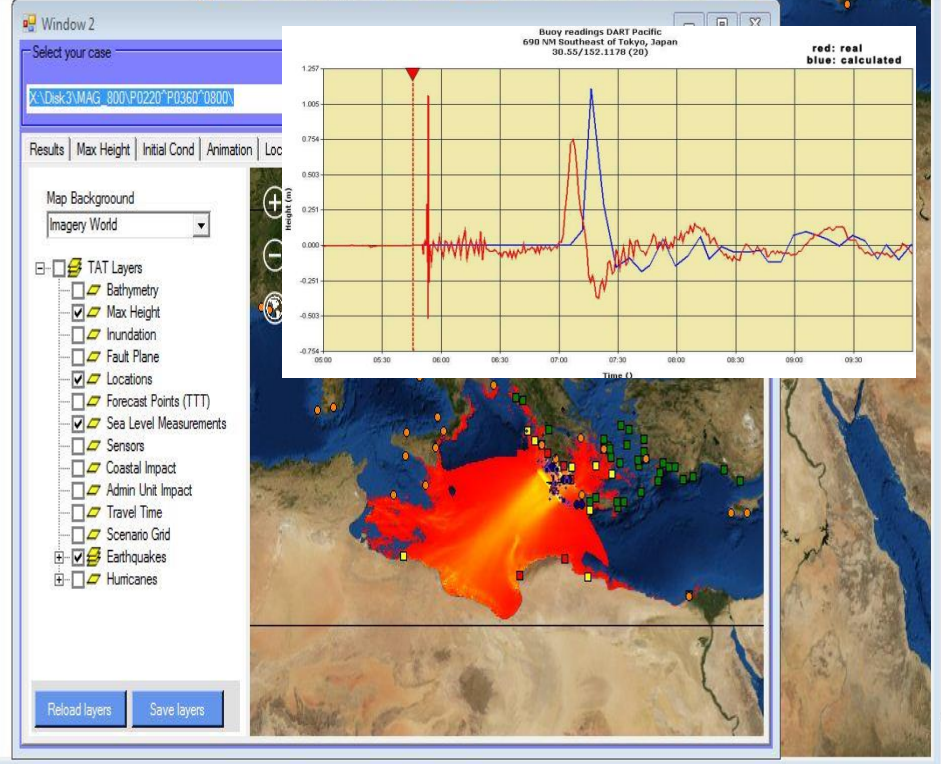
Data logger



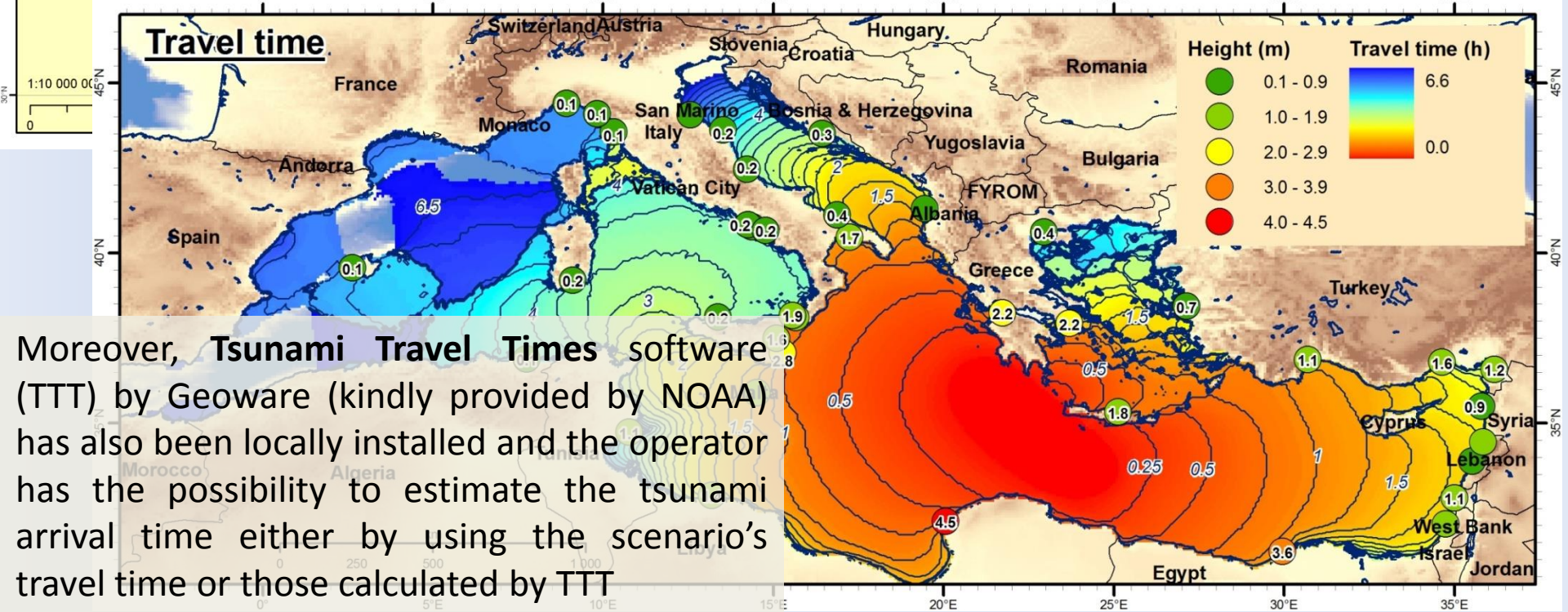
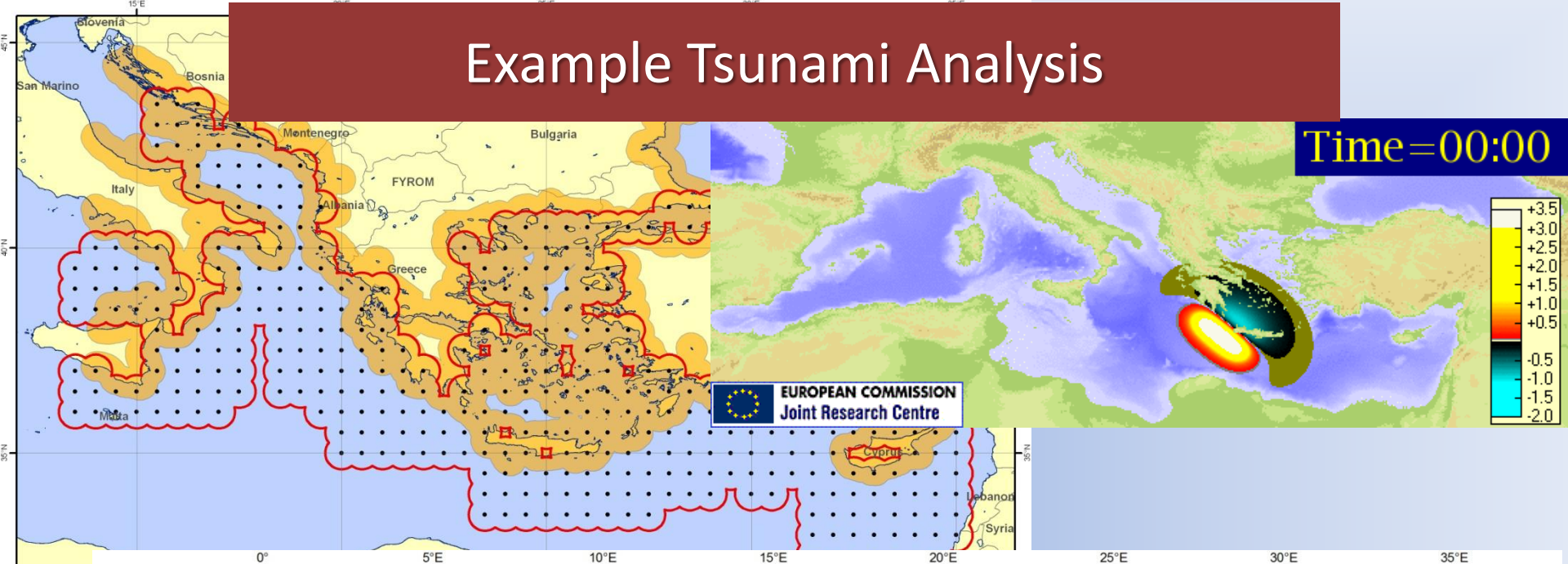
Example Tsunami Analysis



In the framework of cooperation with JRC, both MOD1 & 2 scenario databases have been fully installed and are already in use. The set of scenarios enables NOA-HLNTWC to estimate wave arrival times and wave heights near the coast. The processing and analysis of the scenarios has been implemented using the Tsunami Analysis Tool.

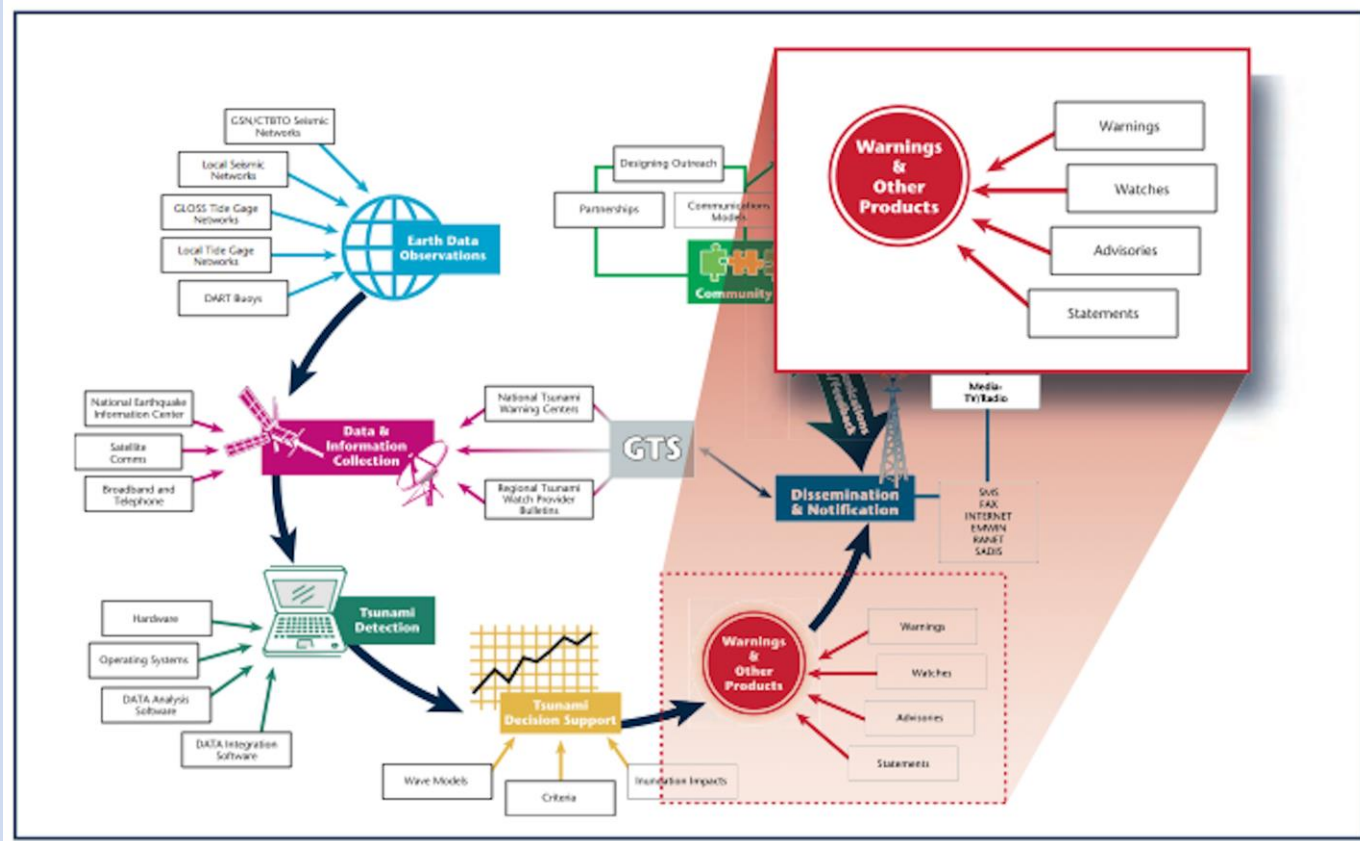


Example Tsunami Analysis



Moreover, **Tsunami Travel Times** software (TTT) by Geoware (kindly provided by NOAA) has also been locally installed and the operator has the possibility to estimate the tsunami arrival time either by using the scenario's travel time or those calculated by TTT

End-to-End Chain of Systems-of-Systems





End-to-End Chain starts with data collection and ends with saving lives.


(Figure from Tsunami Warning Reference Guide)

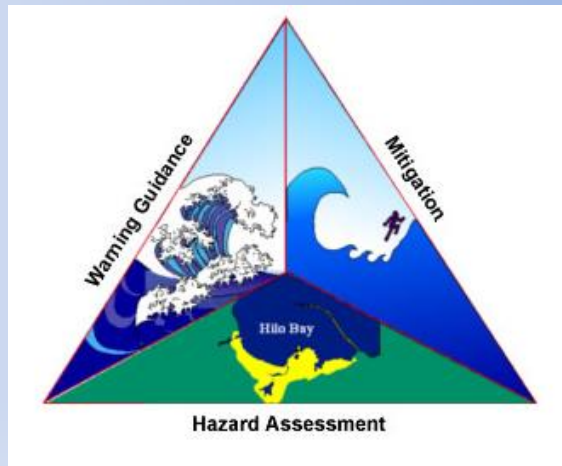
Right...

 ... information

 ... time

 ... place

 ... people



Message dissemination

WEME42 LTAA YYGGgg # GTS HEADER
TSUNAMI MESSAGE NUMBER [\$MN]
NEAM KOERI CANDIDATE TSUNAMI WATCH PROVIDER
ISSUED AT \$issuetimeZ \$issuedate

THIS ALERT APPLIES TO ALL COUNTRIES SUBSCRIBED TO THE SERVICES OF KOERI CTWP.

... TSUNAMI INFORMATION ...

THIS ALERT APPLIES TO [countries in the monitoring area where no tsunami is expected sorted in alphabetical order in the following format ...COUNTRY 1... ...COUNTRY 2...]

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 - \$origtimeZ, \$origdate
COORDINATES - \$lat NORTH \$lon EAST
DEPTH -4 depth KM
LOCATION - \$LocationName
MAGNITUDE - \$mag

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.

END OF TSUNAMI MESSAGE NUMBER [\$MN]

BOGAZICI UNIVERSITESI
KANDILLI RASATHANESI VE DEPREM ARASTIRMA ENSTITUSU
BOLGESEL TSUNAMI IZLEME VE DEGERLENDIRME MERKEZI - BTIM

... TSUNAMI BILGILENDIRMESI...

MESAJ GONDERI ZAMANI: \$issuedate_local \$issuetime_local

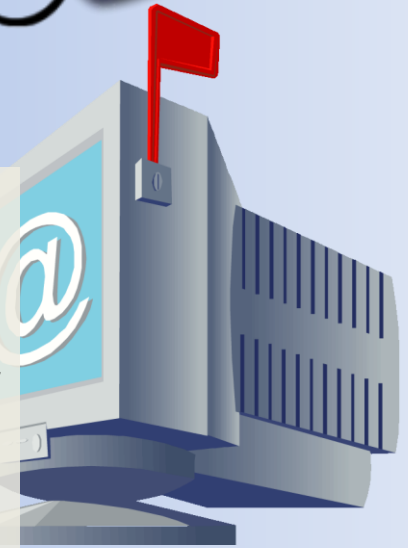
MERKEZIMIZ TARAFINDAN YAPILAN DEGERLENDIRMEDE ASAGIDA BILGILERI VERILEN DEPREMIN BIR TSUNAMIYE NEDEN OLMASININ BEKLENMEDIGI BELIRLENMISTIR:

OLUS ZAMANI: \$origtime_local \$origdate_local
MANYITUD: \$mag
YER: \$LocationName
KONUM: \$glat KUZHEY \$glon DOGU
DERINLIK: \$depth KM

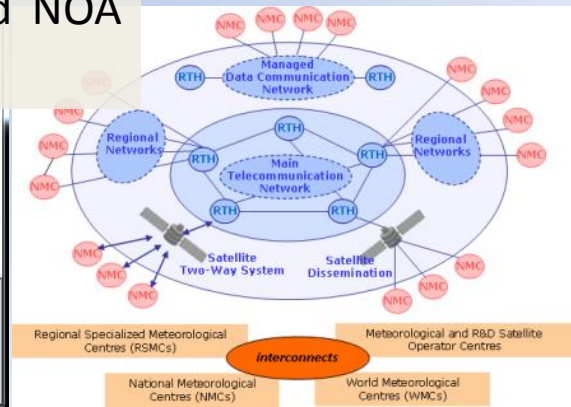
BU VE BENZERI DURUMLARDA BILIMSEL KAYNAGI BELIRSIZ, RESMI VE YETKILI KURUMLARCA YAPILMAYAN ACIKLAMA VE BILGILENDIRMELERIN DIKKATE ALINMAMASI ONEMLE RICA OLUNUR.



Message dissemination



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 NOAA HL-NTWC operating centers.



Inbox

File Edit View Go Message Tools Help

Get Mail Write Chat Address Book Tag

NTWC

Inbox Drafts Sent Trash

Local Folders

Trash Outbox

COM_TEST

COM_TEST_04_10_2012

COM_TEST_08_11_2012

COM_TEST_13_11_2012

COM_TEST_21_11_2012

NEAMWave12

OLD_MESSAGES

X-Alaska

X-Hawaii

X-Indian

X-Pacific

Quick Filter: ☆ ☆ ☆

Subject	From	Date
TSUNAMI COMMUNICATION ...	tsunami.dase@cenalt.cea.fr	05/12/2012 8:19 AM
WEMQ40 LFPW 050818	mss_oper@hnms.gr	05/12/2012 8:18 AM
[ctwp_tr] TSUNAMI COMMUNI...	twfp_tr@boun.edu.tr	04/12/2012 1:07 PM
WEME40 LTAA 041307	mss_oper@hnms.gr	04/12/2012 1:07 PM
tsunami alerts	elgabry@nriag.sci.eg	04/12/2012 9:28 AM
KOERI's Annex 2B for NOA scen...	twfp_tr@boun.edu.tr	29/11/2012 3:33 PM
NEAMWave12 confirmation BSH	Stephan Dick	29/11/2012 2:17 PM
communicatons test	Seifert Wolfgang	29/11/2012 2:14 PM
[twfp] TSUNAMI MESSAGE NU...	twfp_tr@boun.edu.tr	27/11/2012 12:34 PM

From mss_oper@hnms.gr

Subject WEMQ40 LFPW 050818

To hl_ntwc@noa.gr

069

WEMQ40 LFPW 050818

TSUNAMI COMMUNICATION TEST MESSAGE NUMBER 0001

NEAM CENALT CANDIDATE TSUNAMI WATCH PREVIOUS

ISSUED AT 0817Z 05 DE

Reply Forward Archive Junk Delete

05/12/2012 8:18 AM

Other Actions

No messages to download

ted1@194.177.194.085 - Yet Another Java HylaFAX Client (YajH)

Fax Table Server View Extras Help

Search:

Received	Sent	Transmitting
Time/Date	Sender	Error description
2012-12-09 08:15:38 AM	0225548020	
2012-12-06 01:04:10 PM	2103359981	
2012-12-06 12:59:39 PM	2103359981	
2012-12-05 08:21:44 AM	351 218402370	
2012-12-05 08:21:35 AM	351 218402370	
2012-12-05 08:19:52 AM	+33 169271874	
2012-11-28 03:01:20 PM	BOUN KOERI	
2012-11-28 01:03:18 PM	BOUN KOERI	00:00:37
2012-11-28 12:26:29 PM	BOUN KOERI	00:00:36
2012-11-28 12:11:59 PM	BOUN KOERI	00:01:08
2012-11-28 10:43:43 AM	+33 169271874	00:00:37
2012-11-28 09:57:00 AM	+33 169271874	00:01:27
2012-11-28 09:18:59 AM	+33 169271874	00:01:11

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

Message dissemination

FTP and Mail

Main | Settings | TAT | Timer

Mail Server	193.140.203.12	Remote Server	193.140.203.12
From	KDERI	Port Number	21
Send To	All	Mode	Passive
User Name	webadmin	User Name	webadmin
Password	webadminmy	Password	webadminmy
Subject	xxx	File to Send	FormGTS.txt

WEME40 LTAA 041242

TSUNAMI MESSAGE NUMBER 001

NEAM KOERI TSUNAMI WATCH PROVIDER

ISSUED AT 1242Z 04 JUL 2012

... TSUNAMI ADVISORY ...

AN EARTHQUAKE HAS OCCURRED WITH THESE PRELIMINARY PARAMETERS

ORIGIN TIME - 1238 UTC WED JUL 4 2012
 COORDINATES - 36.00 NORTH 28.00 EAST
 LOCATION -
 MAGNITUDE - 8

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.

EVALUATION OF TSUNAMI ADVISORY
 IT IS NOT KNOWN THAT A TSUNAMI WAS GENERATED. THIS WATCH 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.

ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS WITHIN THE WATCH AREA 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
R-DHOS - GREECE		36.4N 28.2E	04/07 12:38 UTC	1.5M/4.9F
SMI - GREECE		36.6N 27.8E	04/07 12:38 UTC	2.7M/8.9F
SMI - GREECE		36.6N 27.8E	04/07 12:38 UTC	2.7M/8.9F
DALAMAN - TURKEY		36.8N 28.8E	04/07 12:38 UTC	1.5M/4.9F
ORTACA - TURKEY		36.8N 28.8E	04/07 12:38 UTC	1.3M/4.3F
FETHIYE - TURKEY		36.6N 29.1E	04/07 12:38 UTC	1.0M/3.3F
KOS - GREECE		36.9N 27.3E	04/07 12:38 UTC	0.7M/2.3F
KUMLUCA - TURKEY		36.4N 30.3E	04/07 12:38 UTC	0.7M/2.3F
MOPRAL - GREECE		35.0N 24.9E	04/07 12:38 UTC	0.3M/1.0F
ANTALYA - TURKEY		36.9N 30.7E	04/07 12:38 UTC	0.4M/1.3F
MARMARIS - TURKEY		36.9N 28.3E	04/07 12:38 UTC	0.7M/2.3F

WEME40 LTAA 041242

TSUNAMI MESSAGE NUMBER 001

NEAM KOERI TSUNAMI WATCH PROVIDER

ISSUED AT 1242Z 04 JUL 2012

... TSUNAMI ADVISORY ...

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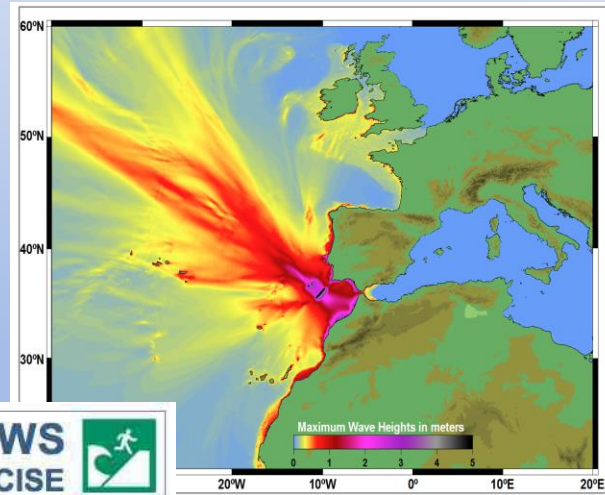
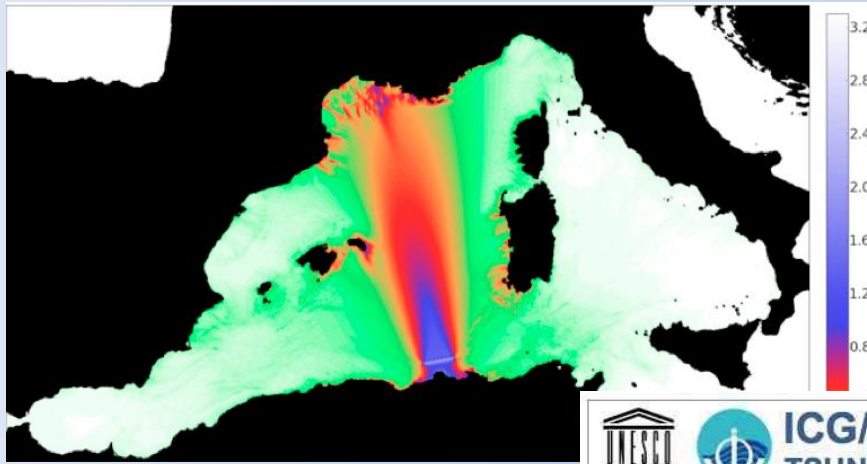
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ESTIMATED INITIAL TSUNAMI WAVE ARRIVAL TIMES AT FORECAST POINTS WITHIN THE WATCH AREA GIVEN BELOW. ACTUAL ARRIVAL TIMES MAY DIFFER AND THE INITIAL WAVE MAY NOT BE THE LARGEST. A TSUNAMI IS A SERIES OF WAVES AND THE TIME BETWEEN SUCCESSIVE WAVES CAN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

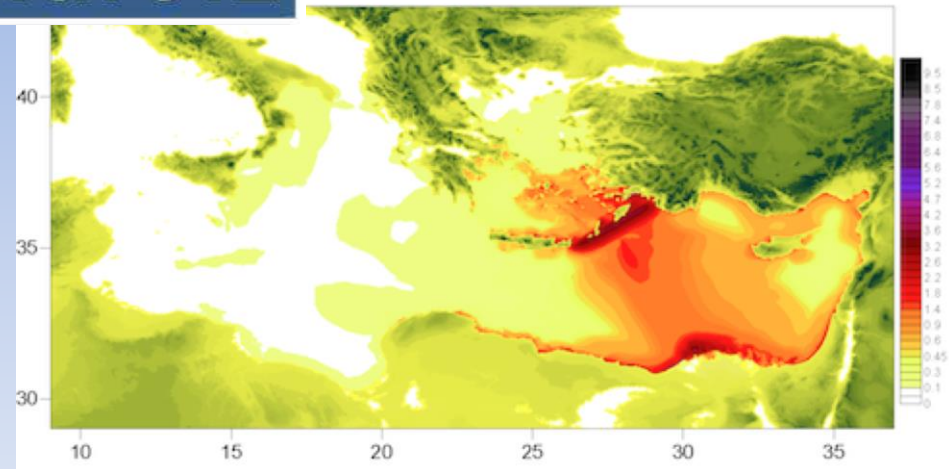
LOCATION	FORECAST POINT	COORDINATES	ARRIVAL TIME	LEVEL
R-DHOS - GREECE		36.4N 28.2E	04/07 12:38 UTC	1.5M/4.9F
SMI - GREECE		36.6N 27.8E	04/07 12:38 UTC	2.7M/8.9F
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MARMARIS - TURKEY		36.9N 28.3E	04/07 12:38 UTC	0.7M/2.3F

<input type="checkbox"/> EQ info	<input type="checkbox"/> GTS	<input type="checkbox"/> Auto	EQ watch:	SL Watch:
<input type="checkbox"/> TSW warning	<input type="checkbox"/> eMail		Old Date: 09.09.2012 07:37:45	?
<input type="checkbox"/> SL Cancel	<input type="checkbox"/> FAX	<input type="button" value="Send"/>	New Date: 09.09.2012 07:37:45	?
<input type="checkbox"/> SL TSW Warning			22	0
<input type="checkbox"/> TS end				


IOC coordinated Exercises




  **ICG/NEAMTWS**
TSUNAMI EXERCISE 
NEAMWave12



Rationale of CTEs

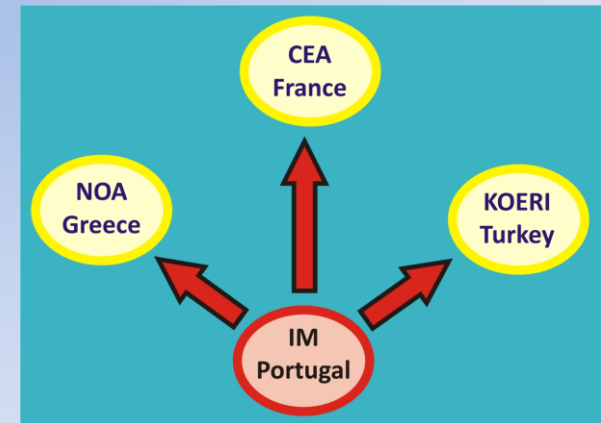
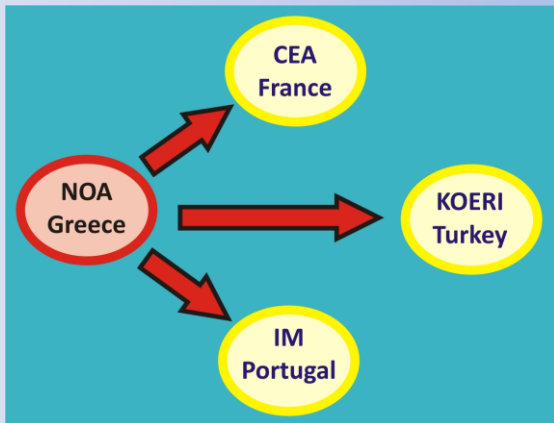
 The Candidate Tsunami Watch Providers (CTWP), National Tsunami Warning Centres (NTWC) and Tsunami Warning Focal Points (TWFP) must keep a high level of readiness so as to be able to act efficiently and effectively to provide watch (CTWP) and warnings (NTWC/TWFP) for the public's safety during fast-onset and rapidly-evolving natural disasters like the tsunamis.

 To maintain this high state of operational readiness, and especially for infrequent events such as tsunamis, tsunami watch/warning centres and emergency agencies must regularly practice their response procedures to ensure that vital communication links work seamlessly, and that agencies and response personnel know the roles that they will need to play during an actual event.

Initial CTEs


Initial CTEs were planned, conducted and evaluated by the a Task Team on Communication Test Exercises (TT-CTE) in June and September 2010.

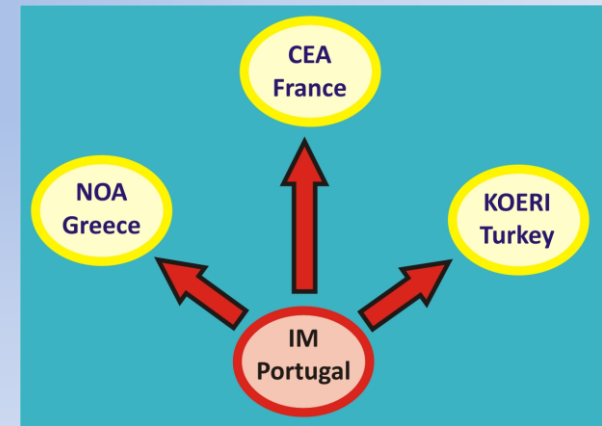
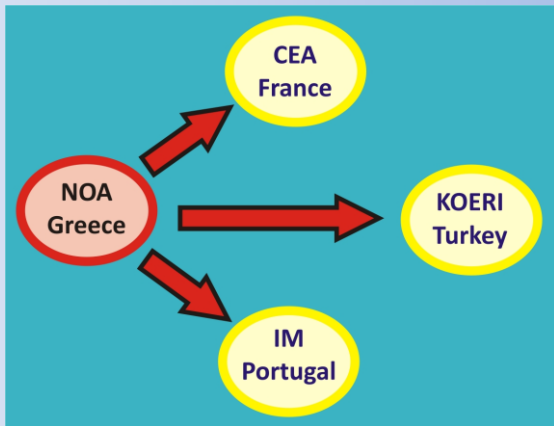
The scope of these exercises was limited to the Tsunami Watch Providers candidates at this time (Greece, France, Portugal and Turkey), in order to make a thorough evaluation on the procedures to broadcast and receive the tsunami messages.



Initial CTEs

 The communication links used were limited to e-mail and fax.

 Despite the small-scale and limitations, these two first Communication Test Exercises provided the required capacity building that opened the way to the first Enlarged Communication Test.




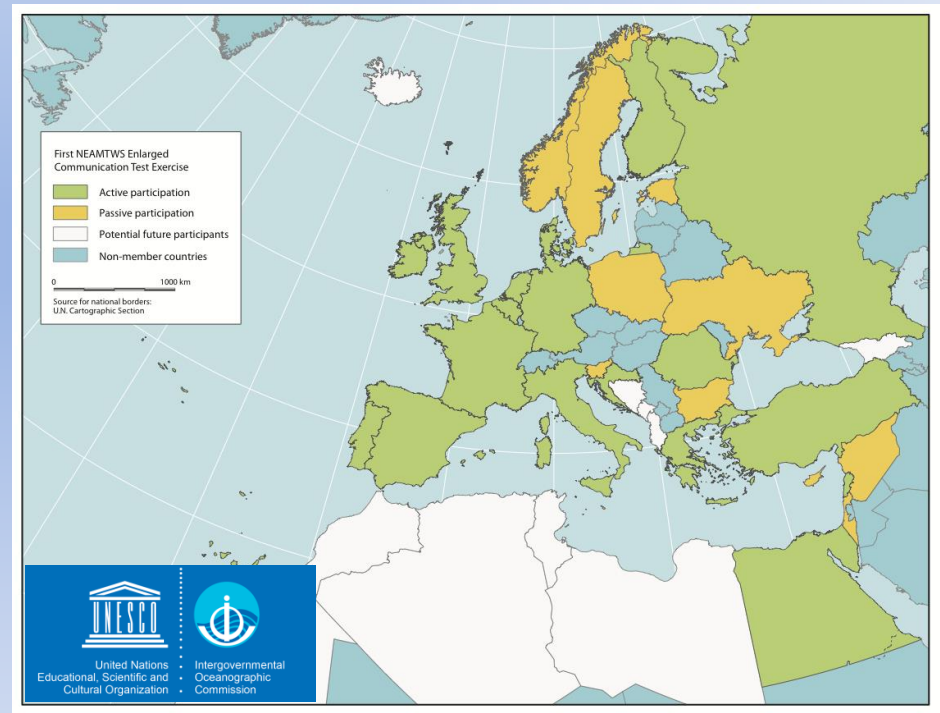
NEAMTWS-ECTE1

 The first Enlarged Communication Test Exercise was conducted on 10 August 2011.

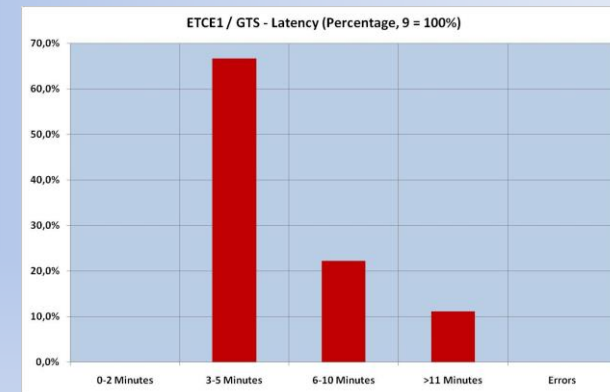
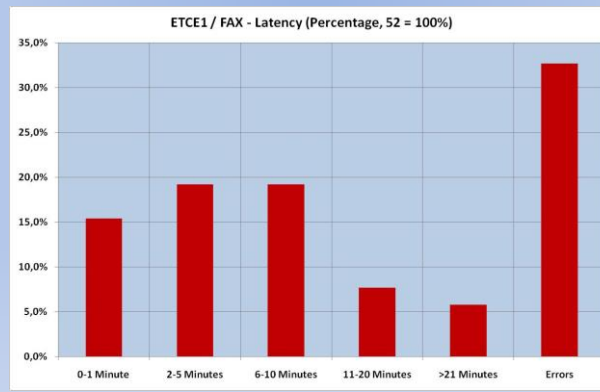
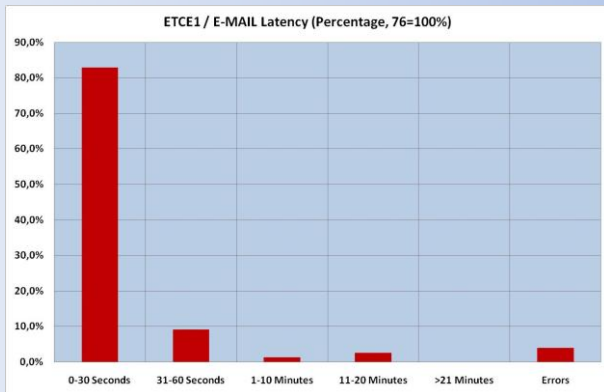
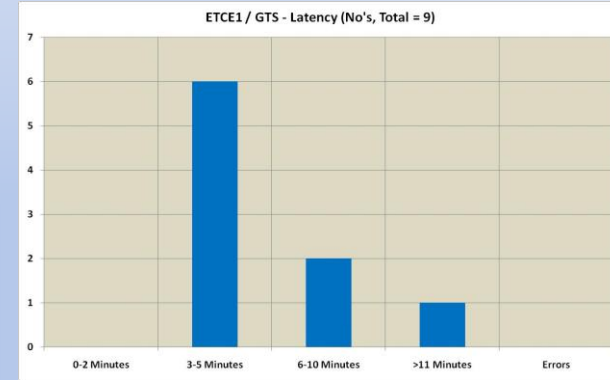
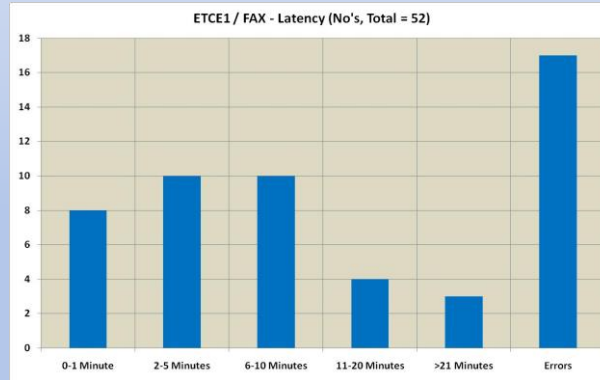
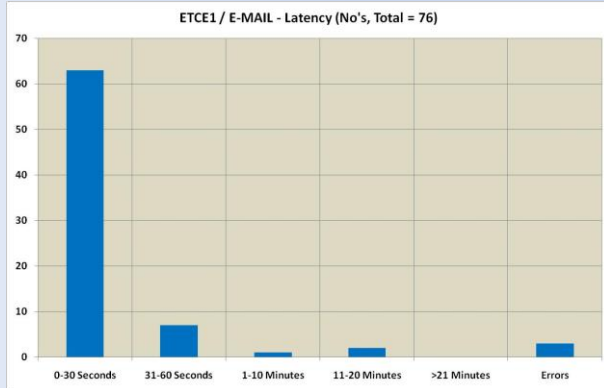
 Message Provider:
KOERI (Turkey)

 E-mail, fax and GTS


 ECTE1 was realized with the participation of 139 end-users, belonging to 42 agencies in 31 countries.



ECTE-1 Performance




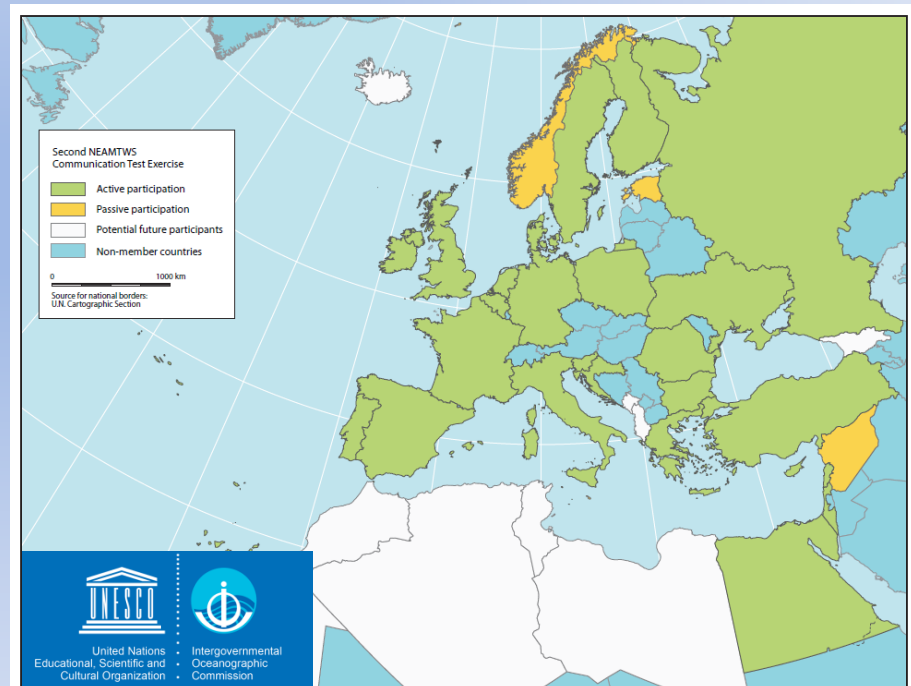
CTE2

 The second NEAMTWS Communication Test Exercise was conducted on 22 August 2012.

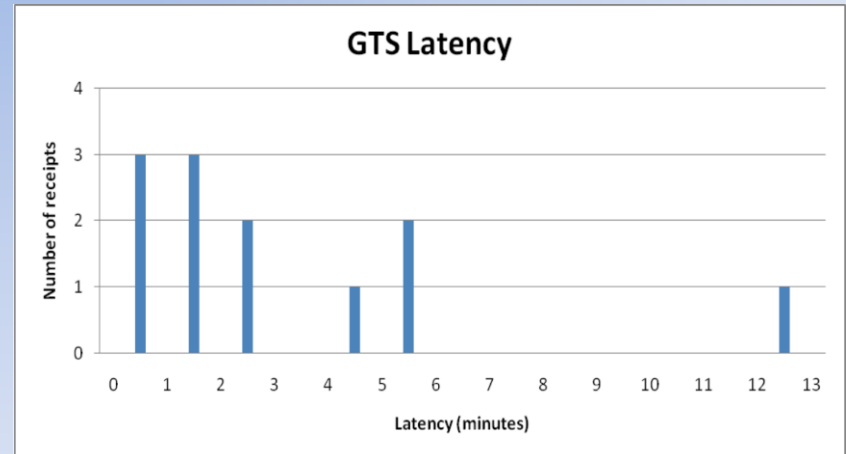
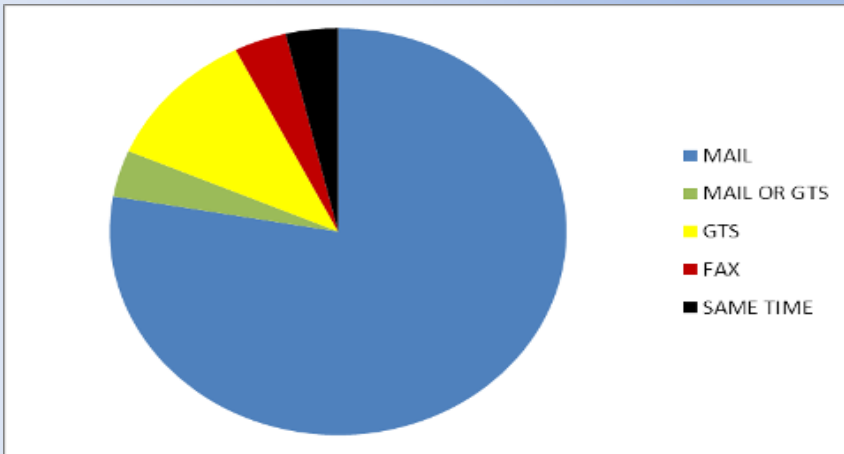
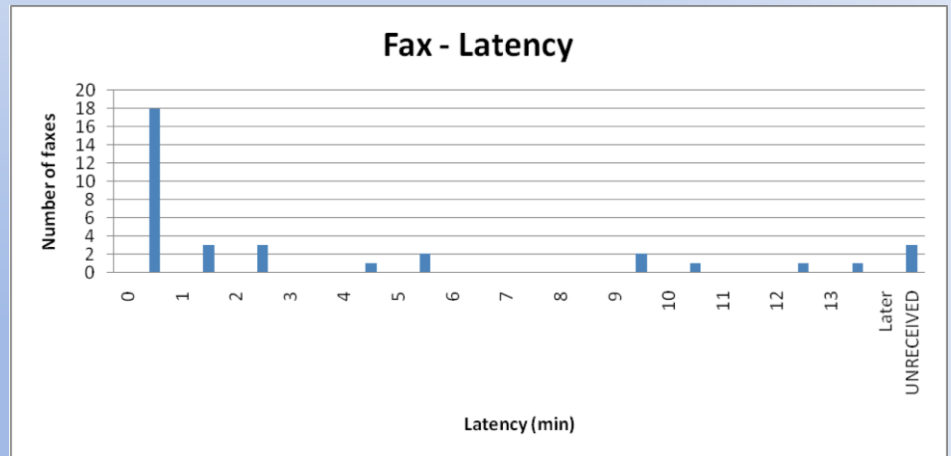
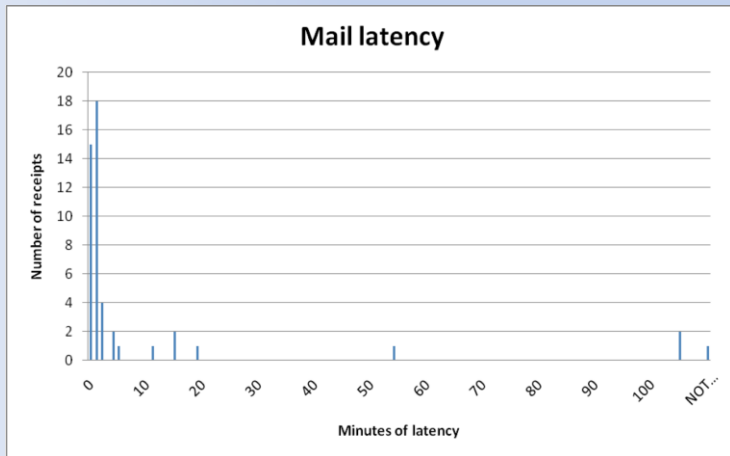
 Message Provider:
CENALT (France)

 E-mail, fax and GTS

 ECTE1 was realized with the Participation 31 countries.



CTE2



Updates

In the future, the conduct of the CTEs should be expected as the responsibility of CTWPs as a regular activity, where the TT-CTTE should perform an oversight role and should be responsible for the validation only.

of CTWPs \propto # of CTEs

Need to simplify and optimize the evaluation!



CTE Performance Indicators

The performance indicators are grouped into two major sets, one characterizes the universe of the exercise participants and the second one summarizing the technical details of the exercise results. The “CTE Performance Indicators” document is closely linked and cross-referenced to the CTE Manual and will be updated by the TT-CTTE co-chairs after each CTE.

CTE Performance Indicators

Table 4.2 Success of e-mail reception

Exer.	Addresses		Addresses		No		Success		Failures	
	available		reported		information					
CTE1	78		22	28%	56	72%	22	100%	0	0%
CTE2	62		48	77%	14	23%	47	98%	1	2%

Indicators on the Participants Univers

- e
- Registered TWFP and TNC
- Messages distribute
- Evaluation questionnaires received

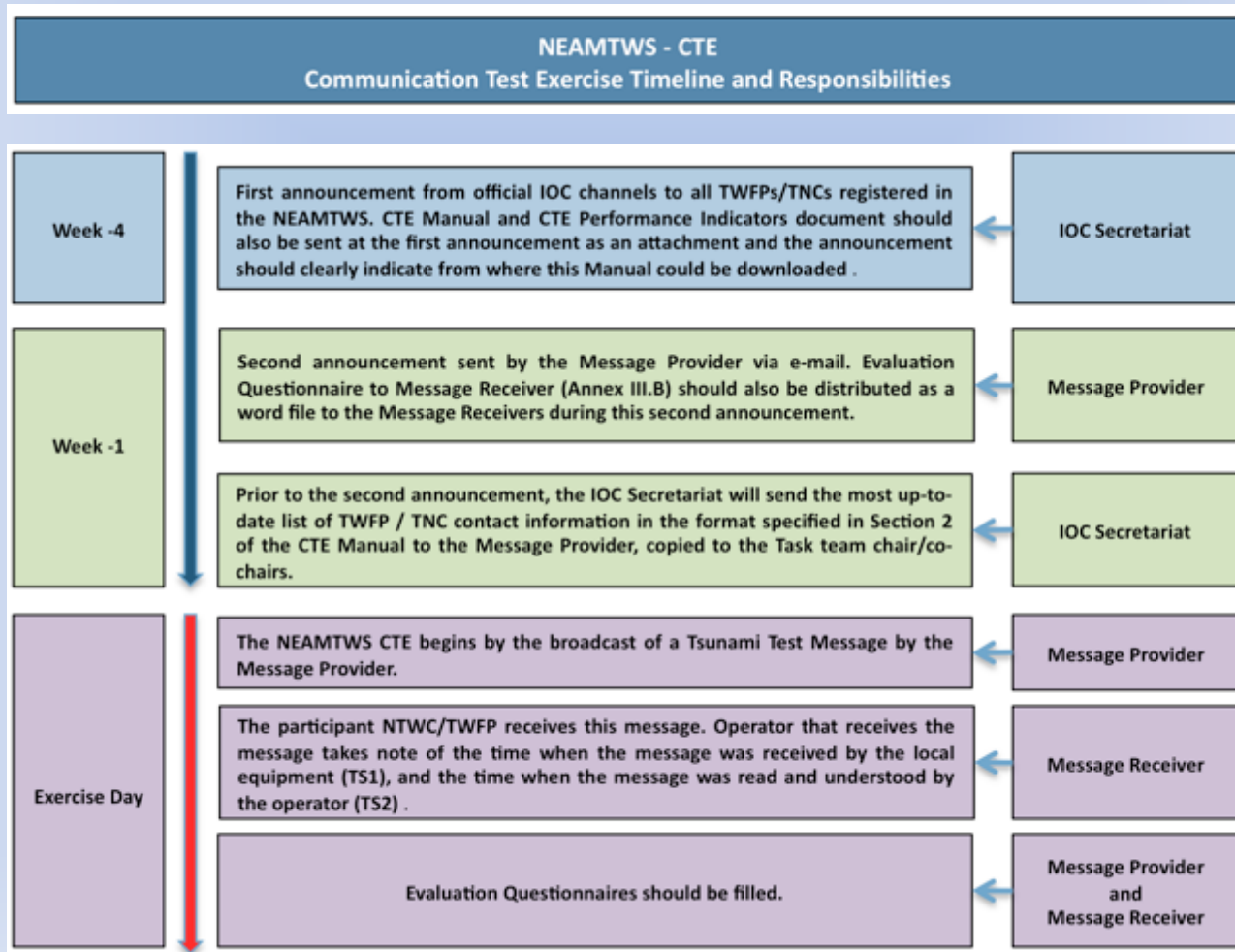
Indicators on the Exercise Preparation

- Synchronization of PCs
- Synchronization of Fax machines

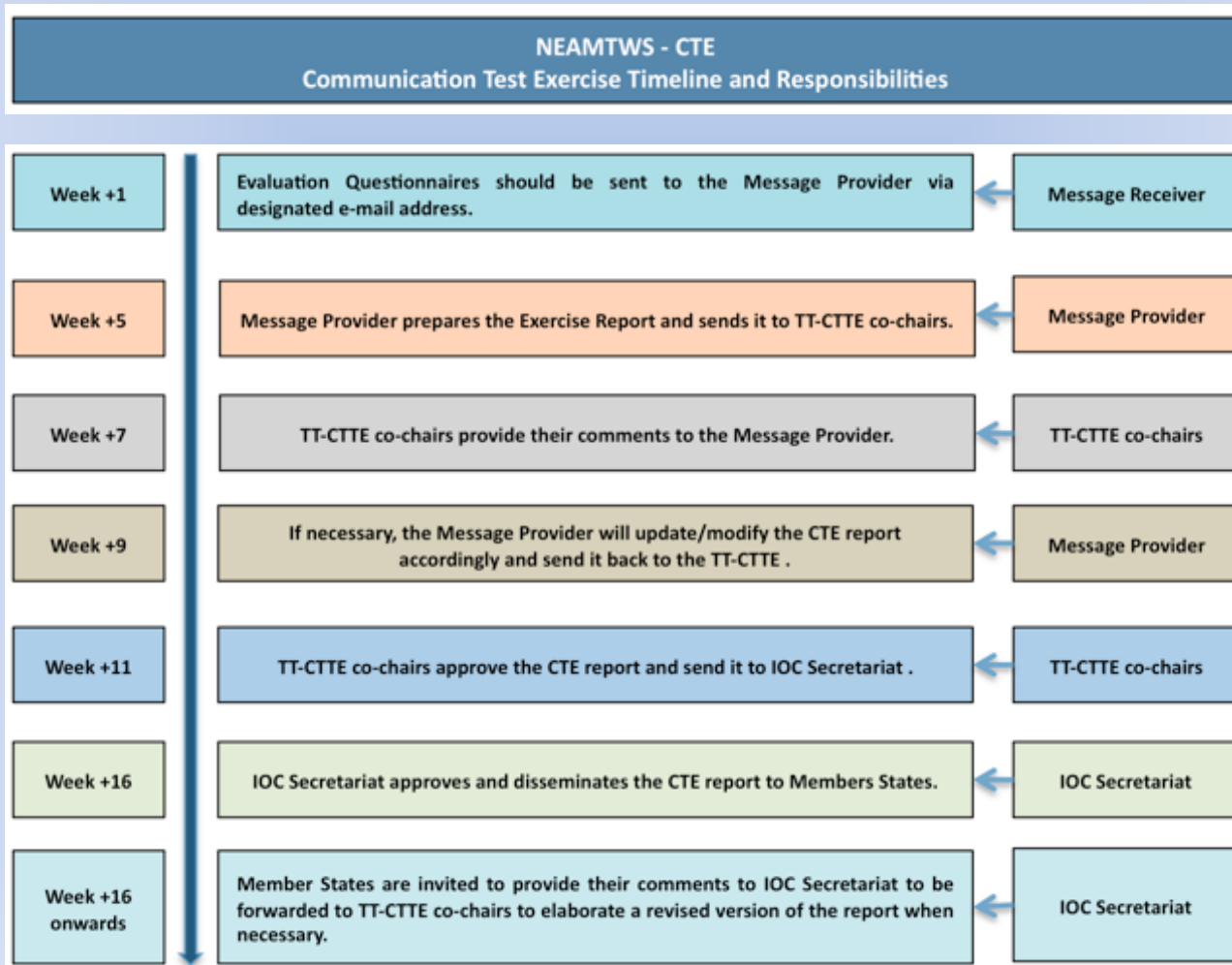
Indicators on Message Delivery

- Success of e-mail message delivery
- Success of e-mail reception
- Latency of e-mail messages
- Success of fax message delivery
- Delivery time of fax messages
- Fax transmission time
- Latency of fax messages
- Latency of fax messages measured from delivery time
- Latency of GTS messages.
- Latency of 1st message to be received by each country
- Type of the 1st message that was received by each county

CTE Manual: Timeline Flowchart



CTE Manual: Timeline Flowchart



CTE Manual Update: Checklist

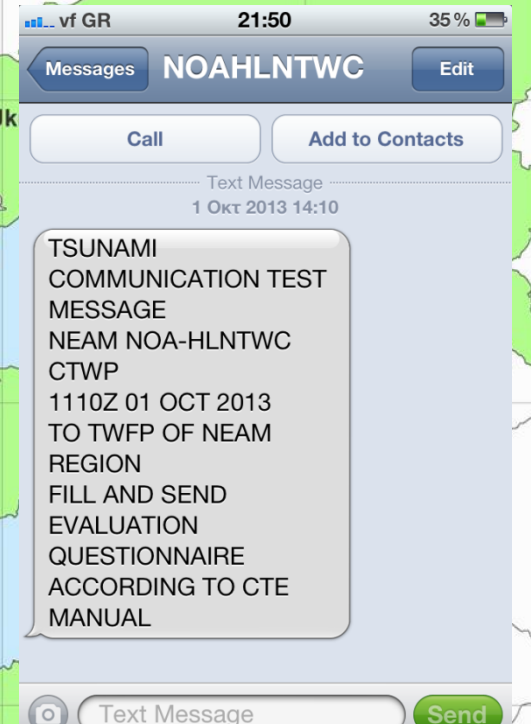
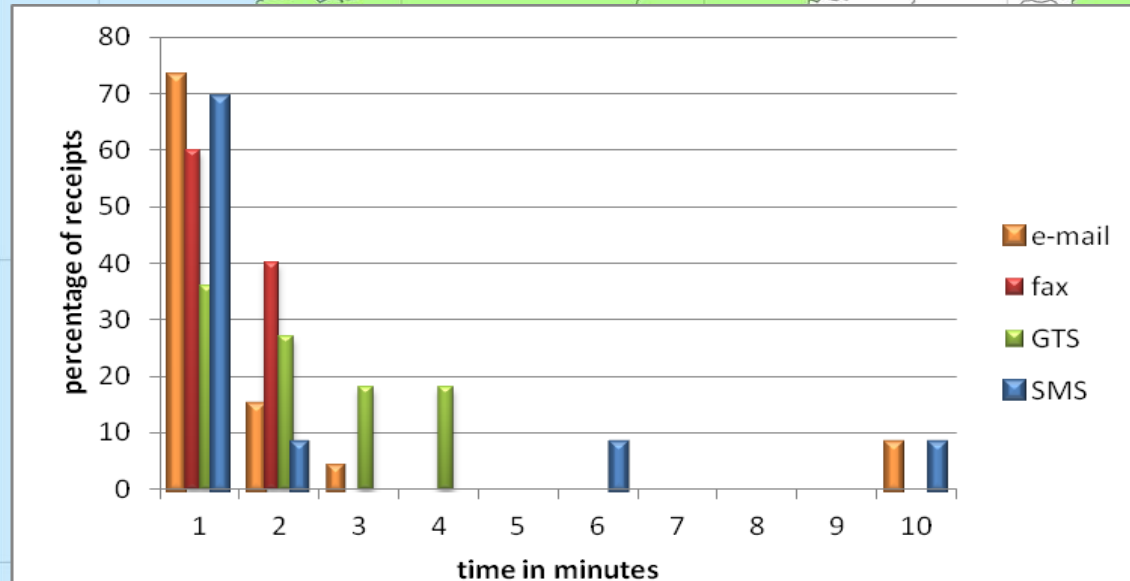
Time-line Week referred to Exercise Day	Action	Tick Boxes		
		MP	MR	IOC
-4	The CTE period begins by issuing a first announcement from official IOC channels to all TWFPs and TNCs registered in the NEAMTWS, at least 4 weeks in advance of the planned exercise date. This CTE Manual and CTE Performance Indicators Document should also be sent at the first announcement as an attachment and the announcement should clearly indicate from where this Manual could be downloaded.			
between -4 and -1	During the following 3 weeks period TWFPs from Member States (MS) will have the time to correct and/or update all the contact information. Updates are collected by the IOC Secretariat.			
between -4 and -1	During the following 3 weeks period the Message Provider defines the contacts that will be used to broadcast the Tsunami Test Message. This information is collected by the IOC Secretariat.			
-1 and 1/2 days	Prior the CTE second announcement, the IOC Secretariat will send the most up-to-date list of TWFP / TNC contact information in the agreed format (provided in the CTE Manual) to the Message Provider, copied to the Task team chair/co-chairs.			
-1	The CTE is preceded, one week before, by a second announcement sent by the Message Provider via e-mail in order to ensure that the anti-spam and firewall software operating in the Message Receivers networks do not block the Communication Test Exercise Message. Evaluation Questionnaire to Message Receiver (Annex III.B) should also be distributed as a word file to the Message Receivers during this second announcement.			
before 0	ASCII character set should be used in the message templates used in all communication technologies. All times in the evaluation questionnaires should be reported in HH:MM:SS UTC format.			
before 0	All communication technology systems should be synchronized.			
before 0	The number of e-mail message recipients would be restricted to 2 e-mail addresses per agency and 4 e-mail addresses per member state.			
before 0	The number of fax message recipients would be restricted to 2 per member state, thus 1 per agency if two agencies are designated. If a single agency has been designated, both primary and alternate fax numbers would be utilized.			
before 0	At least an 8-channel fax server for should be used for the fax message dissemination.			
before 0	The Message Provider should set up the fax server in such a way so that each recipient fax number will be subject to at least three attempts to send the fax message, where in each attempt the fax recipient will be ringed at.			
before 0	Message Recipients are recommended to develop codes to automatically detect fax messages and send them as internal email.			
before 0	Message Recipients are recommended to develop codes to automatically detect GTS messages and send them as internal email.			

0	The Message Provider broadcasts the Tsunami Test Message			
0	In addition to TS0, TS1E (time stamp of e-mail message) should be reported by the Message Provider			
0	In addition to TS0, TS1F (time stamp of fax message) should be reported by the Message Provider and ASCII character set should be used in the fax message templates.			
0	In addition to TS0, TS1G (time stamp of GTS message) should be reported and ASCII character set should be used in the GTS message templates.			
0	In coordination with the WMO-National Representatives, detailed GTS logs should be acquired both by the Message Provider and Message Recipient, where applicable.			
0	Operator that receives the message takes note of the time when the message was received by the local equipment (TS1), and the time when the message was read and understood by the operator (TS2).			
0	Evaluation Questionnaires should be filled on the day of CTE.			
1	Evaluation Questionnaires should be sent to the Message Provider via designated e-mail address.			

IOC coordinated Exercises

3rd Communication Test Exercise is conducted by **NOA** in October 2013, with the participation of 31 countries and 40 agencies.

4th Communication Test Exercise is conducted by **IPMA** on 30 June October 2014...



System-to-System Communication Example: TRIDEC

One major initiative leading towards the further improvement of the Tsunami Warning System was IPMA and KOERI's participation in the FP-7 Project TRIDEC focusing on new technologies for **real-time intelligent earth information management in collaborative, complex, critical decision processes involving large volume of data including sensor systems, geo-information repositories, simulation- and data-fusion-tools to be used in Tsunami Early Warning Systems.**

KOERI and IPMA's contribution to TRIDEC is mainly in the areas of end-user requirements, scenario definition and natural crisis management.

The key objective in TRIDEC is establishing a Decision Support System which can critically deliver timely information to decision makers during environmental crisis such as tsunamis or during the drilling process of an exploration well.

TRIDEC Natural Crises Management

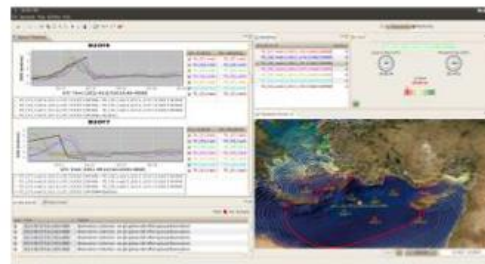
Command and Control User Interface

Monitoring
Perspective

Forecasting
Perspective

Message Composition
Perspective

Dissemination
Perspective



TRIDEC Natural Crises Management

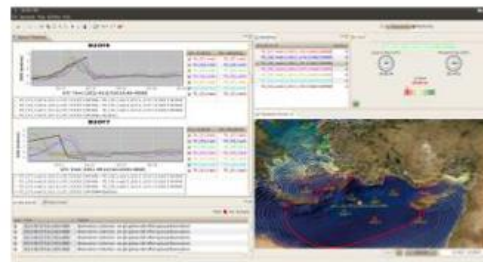
Command and Control User Interface

Monitoring
Perspective

Forecasting
Perspective

Message Composition
Perspective

Dissemination
Perspective



TRIDEC Natural Crises Management

Message Composition Perspective

CCUI: TR

File Navigate Map Window Help

Message Forecasting Monitoring

Detail View Map Elements

Kusadasi

General

Name/ID: Kusadasi

ETA: 2011-09-21T16:32:00+0000

Hazard: **SSH: 4.61**

CAP Criticality

CAP Severity: Extreme

*Situation Picture

Affected Areas

Label	minETA (UTC)	Hazard	MsgRefs
Erzin	2011-09-21T16:38:00+0000	SSH: 2.45	0
Ceyhan	2011-09-21T16:37:00+0000	SSH: 1.83	0
Dörtöl	2011-09-21T16:36:00+0000	SSH: 1.52	0
Selçuk	2011-09-21T16:35:00+0000	SSH: 0.85	0
Menderes	2011-09-21T16:34:00+0000	SSH: 0.90	0
Kusadasi	2011-09-21T16:32:00+0000	SSH: 4.61	1
Seferhisar	2011-09-21T16:32:00+0000	SSH: 0.84	0
Çesme	2011-09-21T16:32:00+0000	SSH: 1.21	0
Söke	2011-09-21T16:32:00+0000	SSH: 4.01	0
Urla	2011-09-21T16:31:00+0000	SSH: 0.94	0

Snapshots SDI: Territories

Thumbnail	ID	Name
	1	Tsunami

Disseminated Messages

Label	Timestamp	CAA processing
inre:NC:TR_CAP1	2011-09-21T16:16:	

Message Generation

Message Form Valid message form ... for dissemination.

Start Message Dissemination

Message Type

TsunamiWarning

Affected areas

Kusadasi

Criticality

Urgency: Expected

Severity: **Extreme**

Certainty: Observed

Message details

Category: Safety Geo

Status: Actual

Tech.msg.type: Alert

Response type: Shelter

Onset: Use Use as MinTimeOfArrival

2011-09-21T16:14:23+0000

Additional Parameters

Key	Value
TimeOfArrival	2011-09-21T16:14:23+0000

Snapshots

Message References

1:5,42 WGS 84 33.0669, 39.6847

TRIDEC Natural Crises Management

Dissemination Perspective

CCUI: TR
File Navigate Map Window Help

Message ... Message ... Forecasting Monitoring

*Situation Picture

EMAIL Channel SMS Channel

EMAIL Channel

Channel Statistics:

Disseminated Messages:

ILC Message ID	Dissemination Time	Explicit Address	Status	Channel Provider Name
um-org:fossilab:centre:NC:TR_CAP2	2011-09-21T16:17:01+0000		ERROR_RETRYING_DELIVER	9
um-org:fossilab:centre:NC:TR_CAP3	2011-09-21T16:17:54+0000		SUCCESS_DELIVERY_TO_ME	19
	2011-09-21T16:17:54+0000		SUCCESS_CHANNEL_PROVIDE	19
	2011-09-21T16:17:11+0000		ERROR_RETRYING_DELIVER	9
	2011-09-21T16:17:45+0000		SUCCESS_DELIVERY_TO_ME	19
	2011-09-21T16:17:45+0000		SUCCESS_CHANNEL_PROVIDE	19

Detail View

Dissemination Status Message

General Information:

Identifier: um-org:fossilab:centre:NC:TR_CAP3_IDC5
 Reference: um-org:fossilab:centre:NC:TR_CAP3
 Incident: um-org:fossilab:centre:NC:TR:?
 Status Code: SUCCESS_DELIVERY_TO_MESSAGE_CONSUMER
 ADDRESS SUCCEEDED:
 Address: [REDACTED]
 Description: Command: RCPT TO: <[REDACTED]> NOTIFY=SUCCESS,FAILURE,DELAY
 RetCode: 250 [REDACTED]
 Response: 250 [REDACTED] accepting mail from a client address
 Dissemination Time: 2011-09-21T16:17:54+0000

1:5,40 WGS 84 27.9402, 29.4792

Use of TRIDEC in NEAMWave12

EC – 7th Framework Programme

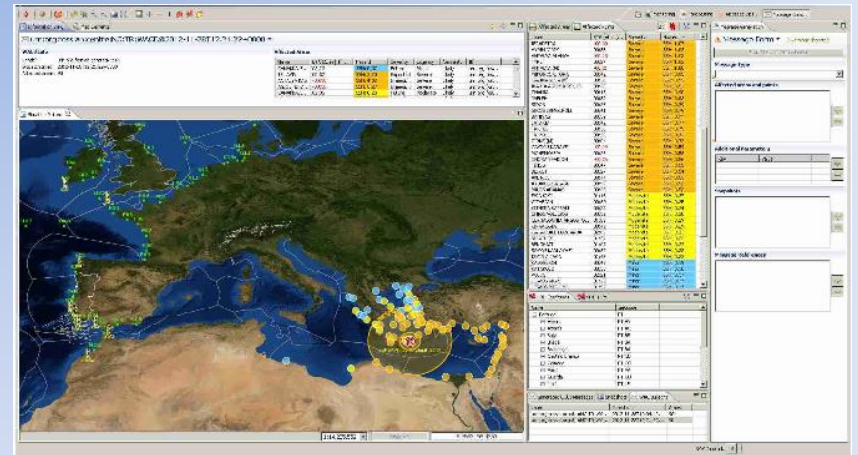
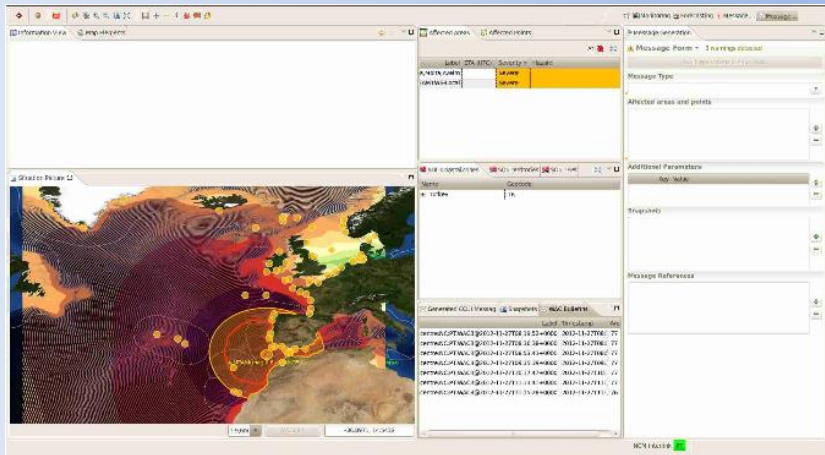
TRIDEC

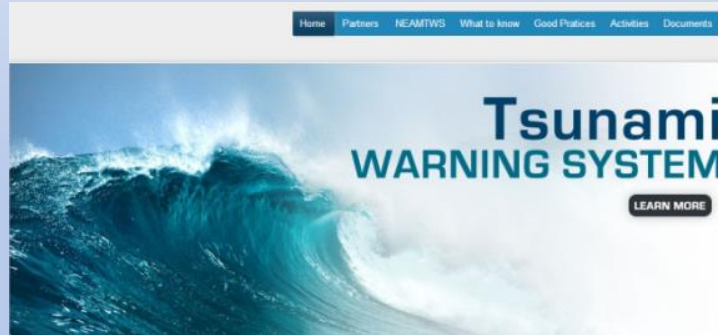
**Collaborative, Complex and Critical Decision-Support
in Evolving Crises**

TRIDEC is an Integrated Project focusing on new approaches and technologies for intelligent geo-information management in collaborative, complex and critical decision processes in earth management.

TRIDEC was used by IPMA as the Main System during the NEAMWave12. At KOERI, TRIDEC was exploited on top of the Operational System making use of additional functionalities such as Crowd-mapping Platform Ushahidi (crisis-mapping platform), Wide Area Centre-to-Centre Communication (WAC), Eyewitness Reports via Android App Geohazard.

TRIDEC @ NEAMWave12





thank you ...