MONGOOS NETWORK

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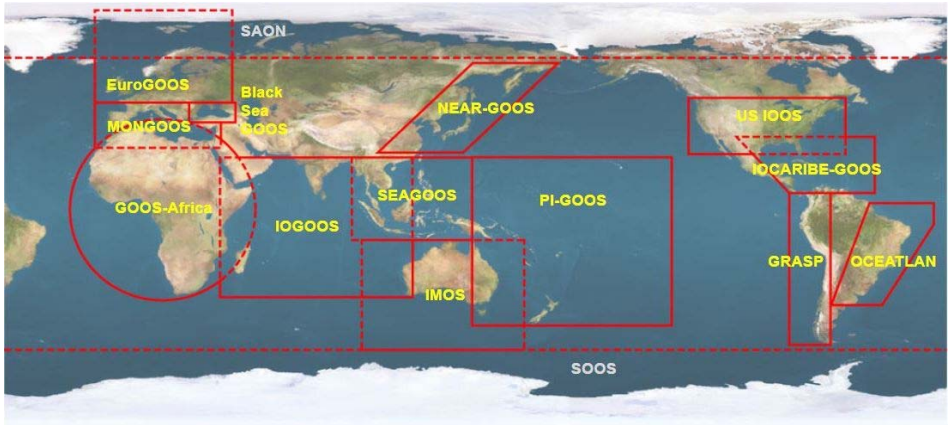
Giovanni Coppini *(CMCC)*
MonGOOS partners

What is Mongoos?

(*Mediterranean Operational Network for the Global Ocean Observing System*)

- GOOS regional alliance for Operational Oceanography at the Med Sea.
- Established in 2012
- MONGOOS comprises the previous activities of MOON and MEDGOOS (co-leaded by Kostas)
- Objective of fostering operational oceanography in the Med Sea and promote collaboration with EuroGOOS and AfricaGOOS



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General Objectives (from the MoA)

- (a) Continuously advance the scientific understanding and technological systems upon which the operational oceanographic Services are based
- (b) Promote the visibility and recognition of the Services with governmental agencies and private companies, encourage their exploitation and integration at national, regional, European and global levels.
- (c) Enhance the usability of the Services and their usefulness for policy implementation, societal needs, blue jobs and science.
- (d) Support the planning and implementation of international initiatives involving operational oceanography and promote the participation of non-EU Mediterranean countries

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Partners:

- 34 partners (2 new members, ISPRA and Croatia Met office)
- Mainly from Europe
- No subscription cost associated
- Benefits of participation:
  - Consortiums for projects
  - Interchange of information, data and best practices
  - Increase of visibility
  - Participation in a common multicultural effort

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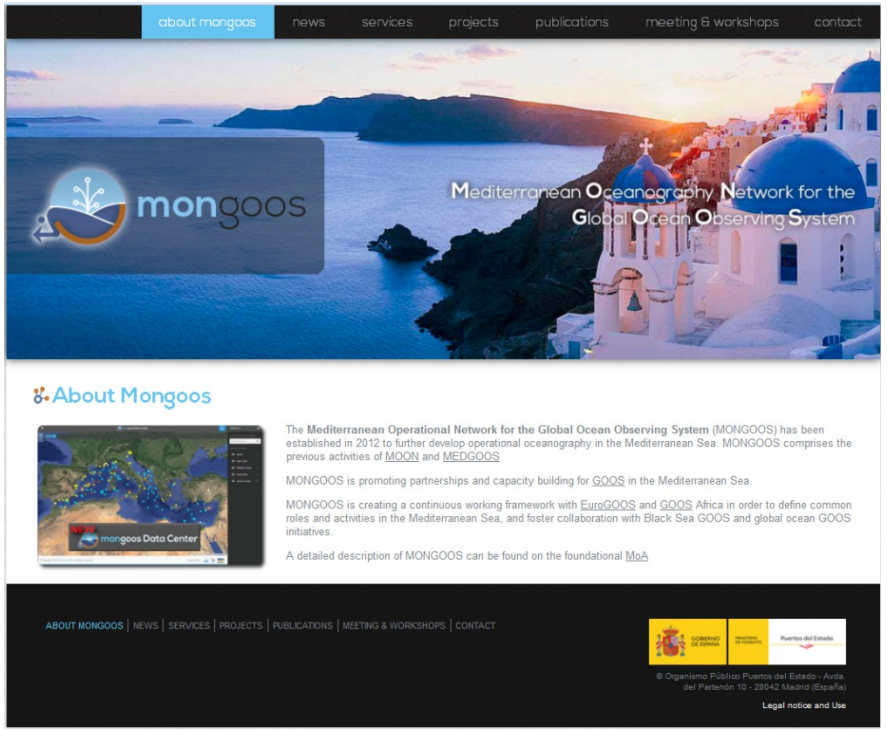
Operational Oceanography in the Mediterranean Sea as reflected in the MonGOOS web page

- Two main tools:
- The Show case tool:
  - Access to capacities of each institution
  - Distributed approach
- The MonGOOS data center:
  - Access to real time data
  - Centralized approach

www.mongoos.eu



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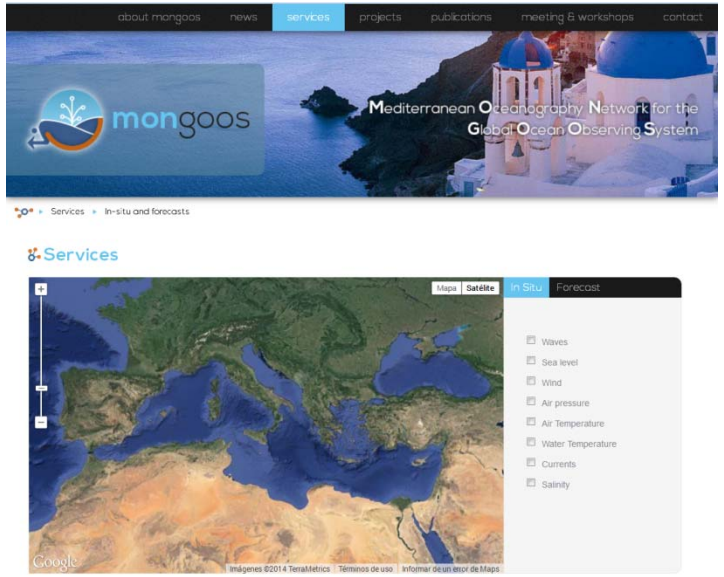
The MonGOOS showcase tool

- Based on a new tool serving as a **showcase** of partners capabilities. At this stage:
  - Models
  - Stations
  - Satellite data
- Tool public on MonGOOS web page



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Modeling activities

- Reasonable situation in the Mediterranean area.
- Existing models for waves, sea level, circulation, etc.
- For circulation, clear “butterfly” approach: from Copernicus to nested models

- Major limitation is, as in other seas, data to assimilate into circulation models. Mesoscale patterns not always on the “right position”
- Limited areas with really high resolution operational downscalling
- Issue on sustainability: national systems based on project funding, limited money for R&D
- Poor R&D funding and ssustainability on downstream service (oil spill, SAR, storm surge…)

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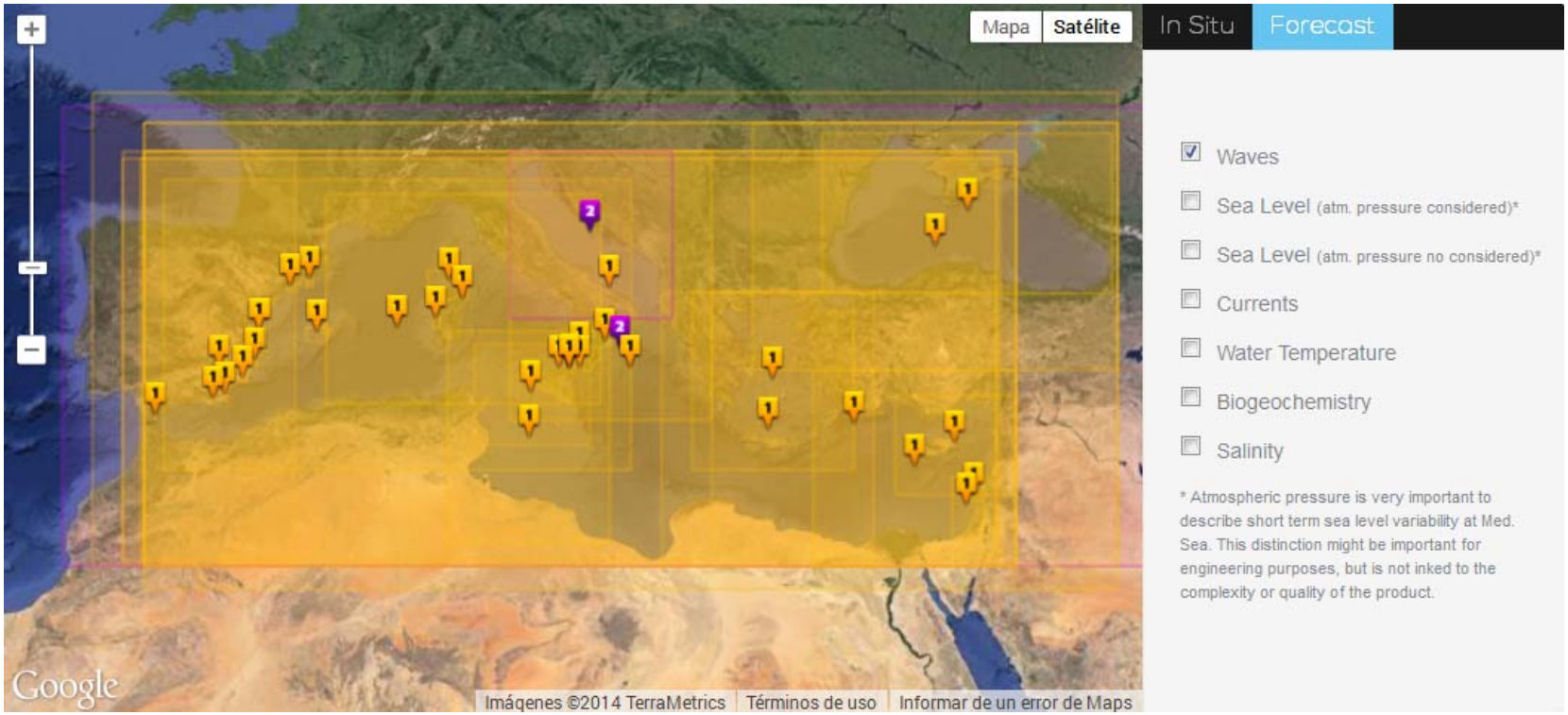
Wave Forecast systems



- Several global systems and many nested applications

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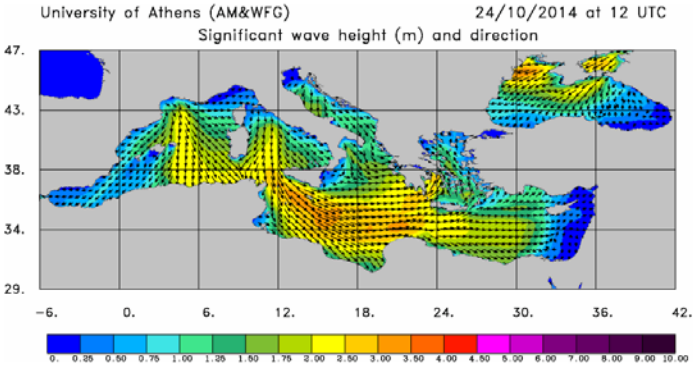
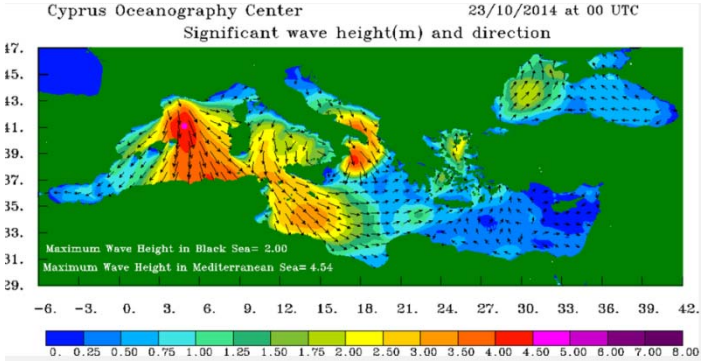
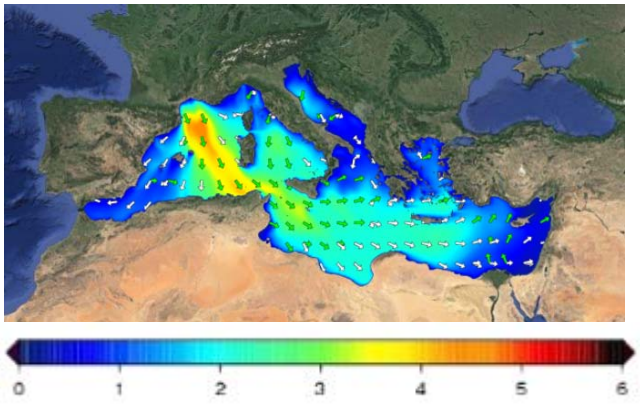
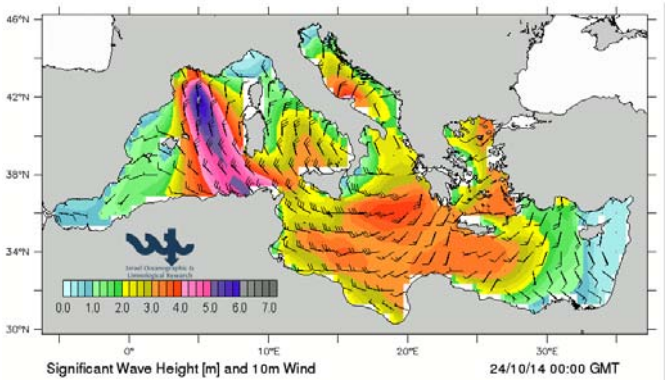
Wave Forecast systems









- Some examples

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The Med Sea forecast copernicus

- Copernicus system
- Data assimilation
- Many systems nested here (butterfly approach)

European Commission

COPERNICUS
MARINE ENVIRONMENT MONITORING SERVICE
Providing PRODUCTS and SERVICES for all marine applications

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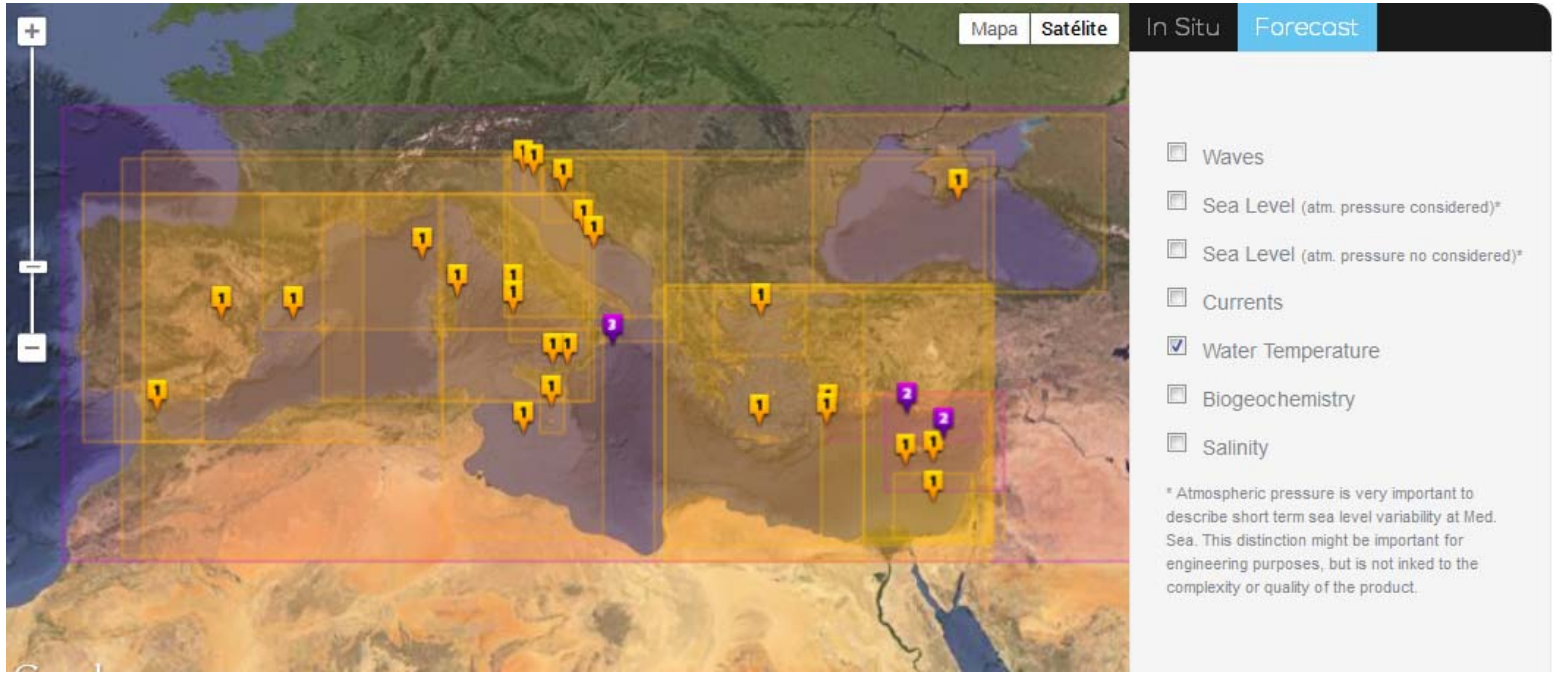
Circulation forecast systems

- Most of the systems nested into MyOcean



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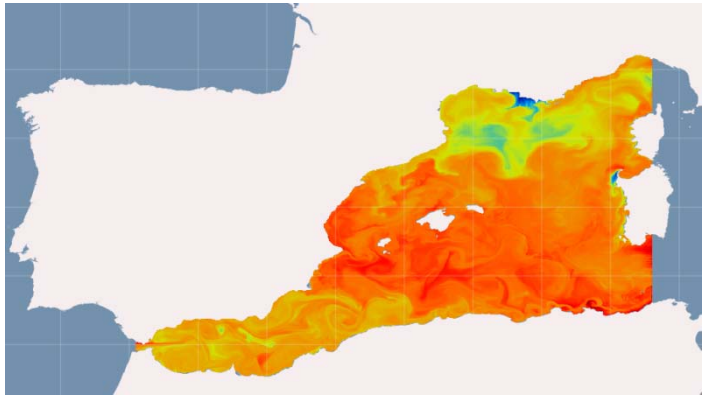
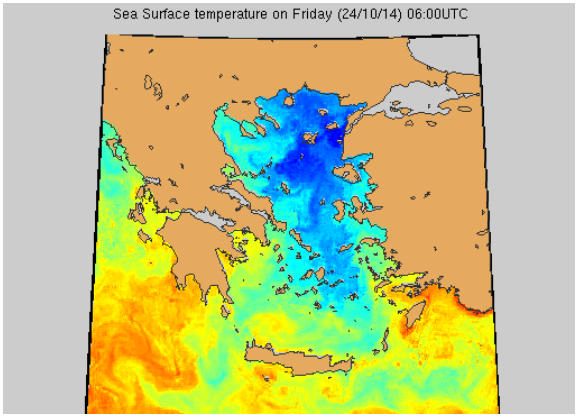
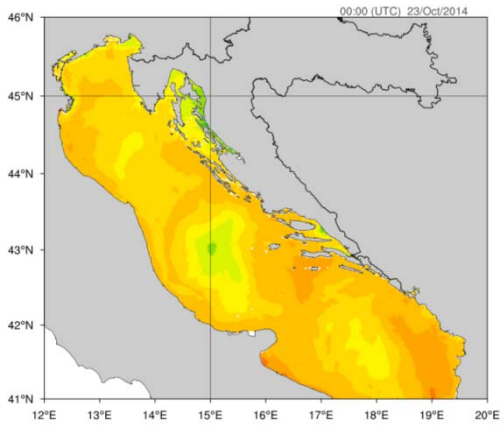
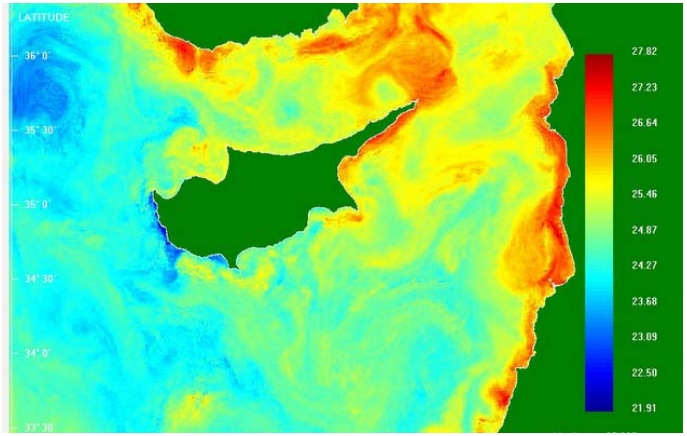
Nested circulation forecast









- Some examples

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MonGOOS and in-situ data

- Role of MonGOOS:
  - Act as a focal point of regional activities, promoting the improvement of existing systems and the development of new ones (special focus in Northern Africa)
  - Promote the development of a Mediterranean data center associated with MonGOOS
  - Collaborate with EU level institutions (EuroGOOS) and projects (EMODNET Physics), services (Copernicus in-situ), institutions (e.g. UNEP-MAP and EEA)

- Situation
  - Strong (dramatic) imbalance North-South
  - Unequal distribution as a result of a lack of global planning
  - Difficulties for data interchange (not the major problem)
  - Missing a long term funding for sustainability and R&D

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Sources available on MonGOOS web page

- Links to data and institutions
- No station in Africa
- Still many existing stations missing…

- Waves: 51
- Sea level: 100
- Wind: 78
- Air Pressure: 81
- Air Temperature:80
- Water Temperature: 113
- Currents: 37
- Salinity: 50

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Sea level stations

- No station in Africa
- Still many existing stations missing…

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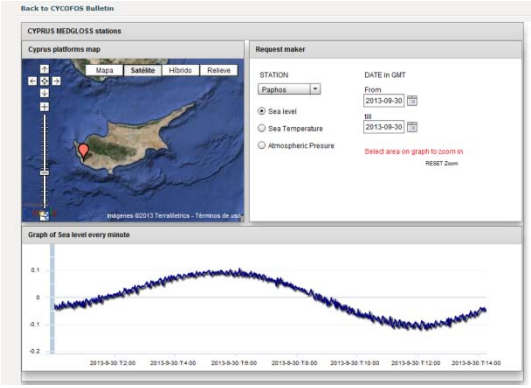
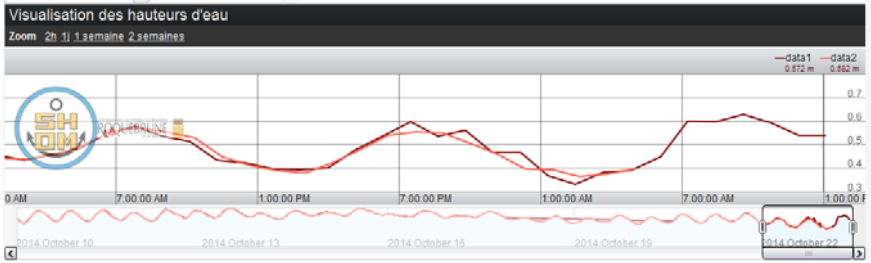
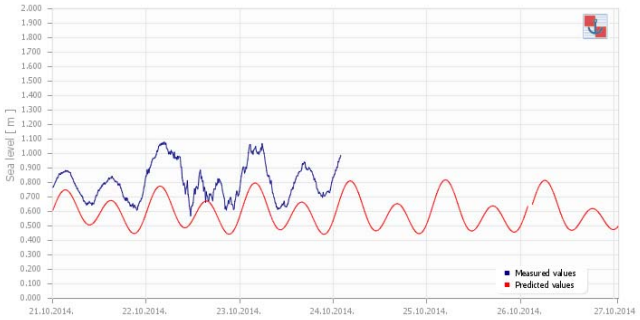
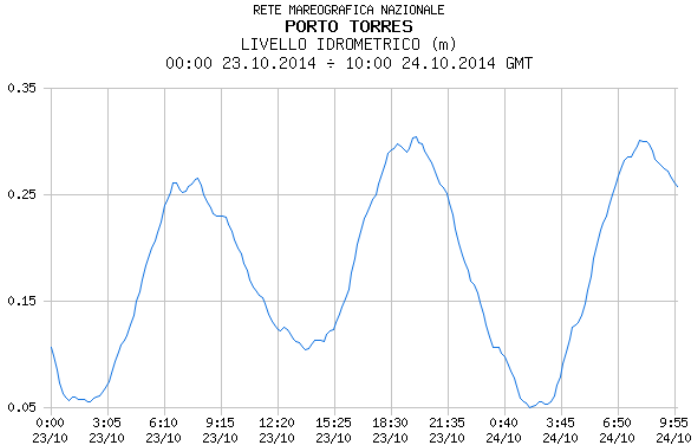
Real time sea level measurements



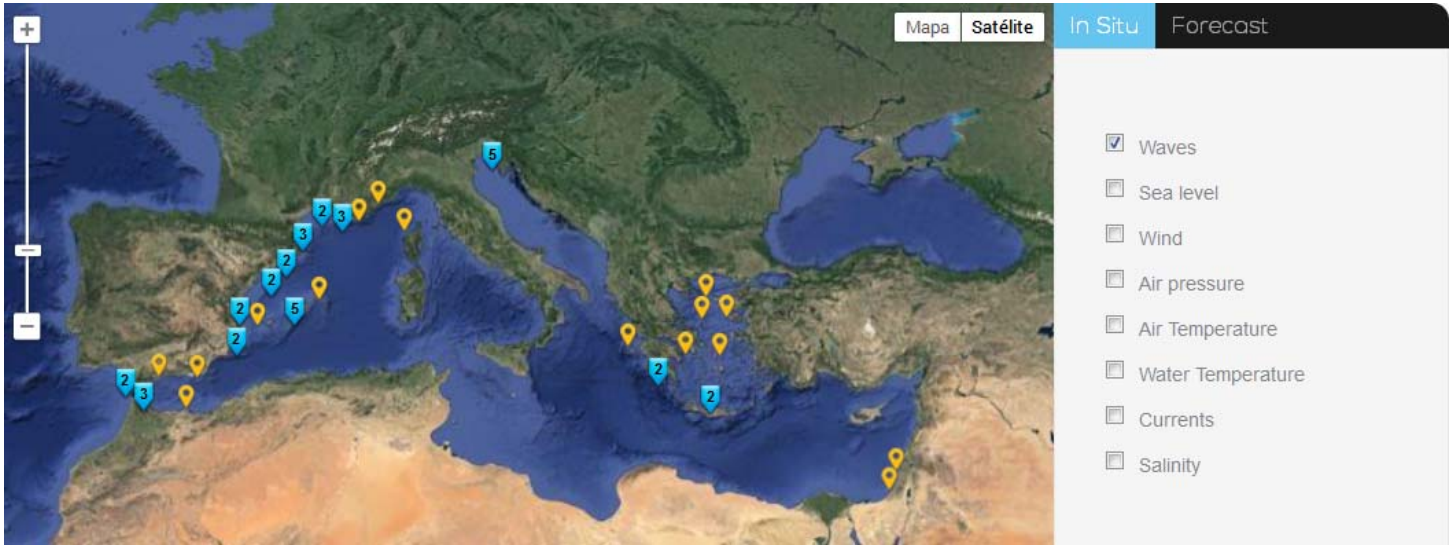






- Some examples

Wave measurements



- No station in Africa
- Still many existing stations missing…

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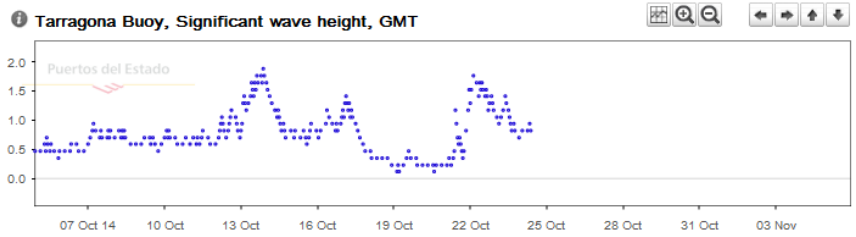
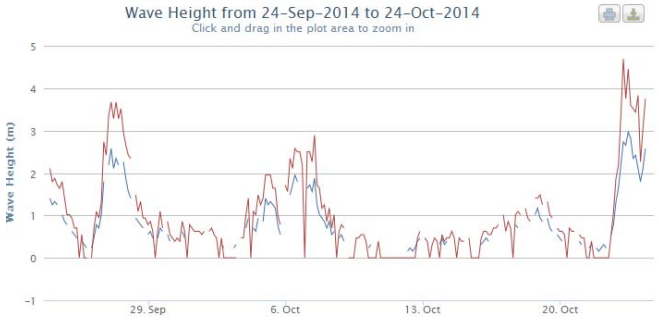
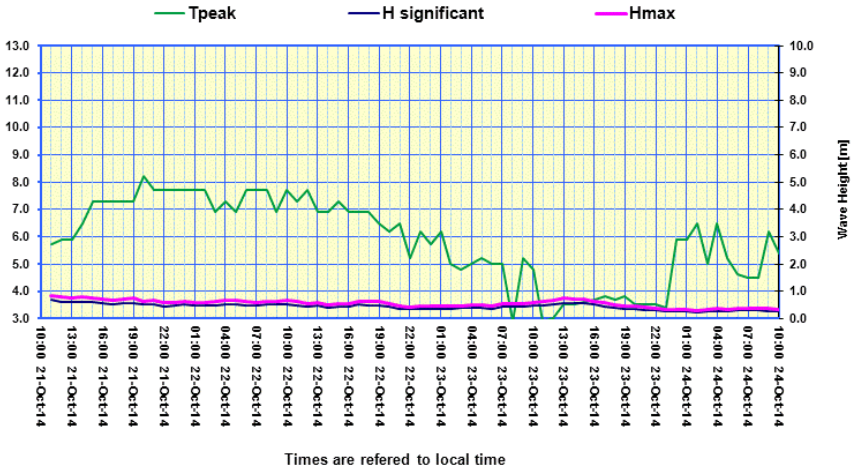
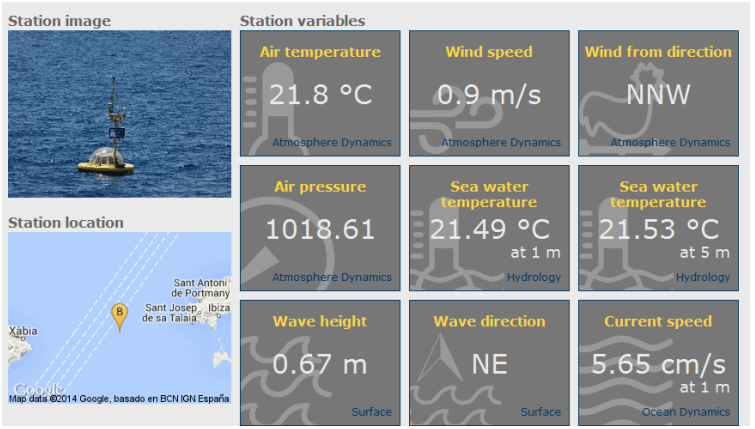
Real time wave measurements









- Some examples

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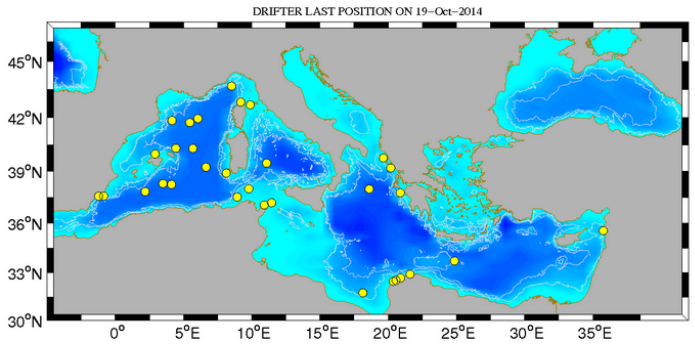
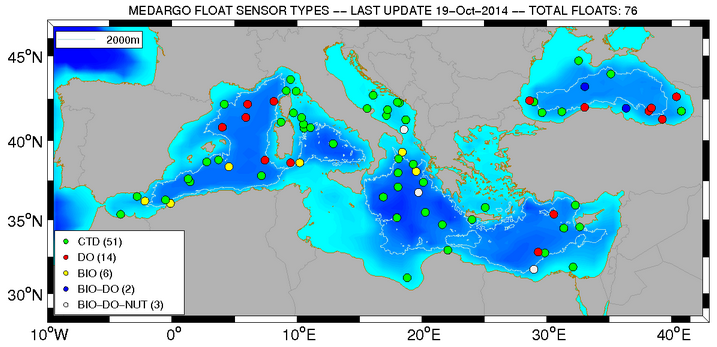
Other sources of data (not in the tool)

HF radar

Gliders

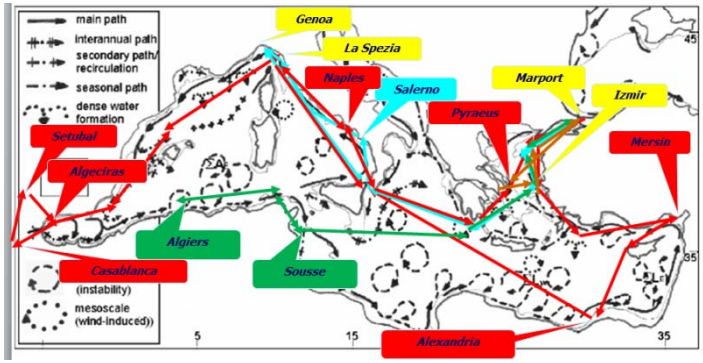
SVP drifters





ARGO floats

Ships of opportunity



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The Mediterranean Data Center

- Collects and process data from Insitu platforms in the Mediterranean Sea
- The regional node for the Insitu component of the Copernicus Marine Core Service (MCS)
- Distributes added value (quality controlled) data in a unique format
- Built through MyOcean I&II, but it supports the Mediterranean observing component of major EU projects in Operational Oceanography (Jerico, Perseus, FixO3).

EMODnet European Marine Observation and Data Network

myOcean

hcmr ΕΛΚΕΘΕ

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Data availability on 20th of October 2014 (1990-now)

198 profilers
56 active

31 Gliders
3 active

78 moorings
52 active

1295 drifters
15 active

184 XBTs
3 active

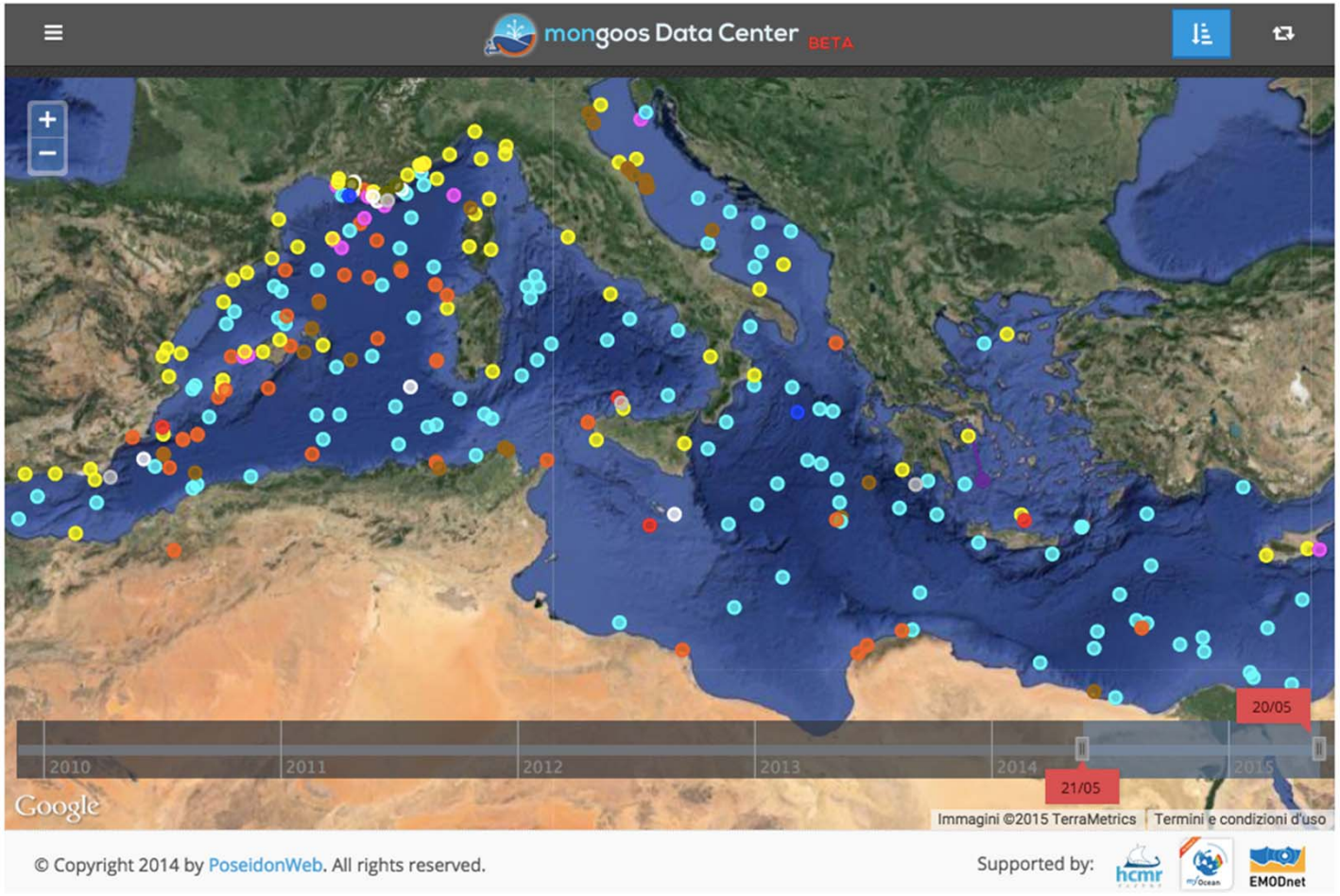
122 CTDs

146 Thermosalinographs
7 active

- 2054 Unique Platforms

myOcean EMODnet hcmr ΕΛΚΕΘΕ mongoos

The Mediterranean Data Center at MonGOOS portal



- Data availability on May2014-May2015

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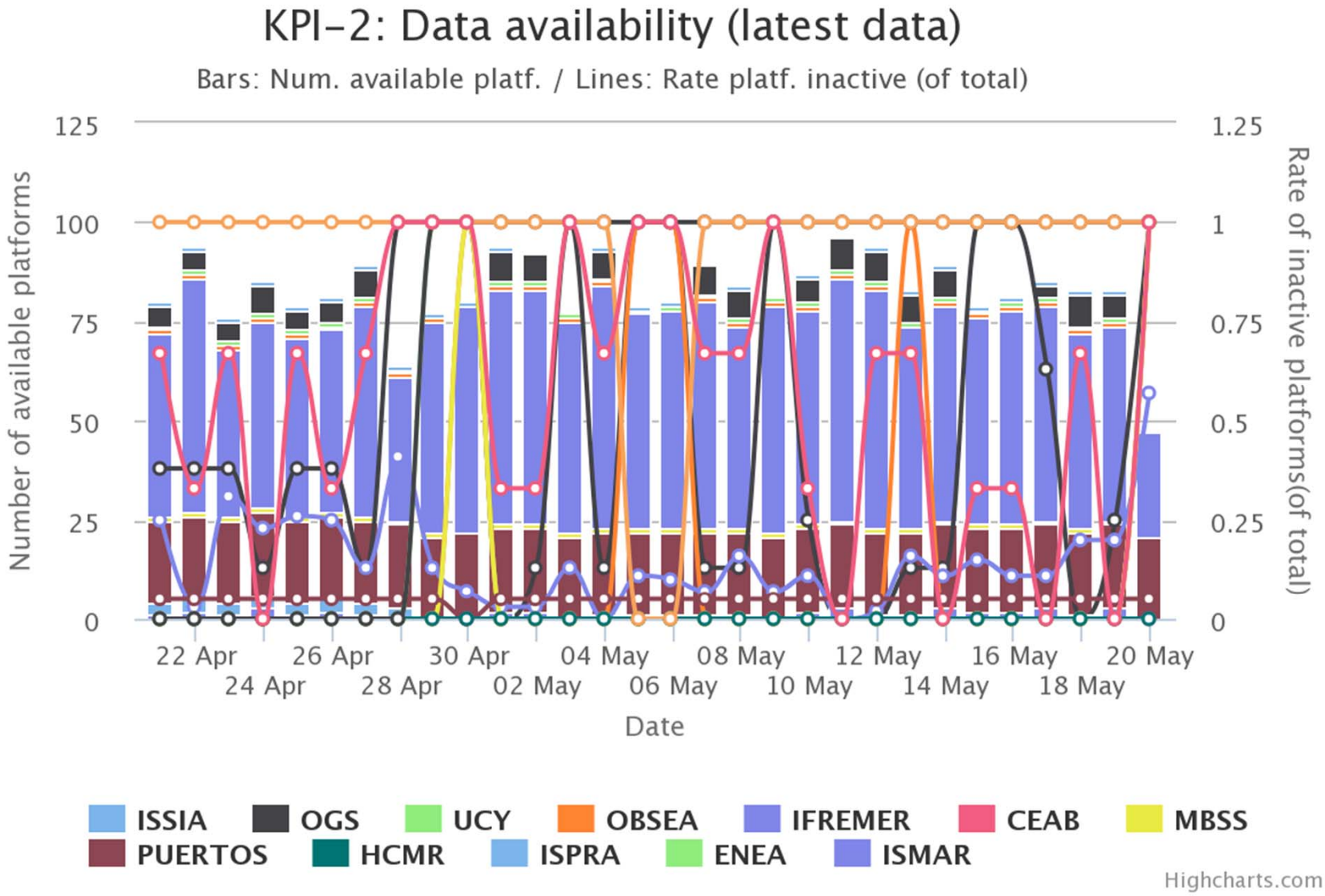
Tr


KPI-2: Data availability (latest data)
Bars: Num. available platf. / Lines: Rate platf. inactive (of total)
Number of available platforms
Rate of inactive platforms(of total)
125
100
75
50
25
0
1.25
1
0.75
0.5
0.25
0
22 Apr
24 Apr
26 Apr
28 Apr
30 Apr
02 May
04 May
06 May
08 May
10 May
12 May
14 May
16 May
18 May
20 May
Date
ISSIA
OGS
UCY
OBSEA
IFREMER
CEAB
MBSS
PUERTOS
HCMR
ISPRA
ENEA
ISMAR
Highcharts.com

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Future strategic lines (plan 2015-2018 – under discussion)

- Increase the level of collaboration and exploitation of synergies with EuroGOOS, AfricaGOOS and Black Sea GOOS.
- Improve Northern African Countries participation in MONGOOS
- Improve collaboration with other organizations, such as UNEP-MAP, UfM, REMPEC, EEA, EMSA, IOC, WMO, JCOMM, EUMETNET, Marine Board, JPI-Ocean, CIESM, etc
- Promote the further development and integration of MONGOOS members Operational Oceanography systems.
- Increase visibility and recognition of MONGOOS and its members

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MONGOOS
Sea Situational Awareness
User-centered Services

Operational oceanography galaxy User-centered approach

Cooperation

Innovation

Scientific challenges

Technology

Environmental threats

Sustainability

Climate change

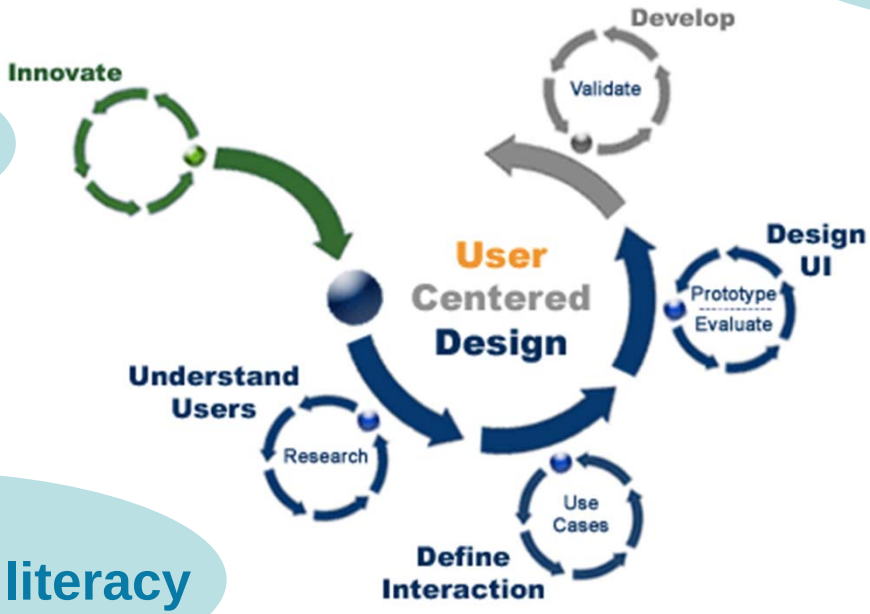
Coastal Ocean literacy

Blue growth

Disasters management

User centered services

Coastal and maritime safety



Sea Situational Awareness User-centered Services

Why? For whom?

Safety of navigation

Coastal protection and erosion

Search and Rescue

Pollution emergencies

Climate Change

Protection&management of maring ecosystems

Off-shore activities

Military activities

Renewable energies

Fishery&acquacolture

Tourism

Harbours

Up stream information (Copernicus Med forecast, Meteo, Observations)

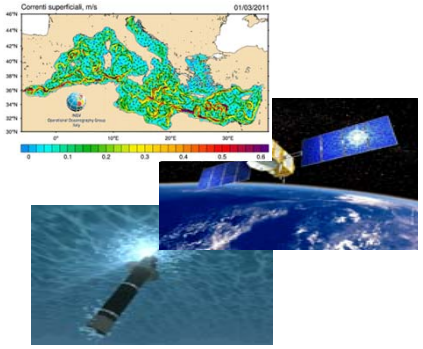
Analysis and Forecasts at high resolution

Information and users' needsservices customised for

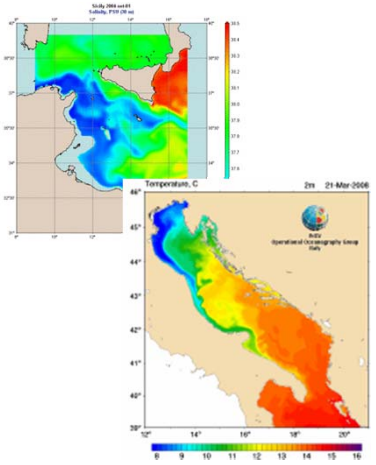
Obs data

Satellite
In situ

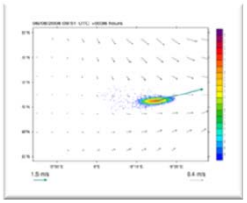
Data from MFS and Meteo



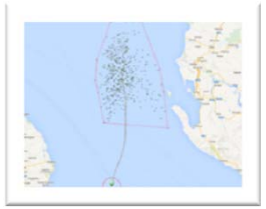
Generic products Med and sub regional



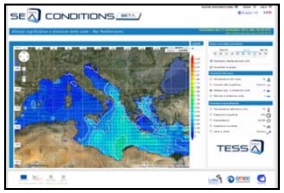
Services of SSA and DSS



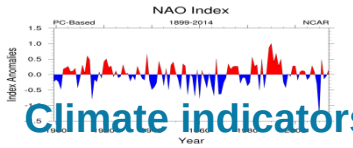
Marine Pollution



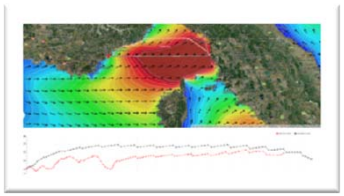
SAR



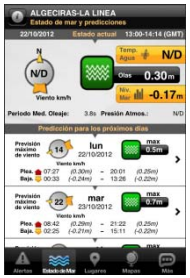
SSA



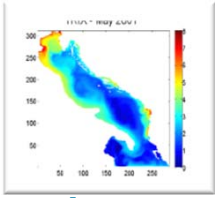
Climate indicators



Ship routing



Harbour services



Marine Env Quality

Storm surge

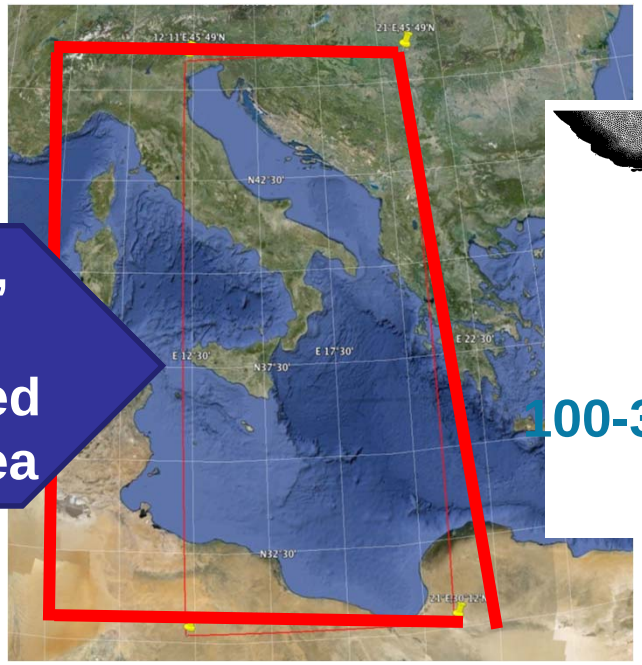
USERS

Maritime transport operators
Yachters
Seaside toursists
Offshore industries
Coast Guards
Port Authorities
Environmental Protection Agencies
Environmental consulting companies
Authorities for defence and safety
Ministries

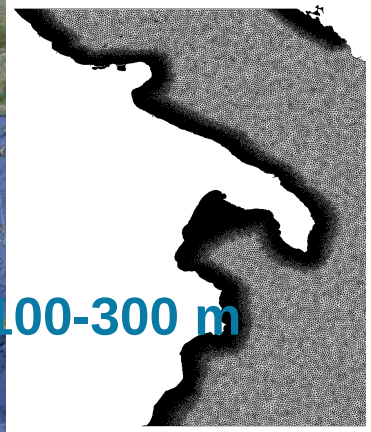
Downstream services from Copernicus: shelf, coastal and port forecasting

- Adding geometry and resolution where is needed without loosing the connection with the open sea

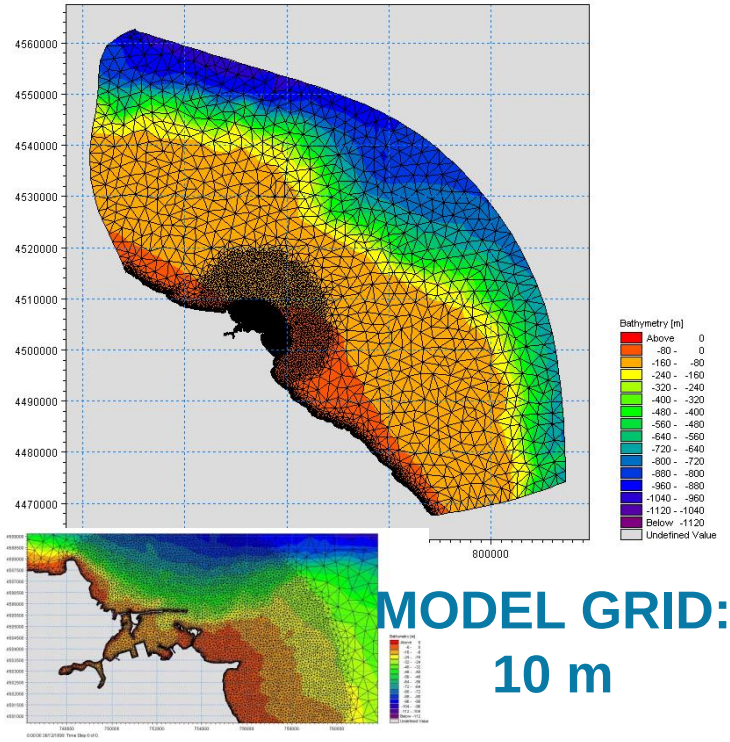
Currents, waves forecasted in the area



MODEL GRID: 2 km



100-300 m



MODEL GRID: 10 m

Implied blue economy sectors :
Research, private companies, engineering consultancy

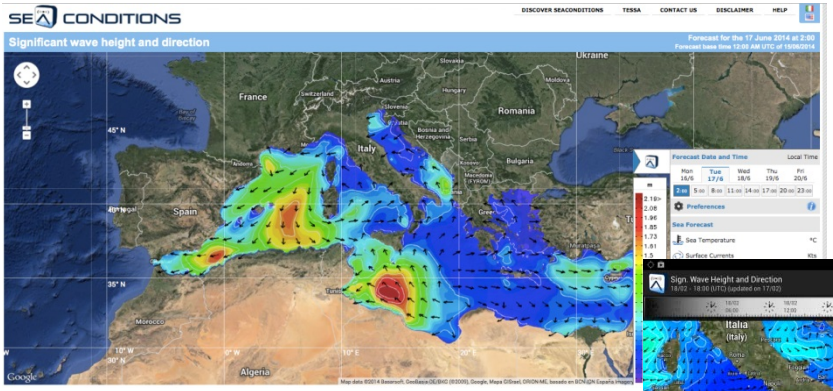
Downstream services from MyOcean: situational sea awareness services

- Situational Sea Awareness technology develops multi-channel services, customized for general public and special users

myOcean

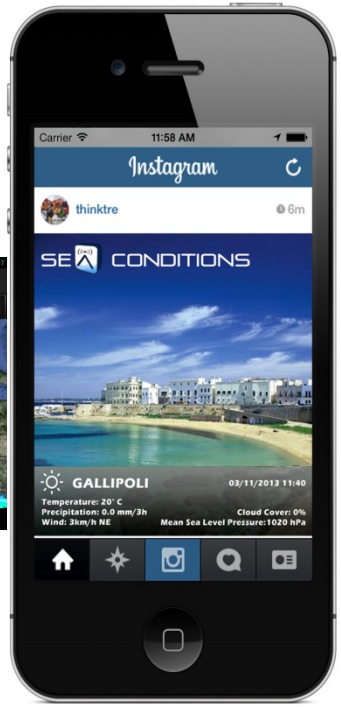
Currents, waves and winds forecasted in the area

Web Portal…



Tablet…

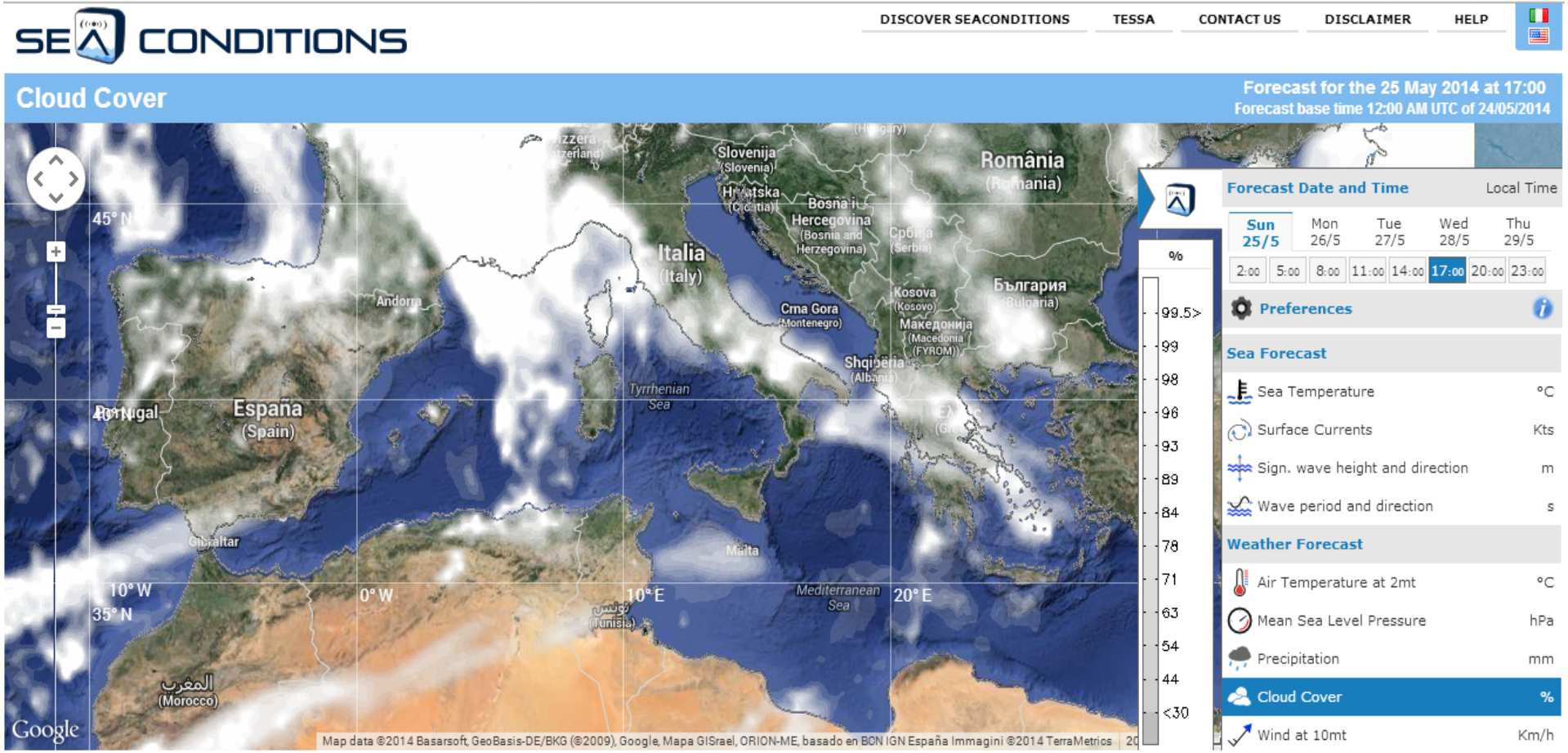
Smartphone…



Implied blue economy sectors : IT companies, transport, tourism

SeaConditions: *the main features*

Forecast on Google maps



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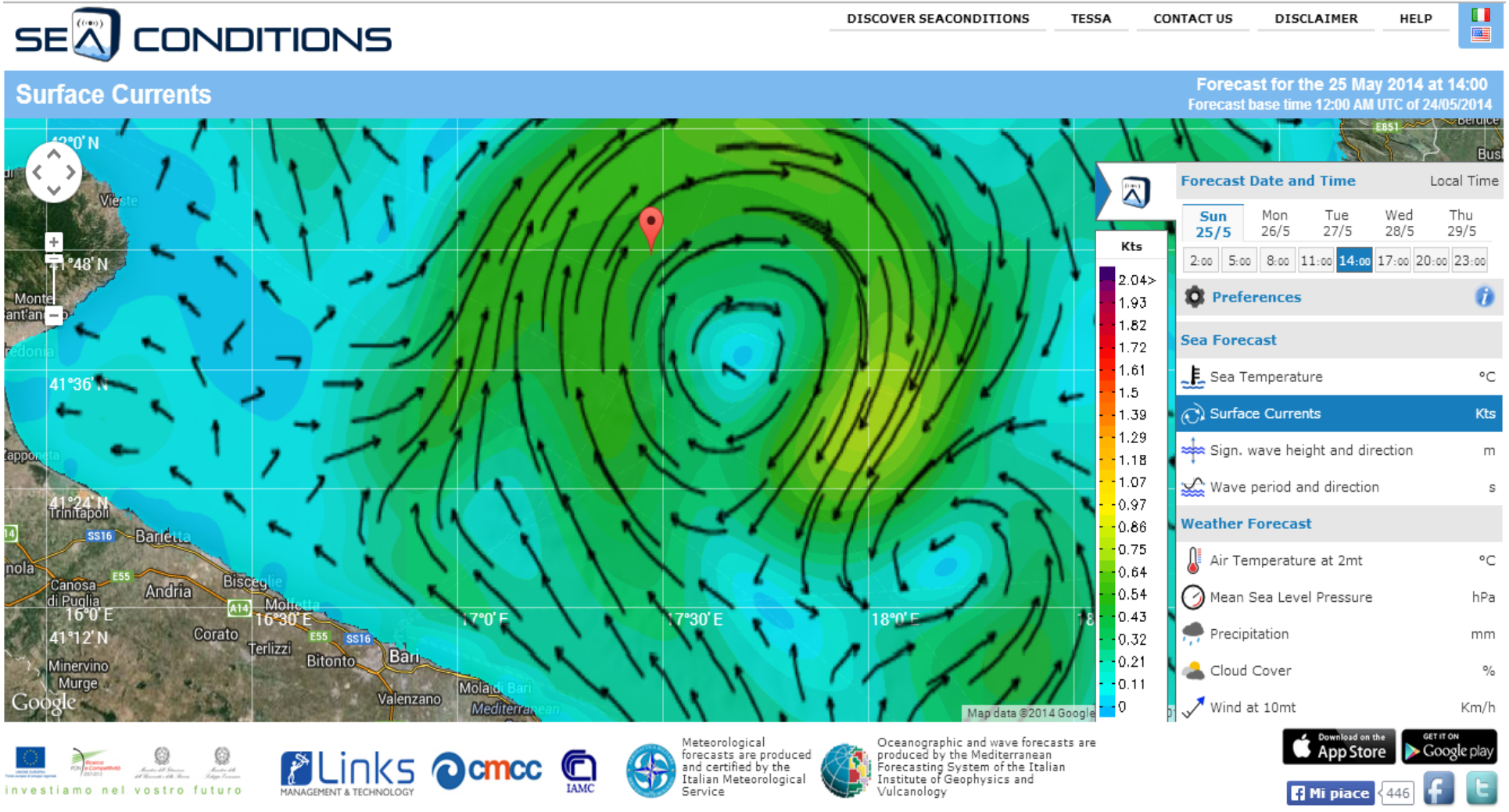
SeaConditions: *the main features*

Interactive maps, with drag and zoom



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Iphone and Android: Imar

Norman Atlantic accident 28 December 2014

Support to Italian Coast Guard

Bulletin for Search and Rescue (Ocean-SAR)

Date: 29/12/2014

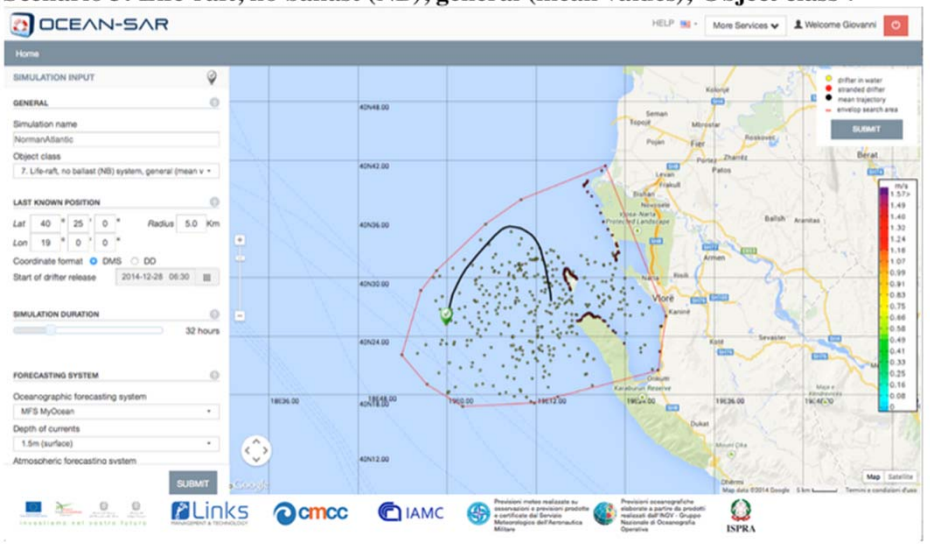
SaR Bulletin n° 3 29/12/2014 for: "*Norman Atlantic accident*"
Contents: SAR scenarios

The bulletin has been produced by CMCC team based on the system developed in the TESSA project (PON2007-2013 http://tessa.linksmt.it)

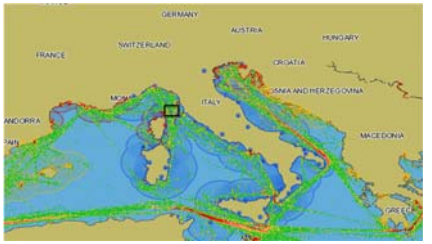
This bulletin is transmitted to the Italian Coast Guard (Comando Generale and Direzione Marittima Bari).

Ship Position: 40° 25' N 019° 00' E

Scenario 3: Life-raft, no ballast (NB), general (mean values); Object class 7



SERIOUS GAMES



First CTD survey

Acquisition of the CleanSeaNet/COSMOSKYMED or optical images available in the area.

METEO MODELS
OCEAN MODELS
WAVE MODELS
OIL SPILL MODELS

Aerial survey to confirm the forecast
- ITCG vessel/airplane -

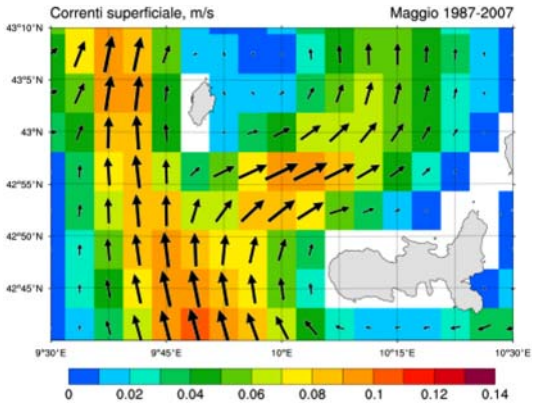
Second CTD survey

DRIFTERS RELEASE ON THE OIL SLICK

Collection of oil/water samples

Aerial Survey or/and
second observation of the oil slick
by satellite (CleanSeaNet or Optical images)

DRIFTERS RECOVERY



CTD data

OCEANOGRAPHIC EULERIAN MODELS
(Currents, Sea Surface Temperature)

Waves

ATMOSPHERIC EULERIAN MODELS
(Winds)

RELOCATABLE MODEL

Relocatable wave model

MEDSLIK-II

Oil slick position from satellite (CSN/COSMOSKYMED or optical images)

Forecast of oil spill position

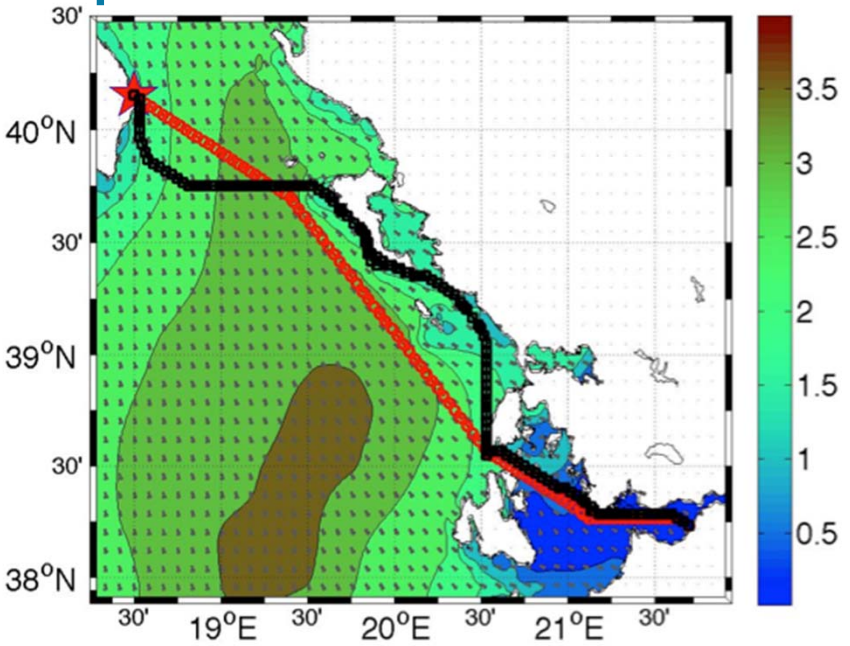
SEARCHING OF THE OIL SLICK IN THE AREA PREDICTED BY THE OIL SPILL MODEL

Downstream services from MyOcean: ship safety and routing

Ferry, fishing Boats, sailing & Yachts routing in the ocean dynamical environment: shortest time with IMO safety constraints

Waves, winds and currents forecasted in the area

Optimal Route Otranto-Patrasso

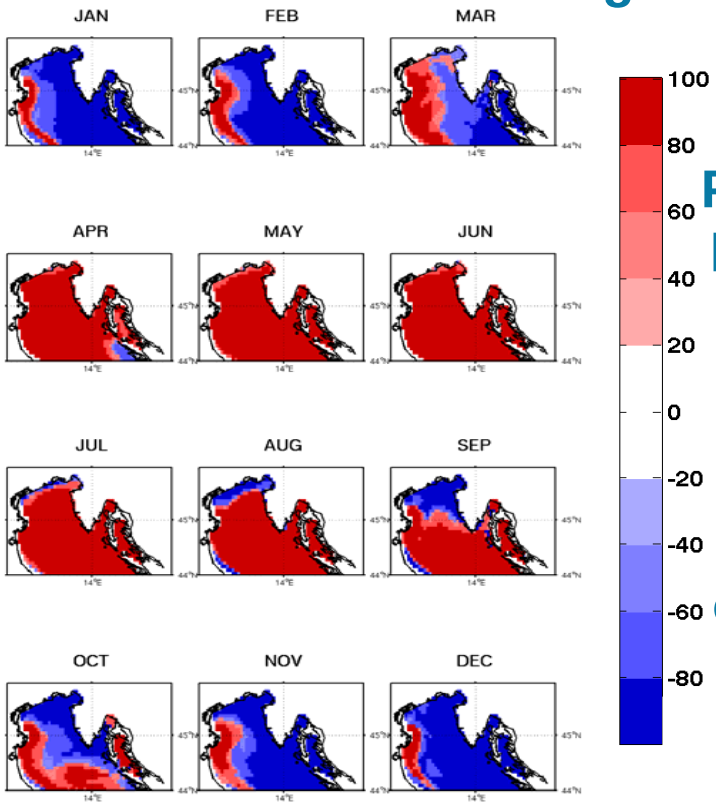


Implied sectors of the blue economy:
Research, naval constructions, transport, tourism

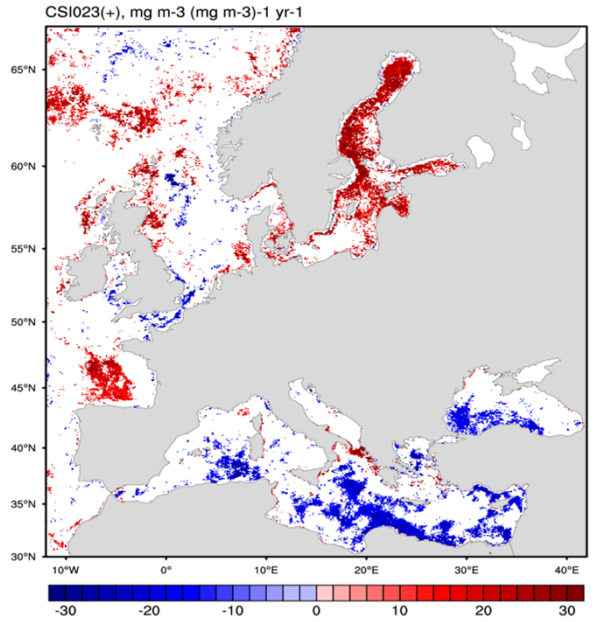
Downstream services from Copernicus
MSFD Indicators

- MSFD indicators are extracted from MyOcean reanalyses/reprocessed satellite data

Northern Adriatic Mixing index



Possible hypoxia



Eutrophication Indicator from ocean color

Well oxygenated waters

Available on Copernicus

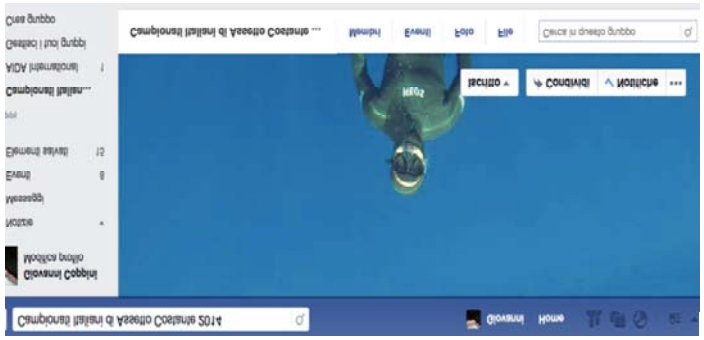
Implied blue economy sectors: EEA, Env. Prot. Agencies

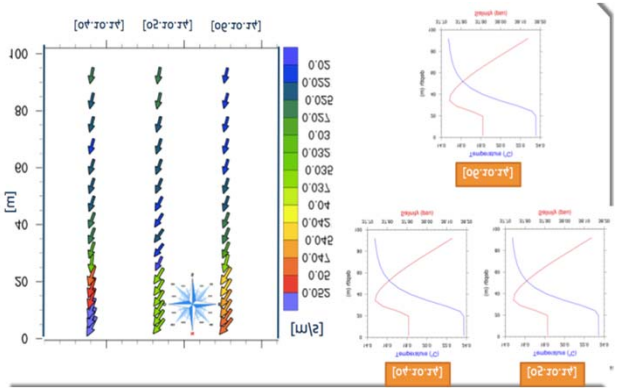
Ocean literacy and dissemination

- Mediterranea Project

- Maritime Days with TESSA/EMODNET, EUROGOOS and COPERNICUS
- Contacts with Union of Mediterranean are undergoing

Support to free diving Italian championship 2014 Ischia, Italy 1-5 October





Conclusions:

- MonGOOS is an active organization for coordinating OO in the Mediterranean Sea. Key role on co-ordination of modeling and observational components in the region
- Further coordination with AfricaGOOS required. We strongly need participation of Northern African countries in MonGOOS
- Model forecasting: State of the art organization and coverage in the area. The relationship with Copernicus is strong and will progressively being enforced
- Lack of data is a limitation for models (even more than in other regions). R&D needed in many topics (data assimilation, ensemble forecasting, advanced storm surge, applications, river-ocean interaction, coastal modeling…)
- In-situ data: dramatic North-South imbalance. Strong fragmentation.

mongoos

Thanks…

…for your contribution to Operational oceanography at European and Mediterranean levels…

…for your always clear and innovative thinking…

…for funding MONGOOS…

…and in top of all …

For allowing us to be your friend

mongoos