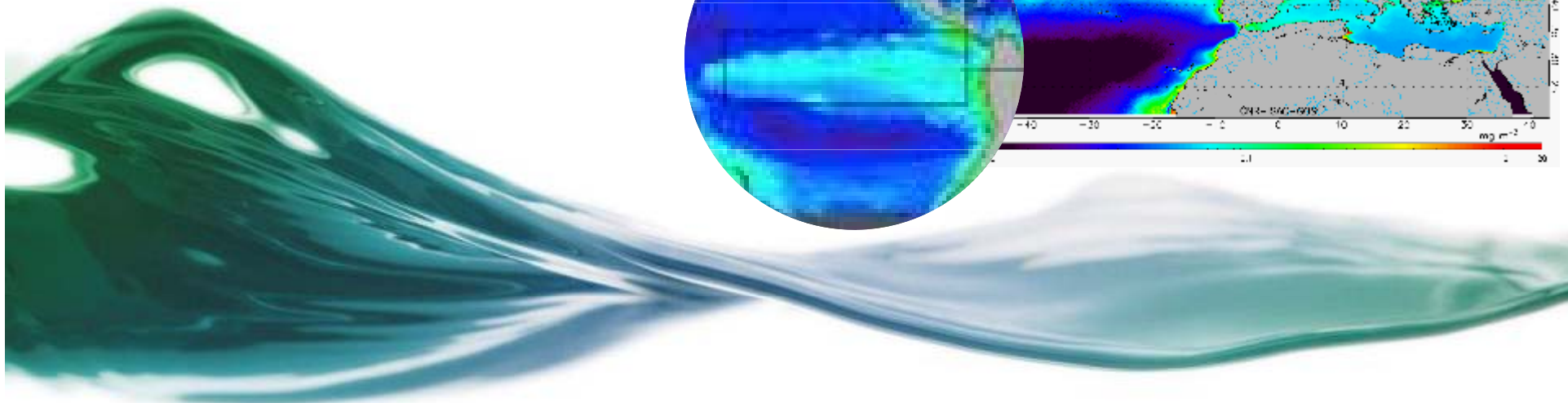
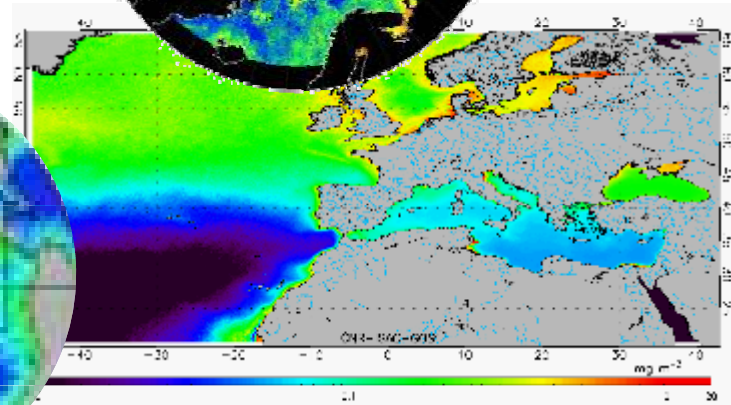
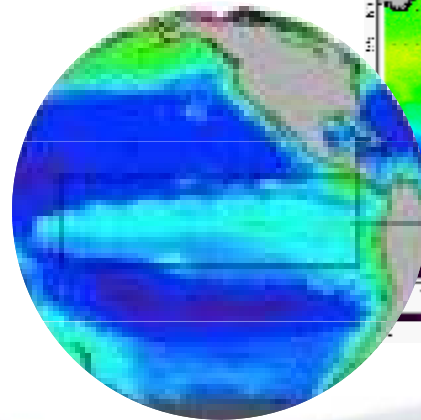
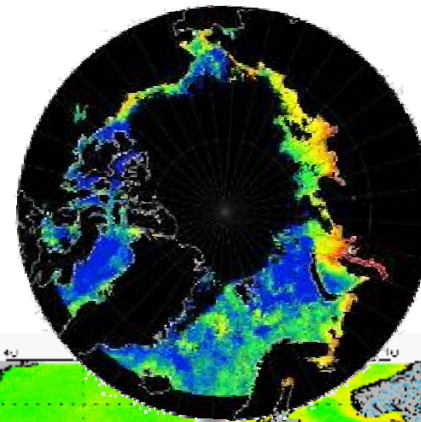


# Servizio Monitoraggio dell'Ambiente Marino di Copernicus



Rosalia Santoleri  
(CNR-ISAC)  
9-10 Giugno, 2015  
Roma



# Outline

- **Introduzione**
- **Che cosa è il Servizio Marino**
- **Da MyOcean a CMEMS: status dell'implementazione**
- **Il ruolo dell'Italia nel Servizio Marino: Passato, Presente e Futuro**
- **Il futuro del Servizio Marino Mediterraneo: criticità e potenzialità**





# Marine service implementation steps with EC



## GMES Implementation (2004-2014)

- FP6 **MERSEA** (2004-2008)
  - Set up a common **R&D**, prepare a system
- FP7 **MyOcean** (2009-2012)
  - Set up a European integrated **system**, and open the service to users
- FP7 **MyOcean2** (2012-2014)
  - Develop and improve the **service**, work for sustainability

## H2020 2014 Work programme

### *Activity 5 – Transition towards Copernicus*

- **MyOcean-Follow On** (2014-2015) designed as a 6-month project in full continuity with MyOcean2 in the frame of H2020
  - Bridging between MyOcean&MyOcean2 and the Copernicus Marine Environment Monitoring Service (April 2015).

## Copernicus (2015-2021)

**CMEMS:** Copernicus Marine Environment Monitoring Service  
Operational service





MyOcean (3 years) & MyOcean2 (2,5 years) & MyOcean FO (6 Months)  
~60 partners from ~28 countries  
~11 M€/year EC Grant

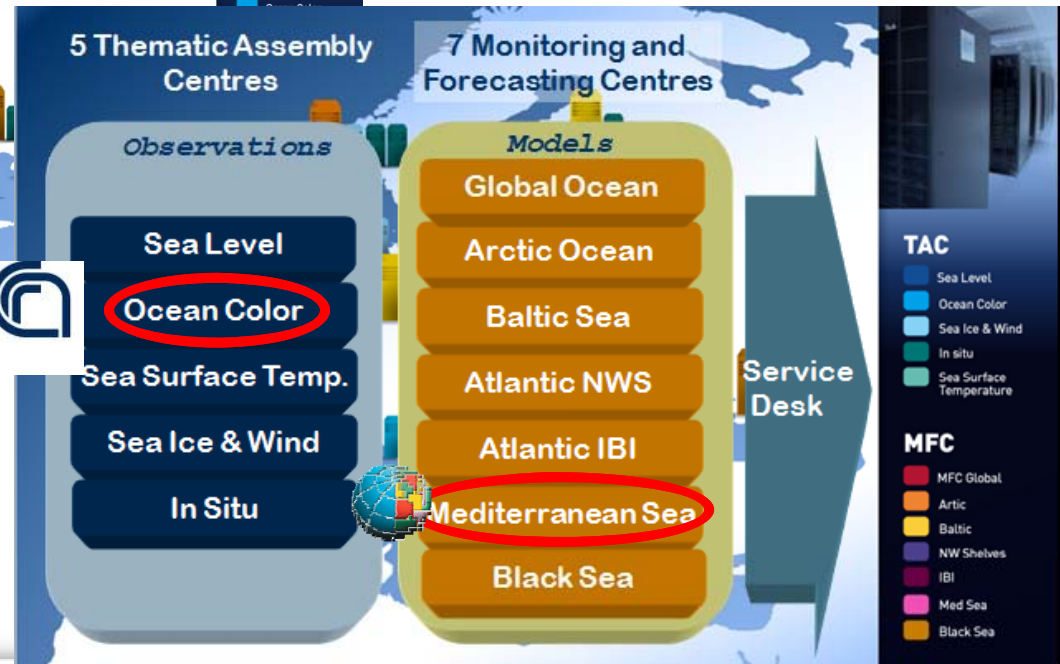




# e) A pan-European system organization to produce marine information

**60 PARTNERS** in FP7 MyOcean & MyOcean2 & MyOcean FO projects

**14 MAIN OPERATORS** for the main service functions



5 THEMATIC ASSEMBLY CENTRES

7 MONITORING AND FORECASTING CENTRES

2 PRODUCTION CENTRES LEAD by ITALY

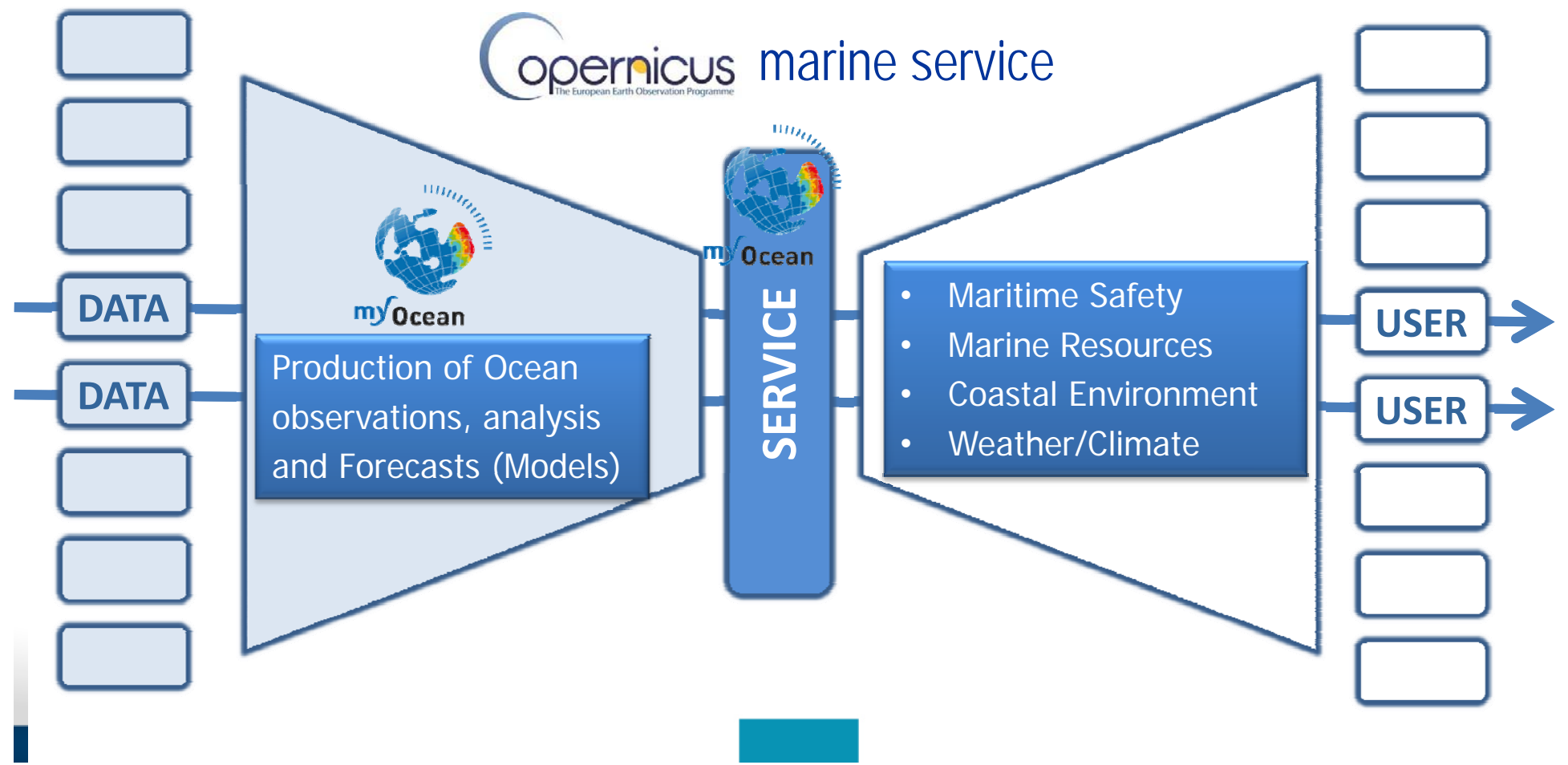




# A Core Service



LET'S EMBRACE SPACE / 15 - 17 September 2014 - Rome, Italy



Copernicus marine service  
The European Earth Observation Programme

Production of Ocean observations, analysis and Forecasts (Models)

myOcean  
SERVICE

- Maritime Safety
- Marine Resources
- Coastal Environment
- Weather/Climate

USER →  
USER →



[mercator-ocean.eu](http://mercator-ocean.eu)  
[marine.copernicus.eu](http://marine.copernicus.eu)




# Il Servizio Marino Copernicus





# The CMEMS Web portal





## COPERNICUS MARINE ENVIRONMENT MONITORING SERVICE

Providing PRODUCTS and SERVICES for all marine applications

Search terms

ABOUT US | BENEFITS | NEWS | SCIENCE & LEARNING | TRAINING | SERVICES PORTFOLIO

### ACCESS TO PRODUCTS

Search and download your datasets!

[FIRST VISIT ?](#)

Select your:

- AREA
- PARAMETERS
- TIME COVERAGE
- OBSERVATIONS/MODELS

- GLOBAL OCEAN
- ARCTIC OCEAN
- BALTIC SEA
- EUROPEAN NORTH WEST SHELF SEAS
- IBERIA-BISCAY-IRELAND REGIONAL SEAS
- MEDITERRANEAN SEA
- BLACK SEA

2015 05 MAY

PDF CATALOGUE | OBSERVATIONS OVERVIEW

ONLINE CATALOGUE | MODELS OVERVIEW

#### SHORT-CUT TO SERVICES


- REGISTER NOW
- ONLINE TUTORIALS
- COLLABORATIVE FORUM

#### LATEST NEWS FLASH

CMEMS:2671  
SEACE\_ARC\_SEACE\_L4\_NRT\_C removed from catalogue  
*Information*

28 MONDAY | EVENTS AGENDA

 PARTNERS AND STAKEHOLDERS


 FOCUS ON


 TRAINING AGENDA

### 8TH JUNE, THE WORLD OCEANS DAY AT UNESCO, PARIS. A ROAD TO THE COP21.

Drum up for the Ocean before the COP21 June 8th 2015 at UNESCO, Paris, France To celebrate the World Ocean Day of the United Nations, happening each year on June 8th, the Intergovernmental Oceanographic Commission of UNESCO (IOC UNESCO) organizes with the Ocean and Climate platform, a full day special event on the ocean and its interaction with climate change.

Under patronage of :



Funded by the European Union 

ABOUT US | PARTNERS & STAKEHOLDERS | BENEFITS

ANY QUESTION?  Get help from the Service Desk



# I Prodotti del Servizio



COPERNICUS MARINE ENVIRONMENT MONITORING SERVICE

## Catalogue of products

May 1, 2015

mercator-ocean.eu / marine.copernicus.eu

### MULTIYEAR MODELS

AREA	PRODUCTS	CHARACTERISTICS					
REFERENCES	PARAMETERS	HORIZONTAL AND VERTICAL RESOLUTIONS	TEMPORAL COVERAGE (START DATE, END DATE)	TEMPORAL RESOLUTION	UPDATE FREQUENCY	DATA ASSIMILATED	
GLOBAL	Phy	T 6 UV SeaIce MLD	14°/24km, 75 levels	01/01/2007 01/01/2015	6h	A	●●●●
		T 5 UV SeaIce	14°/24km, 50 levels	01/01/1982 10/12/2012	6h	A	●●●●
		T 5 UV SeaIce MLD	14°/24km, 75 levels	01/01/1982 10/12/2012	6h	A	●●●●
		T 5 UV SeaIce MLD	14°/24km, 75 levels	01/01/1982 10/12/2012	6h	A	●●●●
ARCTIC	Phy	T 5 UV SeaIce MLD	12 km, 12 levels	01/01/1981 10/12/2012	6h	A	●●●●
	Sea	CHL CO2 N.P. Phy, KdFlux	20 km, 12 levels	01/01/2007 10/12/2012	6h	A	●●●●
BALTIC	Phy	T 5 UV SeaIce	3 km, 8 levels, 50 levels	01/01/1980 31/12/2012	6h	A	●●●●
	Phy	T 5 UV SeaIce	3 km, 8 levels, 25 levels	01/01/1980 31/12/2012	6h	A	●●●●
NWES European North West Shelf Seas	Phy	T 5 UV SeaIce	3 km, 8 levels, 25 levels	01/01/1980 31/12/2012	6h	A	●●●●
	Phy	T 5 UV SeaIce	3 km, 8 levels, 25 levels	01/01/1980 31/12/2012	6h	A	●●●●
	Phy	T 5 UV SeaIce	3 km, 8 levels, 25 levels	01/01/1980 31/12/2012	6h	A	●●●●
	Phy	T 5 UV SeaIce	3 km, 8 levels, 25 levels	01/01/1980 31/12/2012	6h	A	●●●●
BS North Sea and British Regional Seas	Phy	T 5 UV SeaIce	11/2°/3km, 50 levels	01/01/2002 23/12/2011	6h	A	●●●●
	Phy	T 5 UV SeaIce	11/2°/3km, 50 levels	01/01/2002 23/12/2011	6h	A	●●●●
	Phy	T 5 UV SeaIce	11/2°/3km, 50 levels	01/01/2002 23/12/2011	6h	A	●●●●
	Phy	T 5 UV SeaIce	11/2°/3km, 50 levels	01/01/2002 23/12/2011	6h	A	●●●●
MED Mediterranean Sea	Phy	T 5 UV SeaIce	11/1°/4km, 72 levels	01/01/1987 31/12/2011	6h	A	●●●●
	Phy	T 5 UV SeaIce	11/1°/4km, 72 levels	01/01/1987 31/12/2011	6h	A	●●●●

### MODEL PRODUCTS OVERVIEW

MAY 2015

All the products described in this brochure can be downloaded on marine.copernicus.eu

A question? Contact the Copernicus Service Desk, service@copernicus.eu

### MULTIYEAR OBSERVATIONS

AREA	PRODUCTS	CHARACTERISTICS					
DATA SOURCE	PARAMETERS	HORIZONTAL AND VERTICAL RESOLUTIONS	TEMPORAL COVERAGE (START DATE, END DATE)	TEMPORAL RESOLUTION	UPDATE FREQUENCY	PROCESSING LEVELS	
GLOBAL	SATELLITE	SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
		MCT	25km, 1 level (surface)	N/A	6h	6h	●●●●
		SEA_NOISE_MPT	25km, 1 level (surface)	N/A	6h	6h	●●●●
		SEA_NOISE_MPT	25km, 1 level (surface)	N/A	6h	6h	●●●●
		SEA_NOISE_MPT	25km, 1 level (surface)	N/A	6h	6h	●●●●
		SEA_NOISE_MPT	25km, 1 level (surface)	N/A	6h	6h	●●●●
	IN-SITU	Phy	4km, 1 level (surface)	04/08/1987 31/07/2012	6h	A	●●●●
		Phy	4km, 1 level (surface)	04/08/1987 31/07/2012	6h	A	●●●●
		Phy	12km, 1 level (surface)	01/01/1982 31/12/2012	6h	A	●●●●
		Phy	25km, 1 level (surface)	01/01/2007 01/01/2012	6h	A	●●●●
		Phy	14°/24km, 75 levels	01/01/1982 31/12/2012	6h	A	●●●●
		Phy	14°/24km, 75 levels	01/01/1982 31/12/2012	6h	A	●●●●
ARCTIC	SATELLITE	SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
		SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
	IN-SITU	Phy	4km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
		Phy	4km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
BALTIC	SATELLITE	SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
	IN-SITU	Phy	4km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
NORTH ATLANTIC	SATELLITE	SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
	IN-SITU	Phy	4km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
EUROPEAN NWES	IN-SITU	SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
		SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
	SATELLITE	MCT	25km, 1 level (surface)	04/08/1987 31/07/2012	6h	6h	●●●●
		SEA_NOISE_MPT	25km, 1 level (surface)	04/08/1987 31/07/2012	6h	6h	●●●●
MED Mediterranean Sea	SATELLITE	SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
		SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
	IN-SITU	SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
		SEA	14°/24km, 1 level (surface)	01/01/1982 10/12/2012	6h	A	●●●●
BS North Sea	SATELLITE	SEA	11/2°/3km, 50 levels	01/01/2002 23/12/2011	6h	A	●●●●
		SEA	11/2°/3km, 50 levels	01/01/2002 23/12/2011	6h	A	●●●●
	IN-SITU	SEA	11/2°/3km, 50 levels	01/01/2002 23/12/2011	6h	A	●●●●
		SEA	11/2°/3km, 50 levels	01/01/2002 23/12/2011	6h	A	●●●●

### OBSERVATION PRODUCTS OVERVIEW

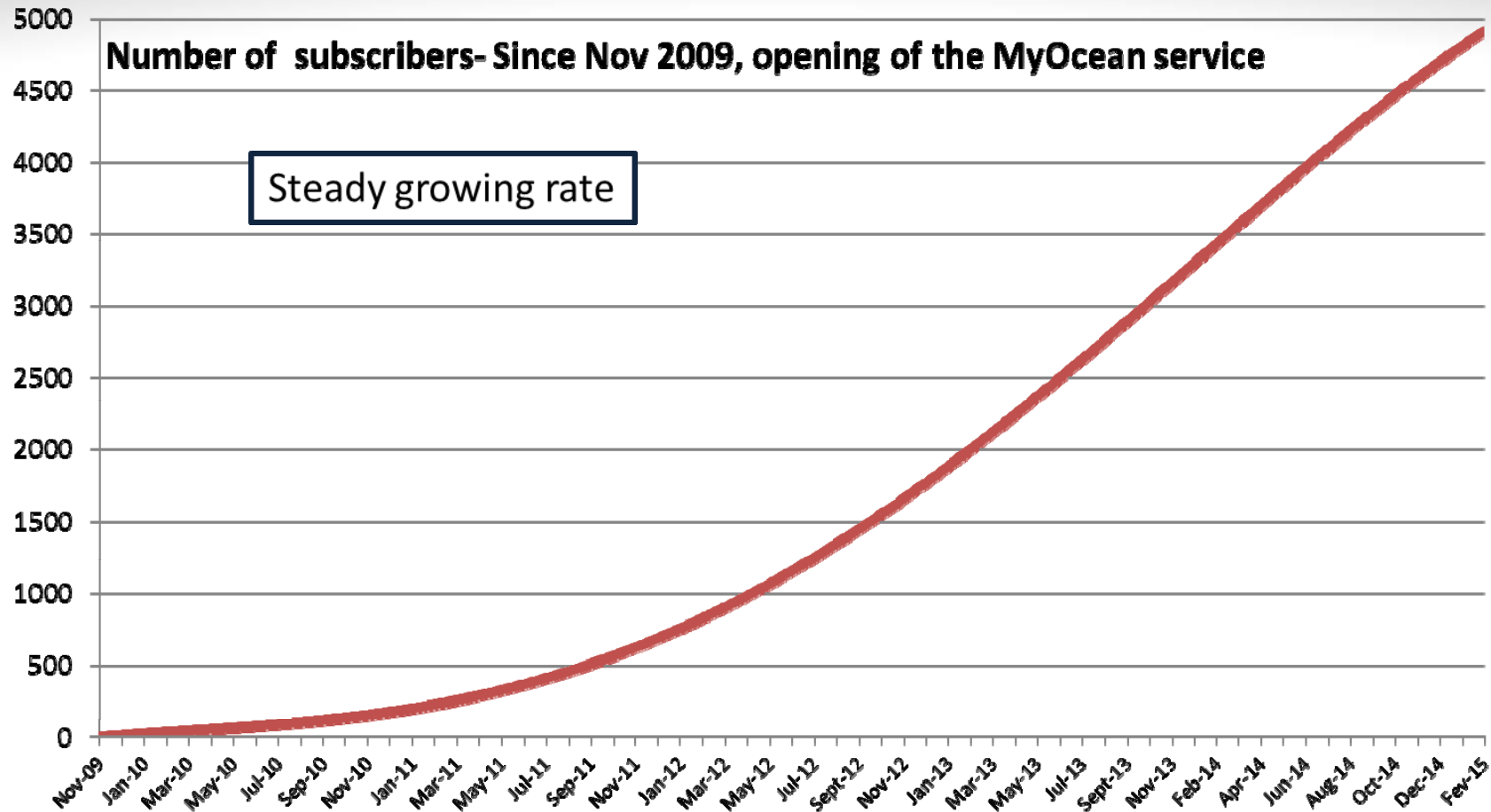
MAY 2015

All the products described in this brochure can be downloaded on marine.copernicus.eu

A question? Contact the Copernicus Service Desk, service@copernicus.eu



# Status of the Service



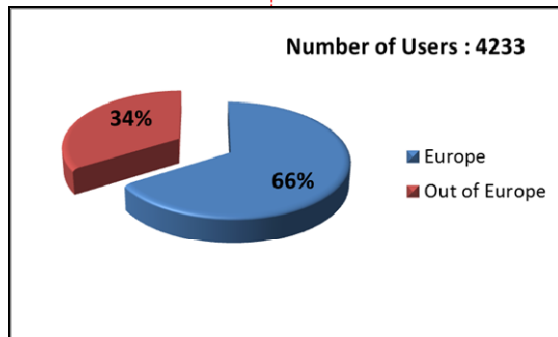
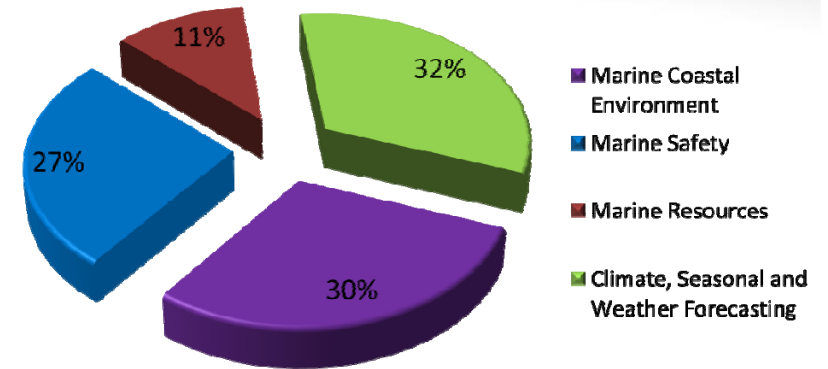
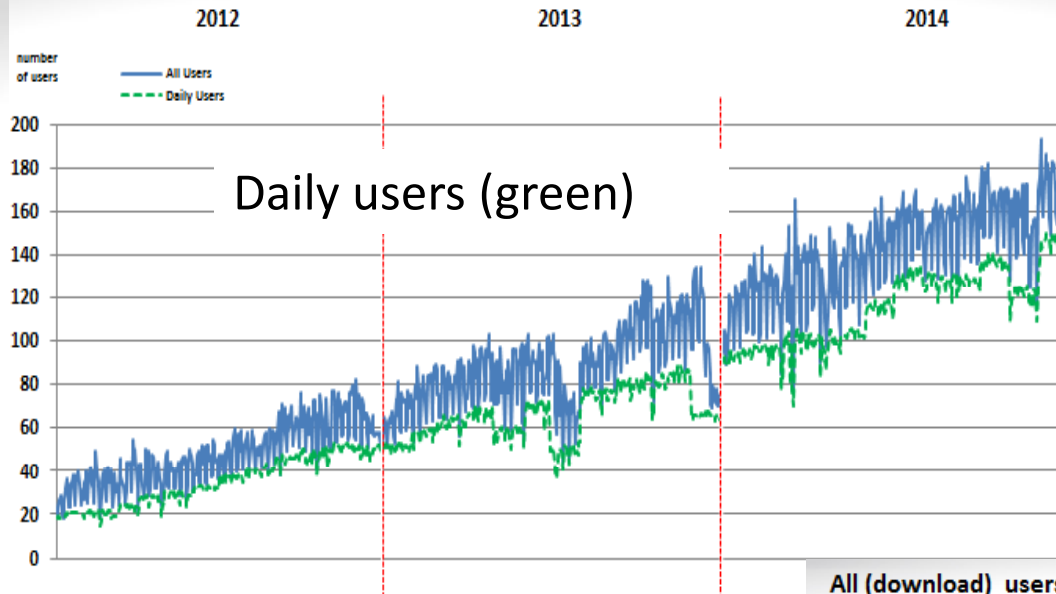
## 2014:

- 94 Tbytes downloaded (+78% vs 2013)
- 14 000 000 download transactions (+200% vs 2013)



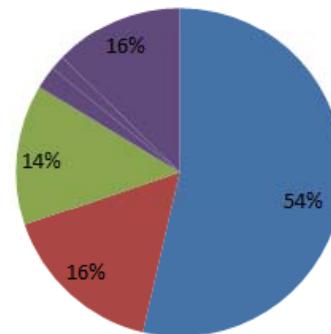


# Status of the Service



364 regular users in 2014  
 19% National Services  
 21% Business Company

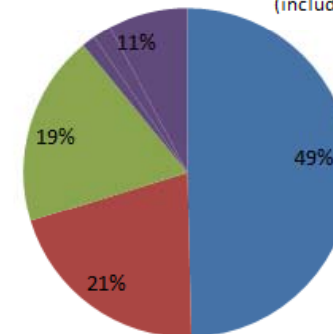
**All (download) users 2014**



- University Educational Research
- Business Company
- National\_Meteorological and or Oceanographic Service public sector
- Other

**Regular users 2014**

Regular users: download products at least 3 times in different weeks within a month (include daily users)





[mercator-ocean.eu](http://mercator-ocean.eu)  
[marine.copernicus.eu](http://marine.copernicus.eu)



# Il Servizio Marino da MyOcean a Copernicus





# CMEMES: implementazione



**Novembre 2014: EU affida ad Mercator Océan l'implementazione del «Copernicus Marine Environment Monitoring Service» (CMEMS).**

**•Delegation Agreement signed: Nov 2014 –March 2021**

**Gennaio 2015: Mercator Océan apre le tenders:**

- 4 Thematic Assembly Centres ; 5 Monitoring and Forecasting Centres**
- Open procurement procedure; publication / competition/ evaluation/ selection**
- Contracts awarded mid-April**

**May 2015: Mercator Océan da inizia al servizio CMEMS e termina il servizio MyOcean**

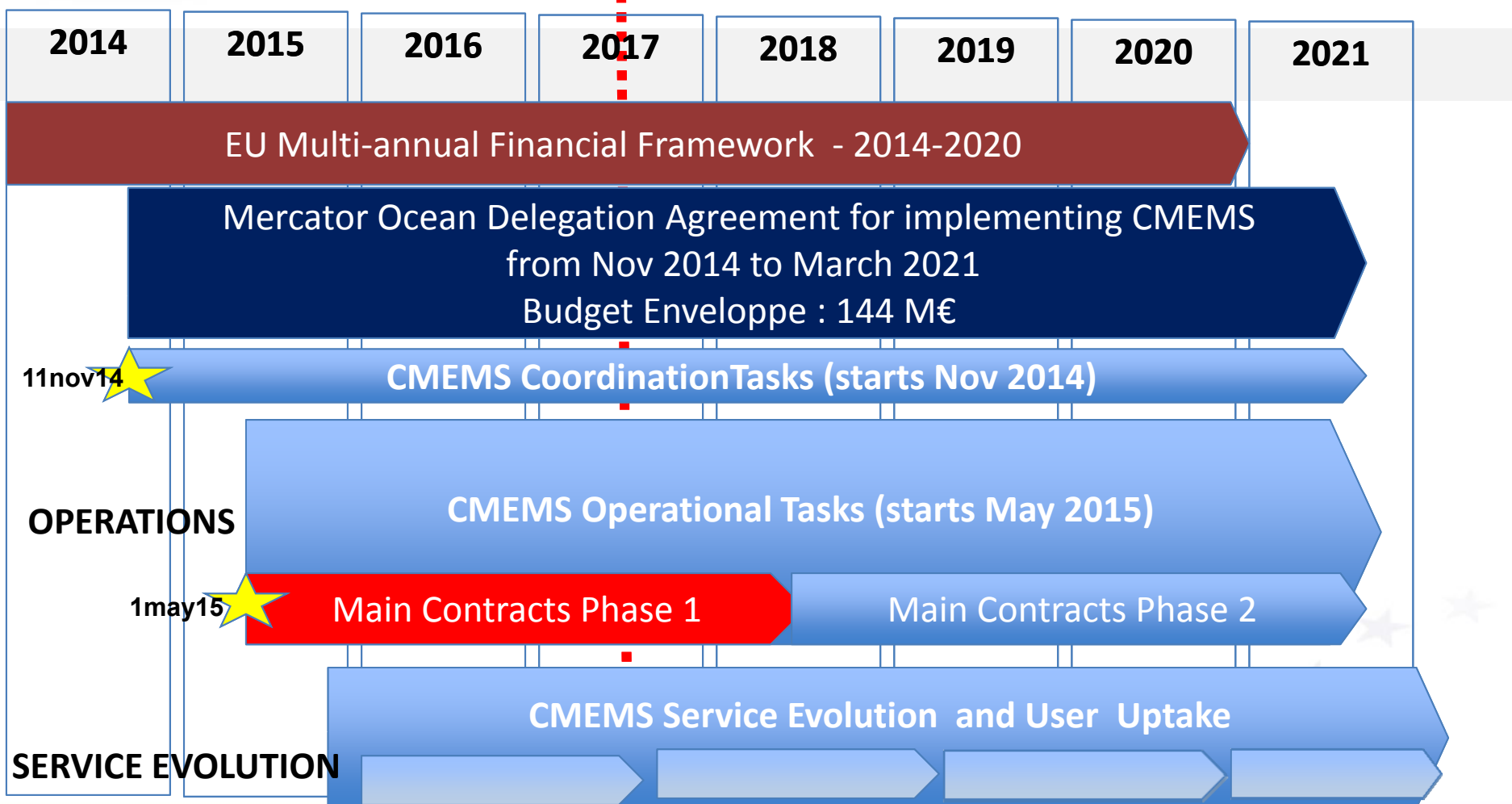
- Per gli utenti non cambia nulla;**
- MyOcean V5 = CMEMS v1**



# Timelines



Mid-term  
evaluation



# CMEMS technical « internal » Framework: building blocks

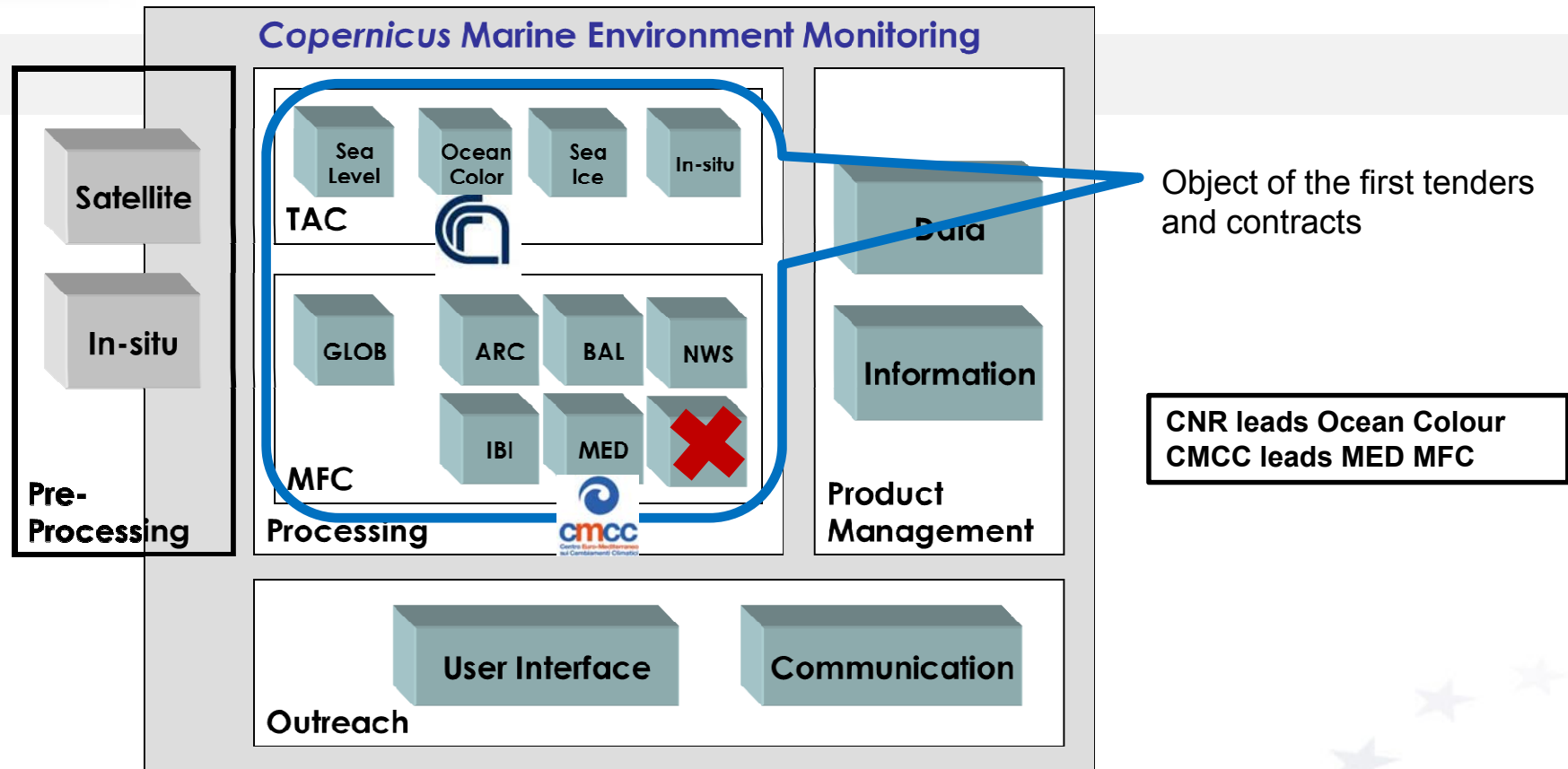


Figure 1: System overview of Copernicus Marine Environment monitoring service chain as presented by the European Commission to the GMES/Copernicus User Forum.

From the Technical Annex of the Delegation Agreement between the EU and Mercator Ocean



# CMEMS technical Framework: Production Centres



- **9 Production Centres:**
  - 4 Thematic Assembly Centres (TACs): Sea Level, Ocean and Sea Ice, Ocean Colour, In Situ
  - 5 Monitoring and Forecasting Centres: Mediterranean, Iberia-Biscay-Ireland, North West Shelves, Arctic, Baltic
  - The Global MFC is managed by Mercator Ocean: not formally part of the contracts
- **Main short term objective: Continuity of Service with respect to MyOcean:**
  - Needs Production Centres in place, operational on 01/05/15
  - Needs stable central infrastructure (Central Information System) to perform integration. The tender for CIS will be open by end of the year
- **Going further**
  - User uptake tenders to reach new community of users (ex: downstream sector)
  - Service proposed by area of benefit (marine safety, coastal & marine environment, marine resources, weather, climate & seasonal forecasting)

**Service evolution and user uptake strategy workshop – Sept. 7&8, 2015, Brussels**





# Scientific Vision



## Principles

CMEMS must remain **state-of-the art and competitive** for its different product lines: level 3 & 4 data products, analyses and short term prediction (physics and biogeochemistry), reanalyses (physics and biogeochemistry).

This should be **regularly checked** and (independantly) assessed.

System improvements are part of service evolution activities. They are both **User and Science** driven. Need **a common and agreed long term service evolution strategy** (MO responsibility – inputs needed 3 year/6 year plans).

Service evolution activities should remain phased between MFCs and TACs (with specificities) (single European service).

# CMEMS in Operation: risultati delle prime Tenders



Mercator Océan opererà il servizio di Copernicus Marine Service con 9 consorzi (~40 partners), coordinati da:

- **NERSC, for the ARC MFC**
- **DMI, for the BAL MFC**
- **Met Office, for the NWS MFC**
- **Puertos del Estado, for the IBI MFC**
- **CMCC, for the MED MFC**
- **CLS, for the SL TAC**
- **Met Norway, for the OSI TAC**
- **CNR, for the OC TAC**
- **Ifremer, for the In Situ TAC**

**Presenza Italiana in CMEMS :**

**OC TAC : CNR**

**MED MFC: CCMC, INGV, OGS**

**OSI TAC: CNR**

**IN Situ TAC: OGS**

Leadership del **OC TAC** e **MED MFC** è rimasta in Italia.

Italia è responsabile della produzione dei:

- **Prodotti di Previsione sull'Area Mediterranea (fisici e biogeochimici)**
- **Prodotti satellitari per il Mediterraneo e Mar Nero (SST, OC) + Baltico (OC)**
- **Prodotti in SITU (T&S) x MED**
- **Disseminazione di dati di previsione MED**
- **Disseminazione dei dati satellitari: OC, SST, Vento per l'oceano globale e per tutti mari europei**

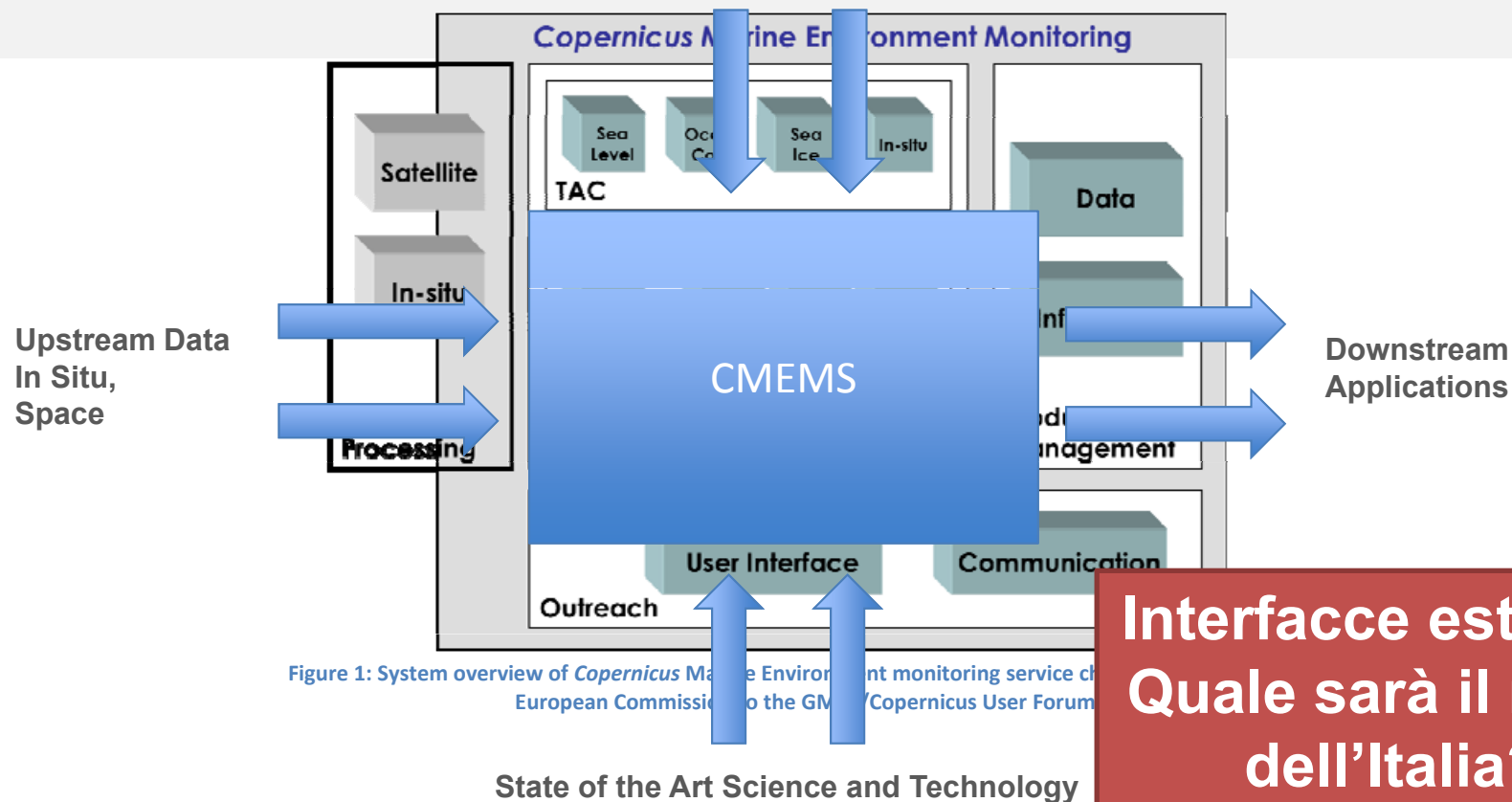
**A parte la Francia l'Italia è l'unico paese che coordina due centri di produzione di CMEMS**



# CMEMS: external environment Interfaces, stakeholders



CMEMS Stakeholders:  
EC, DGs, European Agencies,  
Users (all types)

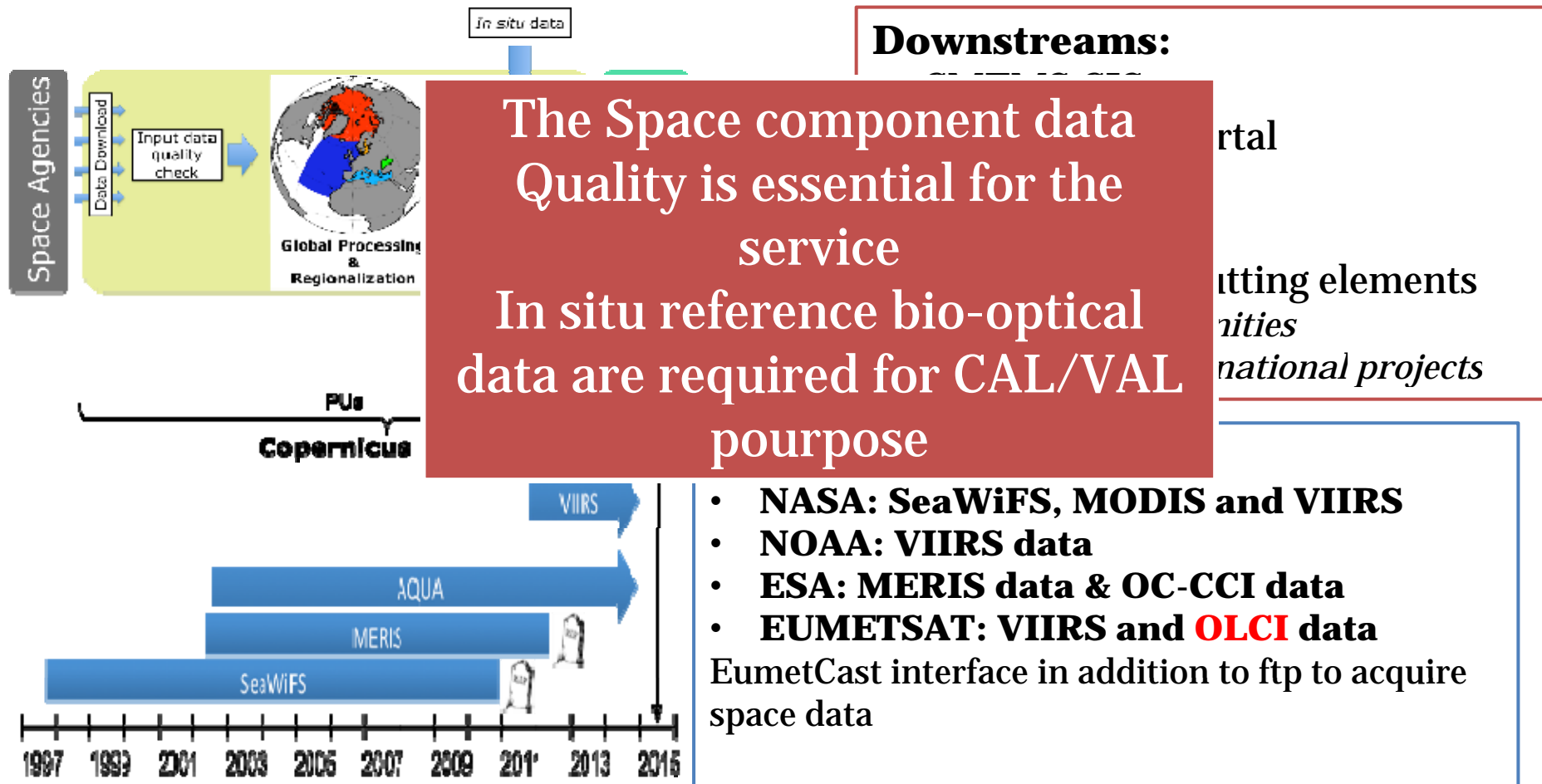


**Interfacce esterne:  
Quale sarà il ruolo  
dell'Italia?**

# OCTAC Architecture evolution: interfaces

## In situ Upstreams:

- **CMEMS IN SITU**
- Public data: NOMAD, SeaBass, MERMAID, **AERONET-OC**
- Partners data (eg. Cruise data, **CNR buoy data**)





# CMEMS in 2021: Mercator Vision



- A « marine service », prominent component of Copernicus, recognized by stakeholders for its **unique marine information and knowledge**, demanded by MS

RECOGNITION

- A « **Europeanized** » service, on behalf of the marine users

## QUALE SARA' II RUOLO DELL'ITALIA?

La Leadership sul settore marino deve essere mantenuta e rafforzata.

LEADERSHIP

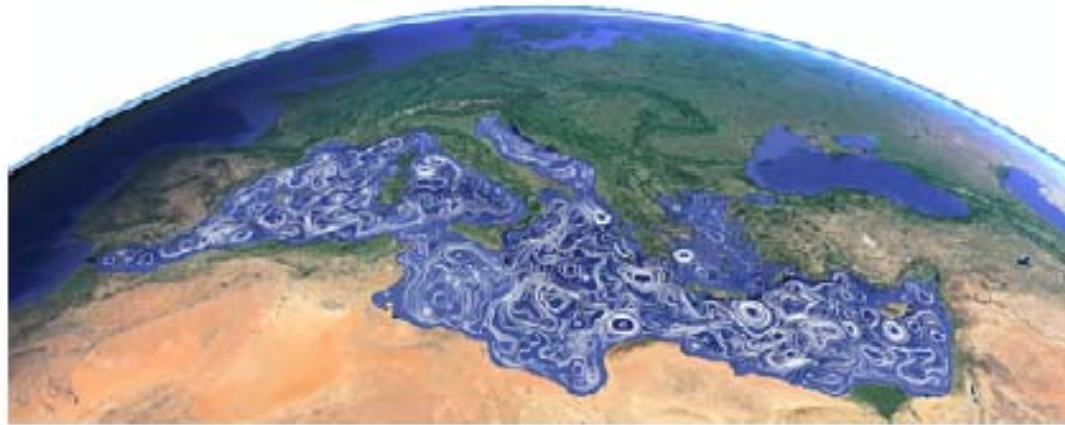
- A **well entrenched** service, with excellent science and a strong effort on marine data

L'Italia dovrebbe entrare nel Mercator Europeo e portare la sua visione e le sue esigenze

ENGAGEMENT

- A large number of **users in all sectors**, thanks to us and to our 1st rank users serving their own communities

UPTAKE

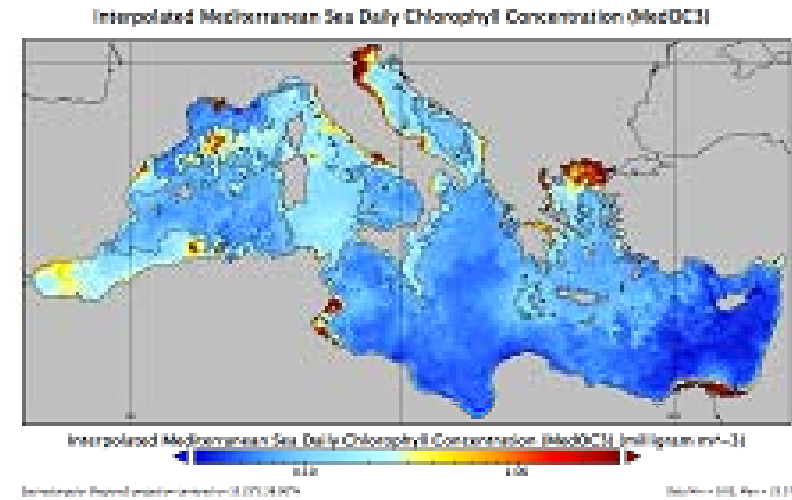
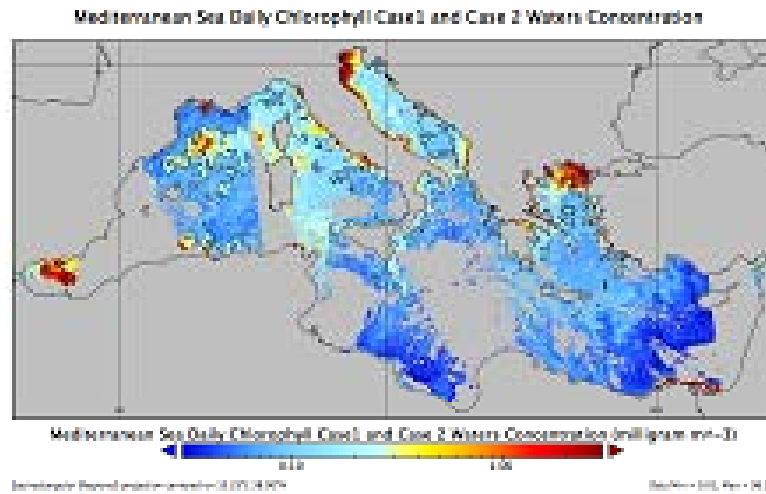


# I prodotti Mediterranei del servizio Marino





# Ocean Colour Products



Ocean Region	NRT L3	NRT L4	REP L3	REP L4
Mediterranean Sea	single & Multi MODIS & VIIRS & OLCI	Multi	Multi (SeaWIFS+MODIS+MERIS)	Multi Based on L3

**NRT: products** within few hours, NRT replaced by **consolidated product**

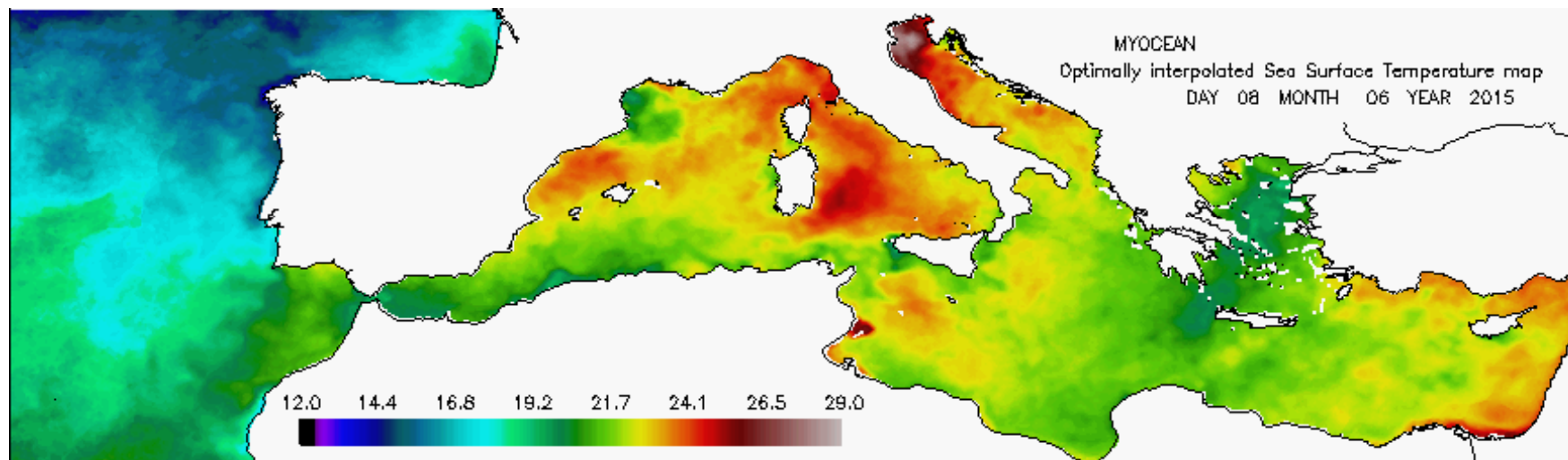
**REP: consistent re-processed time series** from 1997 to the 2012

**L3:** daily composite products; **L4** analysis (no data gaps), resolution: 1 km

**Parameters:** Chl, Rrs, water transparency, **IOPs, SPM**



## SST Products: multi sensors dataset



CMS Product No.	Product Description	MyOcean product name
P3	Mediterranean Sea High Resolution and Ultra High Resolution Sea Surface Temperature Analysis	SST_MED_SST_L4_NRT_OBSERVATIONS_010_004 (res: 5 km e 1 Km)
P5	Mediterranean Sea - High Resolution and Ultra High Resolution L3S Sea Surface Temperature	SST_MED_SST_L3S_NRT_OBSERVATIONS_010_012 (res: 5 km e 1 Km)
P7	Mediterranean Sea - High Resolution L4 Sea Surface Temperature Reprocessed (1981-2012) <b>update annually</b>	SST_MED_SST_L4_REP_OBSERVATIONS_010_021 (res: 5 km e <b>1 Km</b> )



# Mediterranean Sea Physics: 2 products

## 1. Analyses and Forecast

- 6 variables (Potential Temperature, Salinity, Currents, SSH, Stokes Drift Velocity, Wavenumber)
- Res:  $1/16^\circ$ , 72 vertical levels;
- Daily and hourly fields



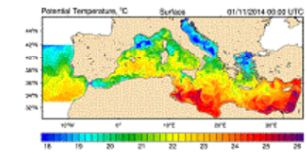
## MEDITERRANEAN SEA PHYSICS ANALYSIS AND FORECAST

Numerical-model, Temperature, Salinity, Currents, Sea-level, Near-real-time, Forecast, Mediterranean-sea

MEDSEA\_ANALYSIS\_FORECAST\_PHYS\_006\_001\_a

The physical component of the Mediterranean Forecasting System (Med-currents) is a coupled hydrodynamic-wave model implemented over the whole Mediterranean Basin. The model horizontal grid resolution is  $1/16^\circ$  (ca. 6-7 km) and has 72 unevenly spaced vertical levels.

The hydrodynamics are supplied by the Nucleus for European Modelling of the Ocean (NEMO) while the wave component is provided by WaveWatch-III. The model solutions are corrected by the variational assimilation (based on a 3DVAR scheme) of temperature and salinity vertical profiles and along track satellite Sea Level Anomaly observations.



MORE INFO 

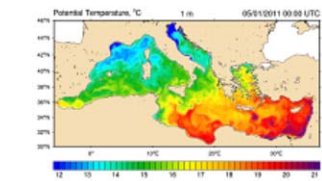
ADD TO CART 


## MEDITERRANEAN SEA PHYSICS REANALYSIS (1987-2013)


Numerical-model, Currents, Sea-level, Temperature, Salinity, Multi-year, Mediterranean-sea

MEDSEA\_REANALYSIS\_PHYS\_006\_004

The Mediterranean Forecasting System, physical reanalysis component, is a hydrodynamic model, supplied by the Nucleus for European Modelling of the Ocean (NEMO), with a variational data assimilation scheme (OceanVAR) for temperature and salinity vertical profiles and satellite Sea Level Anomaly along track data. The model horizontal grid resolution is  $1/16^\circ$  (ca. 6-7 km) and the unevenly spaced vertical levels are 72.



MORE INFO 

ADD TO CART 

# Mediterranean Sea Physics: 2 products

## 2. Reanalyses

- 4 variables (Potential Temperature, Salinity, Currents, SSH)
- Res:  $1/16^\circ$ , 72 vertical levels;
- Daily and Monthly means

## Mediterranean Sea Biogeochemistry:

- 2 products (analysis and forecast, reanalysis)
- 6 variables (chlorophyll, phytoplankton biomass, N and P nutrients, primary production, oxygen)
- Res: 1/16°, daily and monthly dataset

### SURFACE CHLOROPHYLL

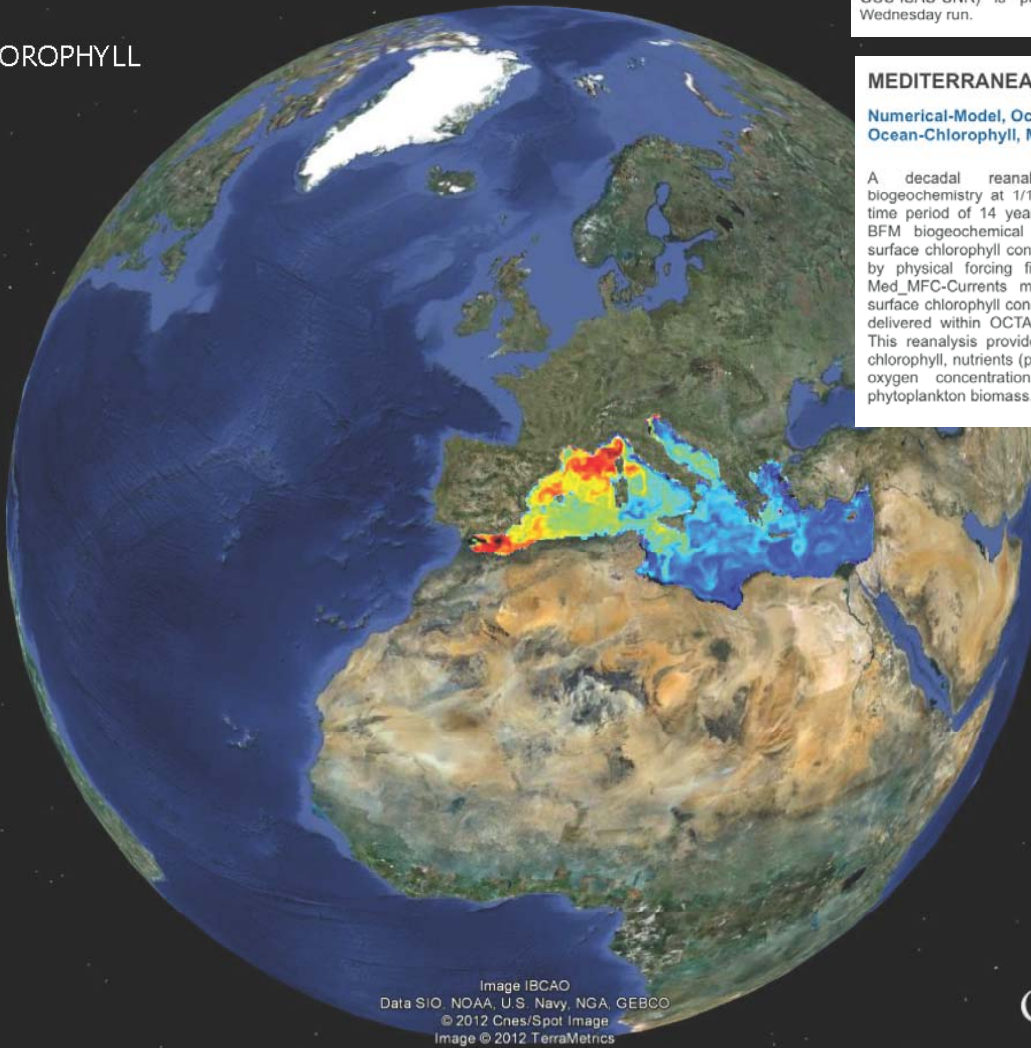


Image IBCAO  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
© 2012 Cnes/Spot Image  
Image © 2012 TerraMetrics

37°33'21.51" N 0°13'44.32" W elev 942 ft

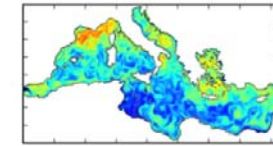
Google earth

Eye alt 6603.83 mi

### MEDITERRANEAN SEA BIOGEOCHEMISTRY ANALYSIS AND FORECAST

Numerical-Model, Ocean-Chemistry, Ocean-Chlorophyll, Ocean-Biology, Forecast, Near-Real-Time, Mediterranean-Sea

MEDSEA\_ANALYSIS\_FORECAST\_BIO\_006\_006



MORE INFO 

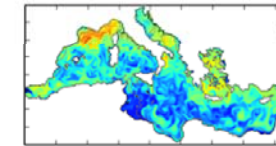
ADD TO CART 

The biogeochemical analysis and forecasts for the Mediterranean Sea are produced by the OGS Production Unit by means of the OPATM-BFM model system (described below), using as physical forcing the output of the Med-MFC-currents products managed by the INGV Production Unit. The forecasting system is automatically run at the CINECA supercomputing centre (Bologna, Italy). Seven days of analysis/hindcast and ten days of forecast are produced twice per week on Wednesday and on Saturday, and data assimilation of surface chlorophyll satellite observations (provided by the OCTAC managed by GOS-ISAC-CNR) is performed once a week in the Wednesday run.

### MEDITERRANEAN SEA BIOGEOCHEMISTRY REANALYSIS (1999-2012)

Numerical-Model, Ocean-Biology, Ocean-Chemistry, Ocean-Chlorophyll, Multi-Year, Mediterranean-Sea

MEDSEA\_REANALYSIS\_BIO\_006\_008



MORE INFO 

ADD TO CART 

A decadal reanalysis of Mediterranean Sea biogeochemistry at 1/16 degree was carried out along a time period of 14 years (1999-2012), using the OPATM-BFM biogeochemical model and data assimilation of surface chlorophyll concentration. OPATM-BFM was driven by physical forcing fields produced as output by the Med\_MFC-Currents model. The ESA-CCI database of surface chlorophyll concentration estimated by satellite and delivered within OCTAC was used for data assimilation. This reanalysis provides monthly means of 3D fields of chlorophyll, nutrients (phosphate and nitrate) and dissolved oxygen concentrations, net primary production and phytoplankton biomass.

# Possibili settori di applicazione



**Safety of navigation**



**Coastal protection and erosion**



**Search and Rescue**



**Pollution emergencies**



**Climate Change**



**Protection&management marine ecosystems**



**Off-shore activities**



**Military activities**



**Renewable energies**



**Fishery&acquacolture**



**Tourism**



**Harbours**

# IAMC CNR PRODUCTS @ SUBREGIONAL/LOCAL SCALE

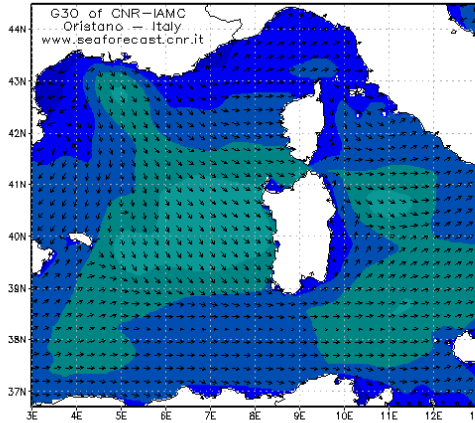


A daily 5-days forecast is produced & available @ [www.seaforecast.cnr.it](http://www.seaforecast.cnr.it)

Every day 3-hourly plots of Significant WH & WD and daily of T, S and current on 30 sigma levels

Data are used by ferries for the best route, during emergencies & international coordinated operations at sea, by local (Sardinian) stakeholders

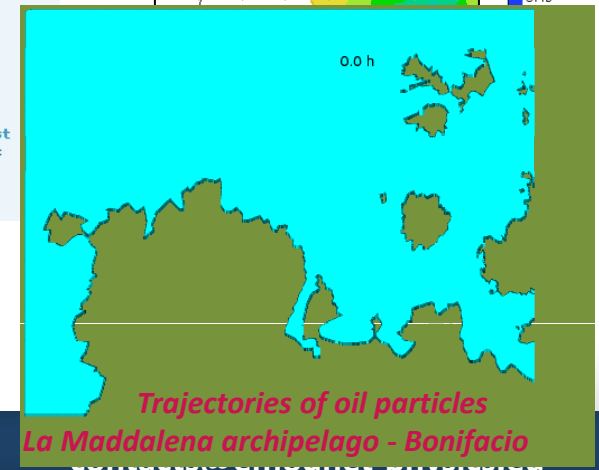
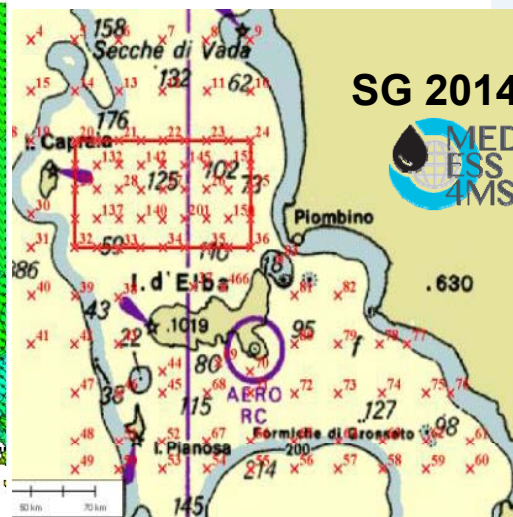
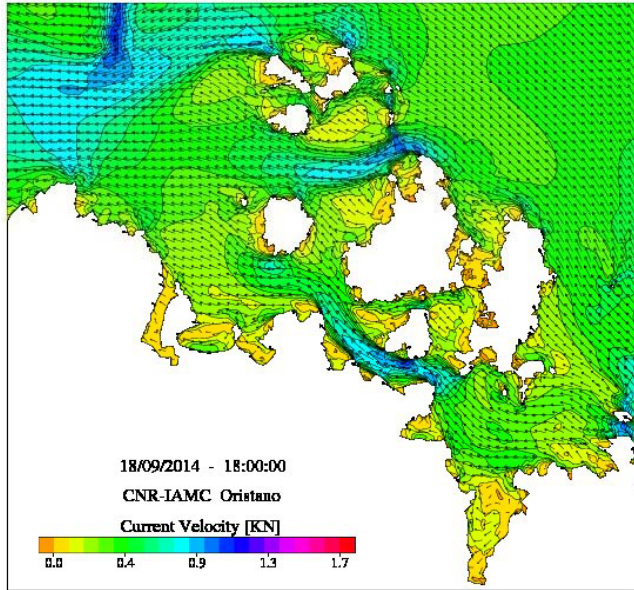
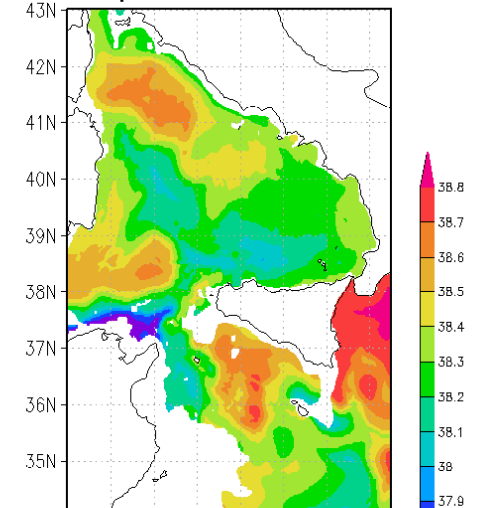
Significant Wave Height at 13.09.2014



Menu

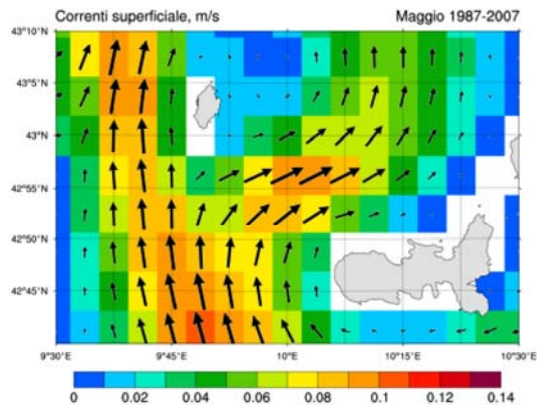
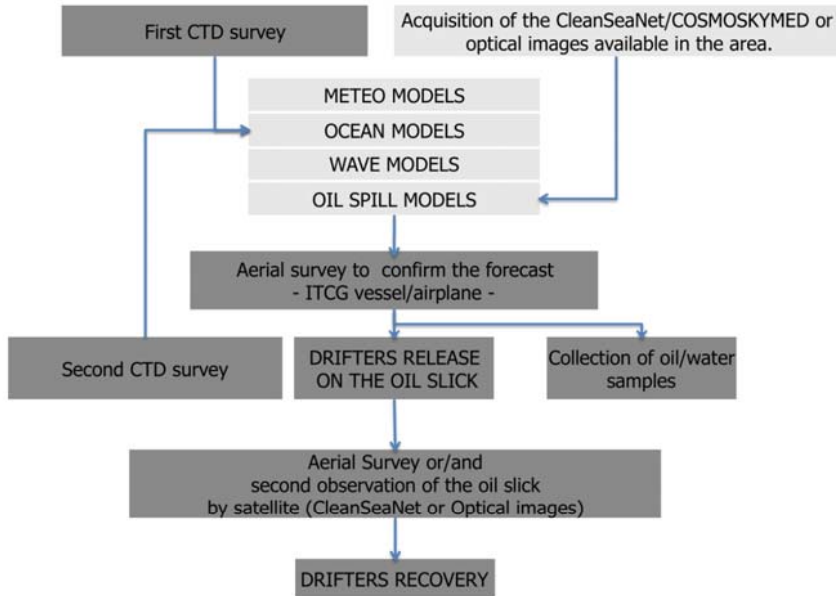
- Home Page
- Forecast
  - Western Mediterranean
    - Sardinian Seas
    - Ligurian Sea
    - North-Central Tyrrhenian Sea
    - Central Tyrrhenian Sea
    - Bonifacio Strait
    - La Maddalena Archipelago
  - Sicily Strait Region
- Analysis
  - Sicilian Seas
- Climatology
  - Monthly
  - Yearly
- Weather Forecast
  - Oristano Gulf
  - Bocche di Bonifacio

Salinity at 120m for 17.09.2014

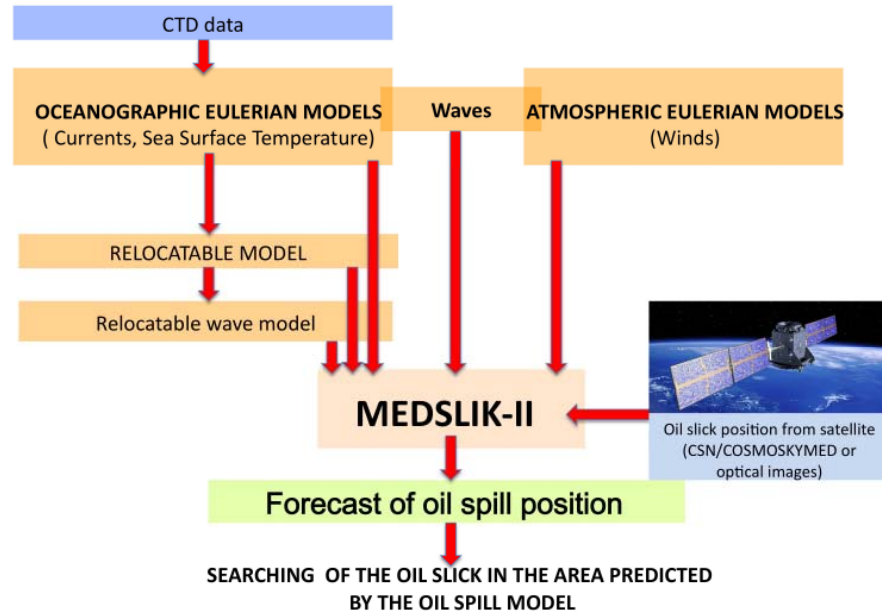




# Oil Spill response



GAM



# Downstream services from MyOcean: situational sea awareness services

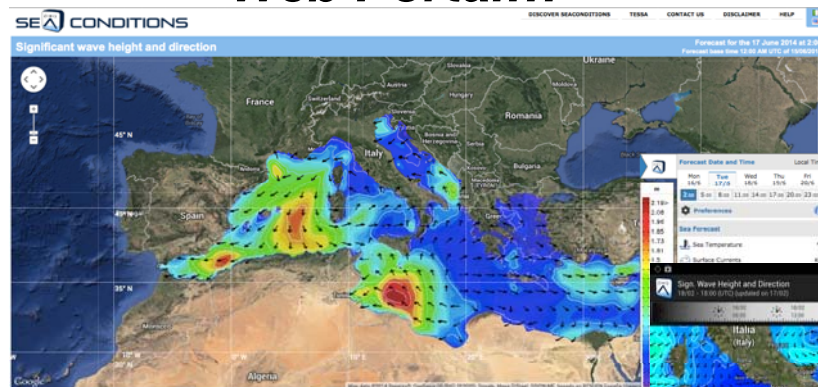
- TESSA Project: Situational Sea Awareness technology develops multi-channel services, customized for general public and special users



myOcean

Currents,  
waves and  
winds  
forecasted in  
the area

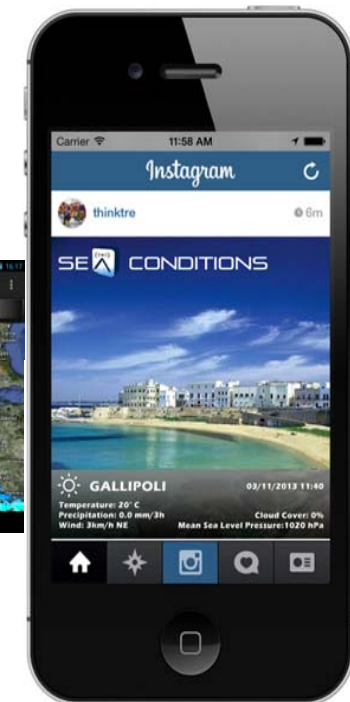
*Web Portal...*



*Tablet...*



*Smartphone...*



**Implied blue economy sectors :  
IT companies, transport, tourism**

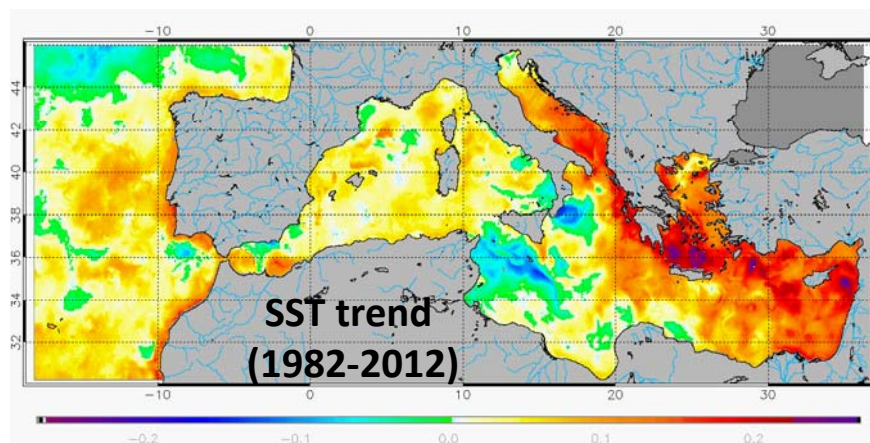
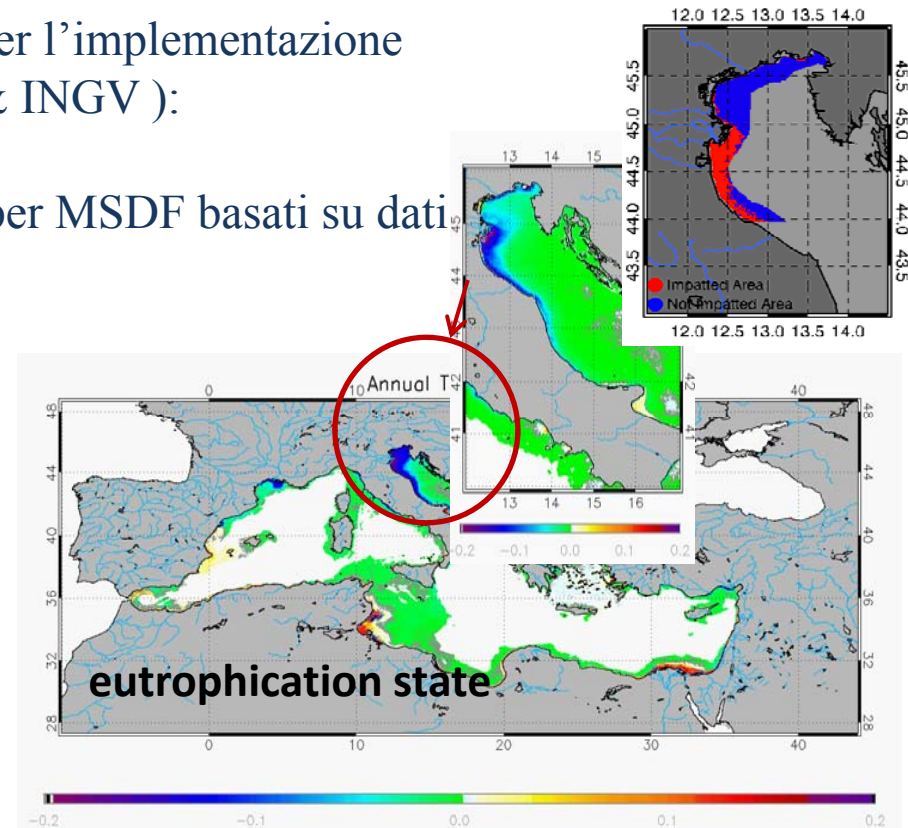
905

# MSFD: implementazione nazionale

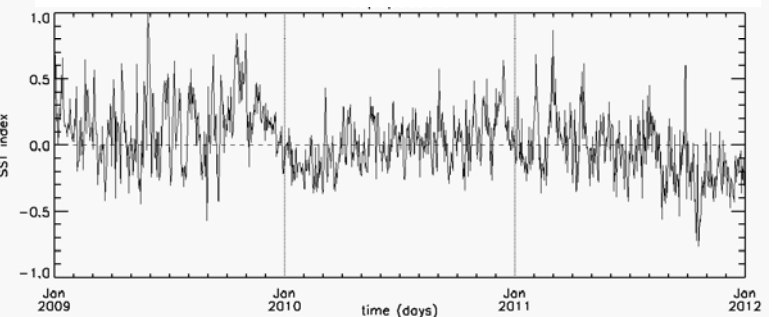
I Prodotti MyOcean sono stati usati per l'implementazione della MSFD (ISPRA & CNR-ISAC & INGV):

- Primo GES reporting Nazionale
- Sviluppo di indicatori ambientali per MSFD basati su dati da satellitari e output di Modelli

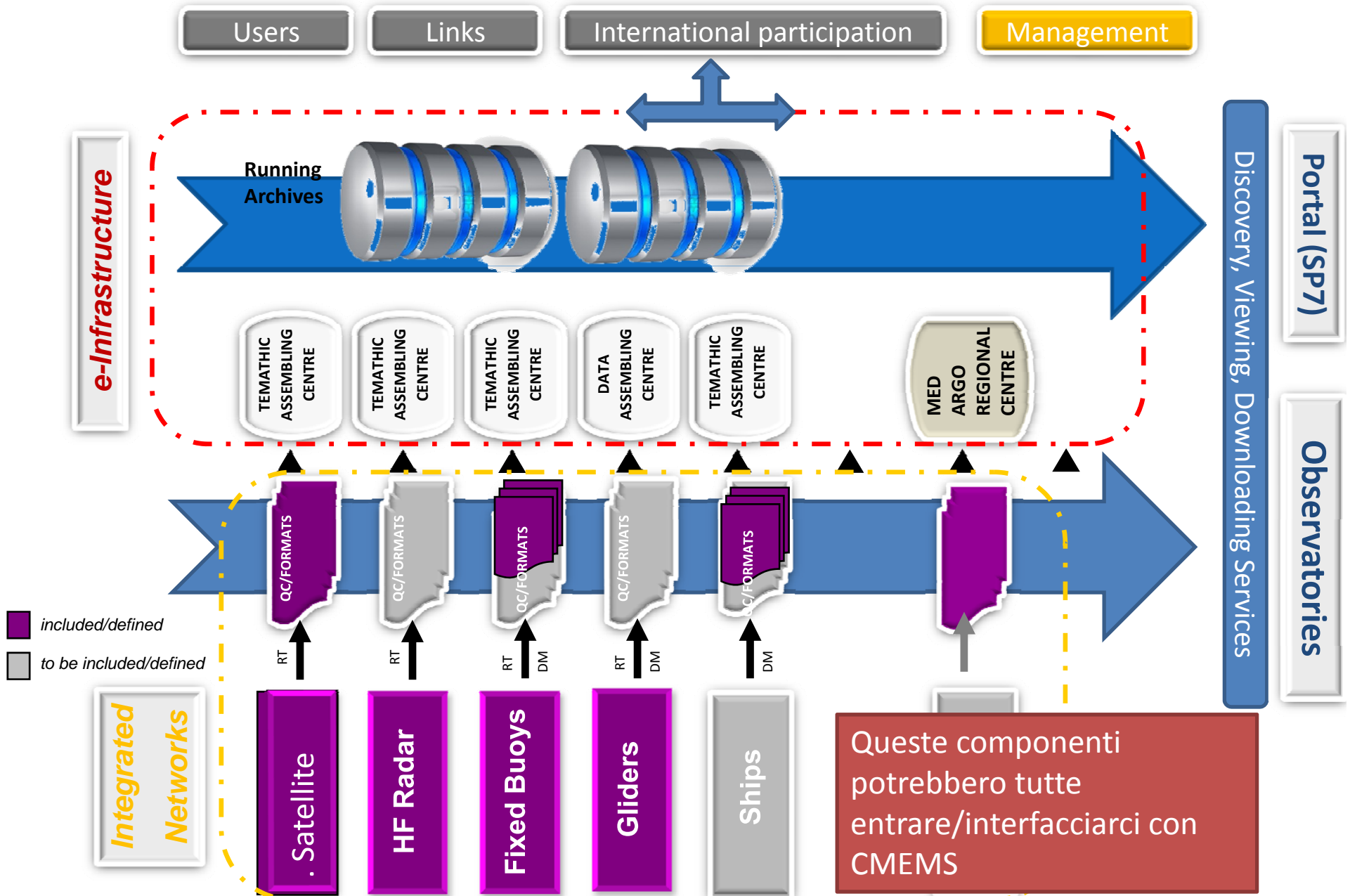
- *Upwelling index*
- *Chlorophyll trend*
- *Water Transparency trend*
- *SST Trend*
- *satellite based climatologies*
- *Chl P90*
- *Eutrophication impacted areas*



## Upwelling index Capopassero station

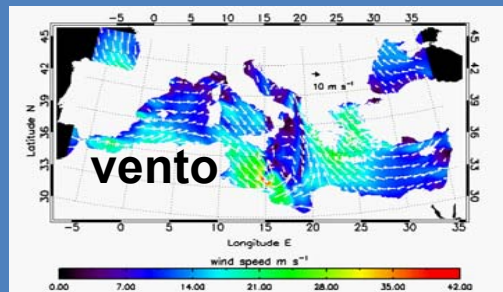
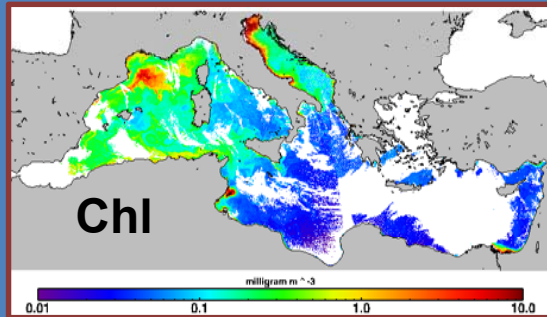
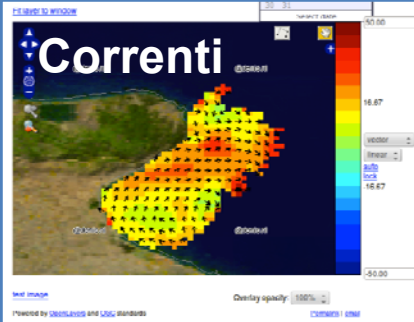
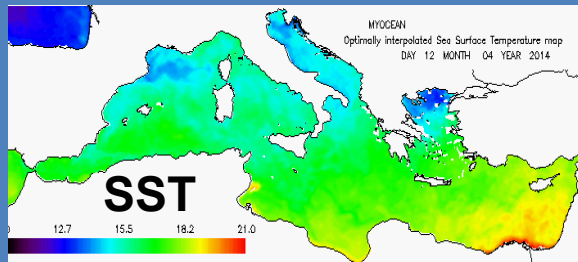


# Ritmare Observing System



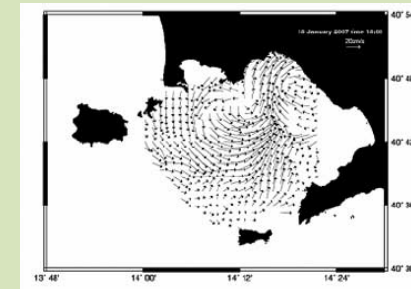


**Sistema Osservativo Mediterraneo e dei Mari Italiani : prodotti operativi ad Aprile 2014 (include prodotti CMEMS e RITMARE)**

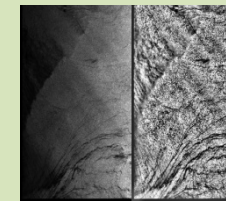


**Componenti da includere per test pre-operativo RITMARE**

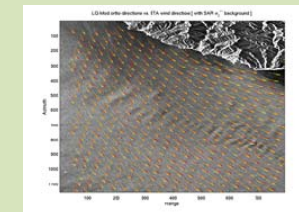
**Correnti (altri siti radar)**



**Onde**



**vento**



- SST oraria
- Correnti da satellite
- Altri parametri da dati OC: Trasparenza, TSM, CDOM, PSC...

NRT VAL e QC continuativo dei prodotti satellitari e da radar costieri



# Criticità

- **Qualità dei prodotti dipende fortemente dai dati in input:**
  - Acquisizione dei dati in situ non è garantita (GMES IN SITU & RI)
  - Qualità e continuità dei dati Sentinel missions e di altre missioni satellitari
  - Le attività di continuative di CAL/VAL space component non sono previste (SPACE Component & Inf Ric)
  - CMEMS REP utilizzano in input ESA CCI products -> Copernicus Climate service
- **Il mantenimento dei prodotti allo stato dell'arte dipende dalla ricerca che non è finanziata:**
  - sinergia con programmi Horizon 2020, DG Program, programmi nazionali
  - Programmi ricerca spaziale nazionali che preparino l'exploitation di dati Sentinel e permettano di mantenere e rafforzare la leadership italiana nel settore spazio



# Criticità

- **Lo sviluppo di servizi marini dipende dall'exploitation dei prodotti e dalla capacità dell'Italia di contribuire a definire il servizio marino:**
  - Sviluppo di programmi/progetti per lo sviluppo dei downstream services (blue growth)
  - Preparazione di una risposta italiana alla CMEMS call tender per user uptake
  - Incidere nella definizione dei requisiti del servizio e nella definizione dell'effort da dedicare sua ciascuna componente del sistema
  - Collaborazione tra ricerca-agenzie-impresa
  - Miglioramento della risoluzione spazio temporale dei prodotti per rispondere ai requisiti della sorveglianza e gestione dell'ambiente costiero (es. MSFD, MSP,...) e dello sviluppo dei servizi costieri (es: pesca, turismo costiero, ect )



**GRAZIE**