



Operational Ocean Colour data in the framework of the Marine Service

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EC FP7-SPACE: MyOcean2 "Prototype Operational Continuity for the GMES Ocean Monitoring and Forecasting Service"





GMES/Copernicus Marine Service

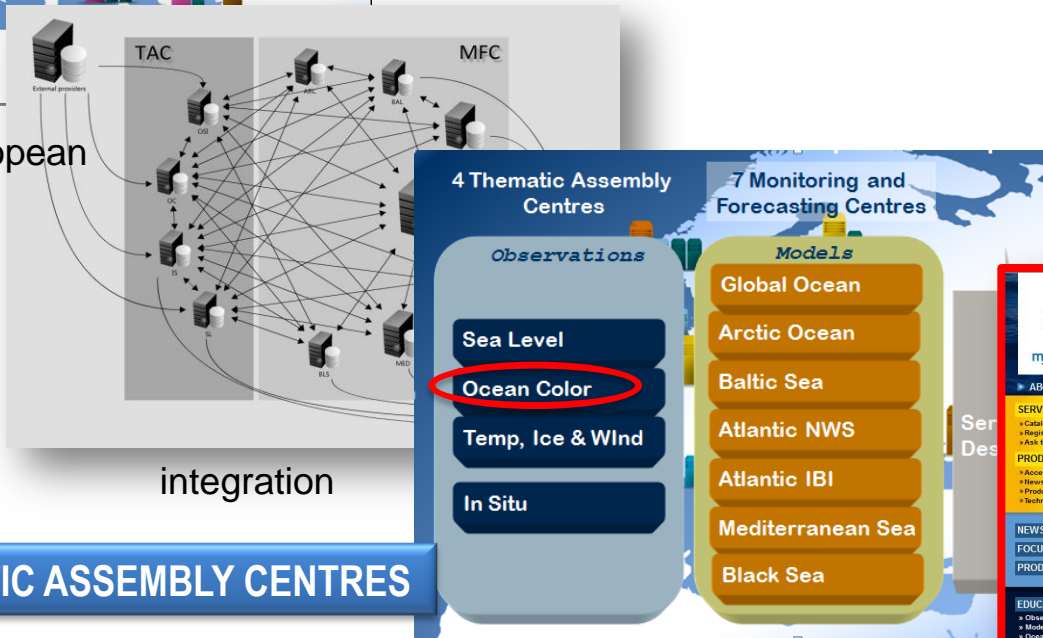


Objective: Develop and maintain an European service providing every day information on the physical and ecosystem state of the oceans and European regional seas

59 PARTNERS in FP7 MyOcean & MyOcean2 projects

14 MAIN OPERATORS for the main service functions

pan-european



integration

4 THEMATIC ASSEMBLY CENTRES

7 MONITORING AND FORECASTING CENTRES

production



Built on existing European Operational Centres

service





A core service for ocean monitoring and forecasting (www.myocean.eu)

PORTAL

OCEAN MONITORING and FORECASTING
Providing PRODUCTS and SERVICES for all marine applications.

USER CORNER

- ASK THE SERVICE DESK
- NEWS FLASH!
- ACCESS TO CATALOGUE
- REGISTER NOW!

Home » Products and services » Products » Access to catalogue

MYOCEAN INTERACTIVE CATALOGUE

Search mode: multi-criteria or full catalogue
Please note you have to register first before downloading MyOcean products.
» Service commitments & license

1 - AN AREA 2 - A PARAMETER 3 - A PRODUCT TYPE

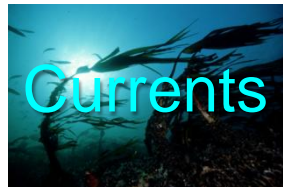
- Global Ocean
- Arctic Ocean
- Baltic Sea
- Atlantic-European North-West Shelf-Ocean
- Atlantic-Iberian-Biscay-Irish-Ocean
- Mediterranean Sea
- Black Sea

- Wind
- Biogeochemistry
- Currents
- Sea Ice
- Sea level
- Temperature
- Salinity

Observation
Analysis and Forecast

SEARCH

Download the latest MyOcean catalogue
Access full catalogue online



V3.0

MyOcean Catalogue of products

107 products

April 2013

Opencius



CORE SERVICE

DISCOVER

DOWNLOAD

VIEW

OPEN & FREE



REANALYSES
10 to 45 years

REAL-TIME
Daily, hourly

FORECAST
2 to 10 days



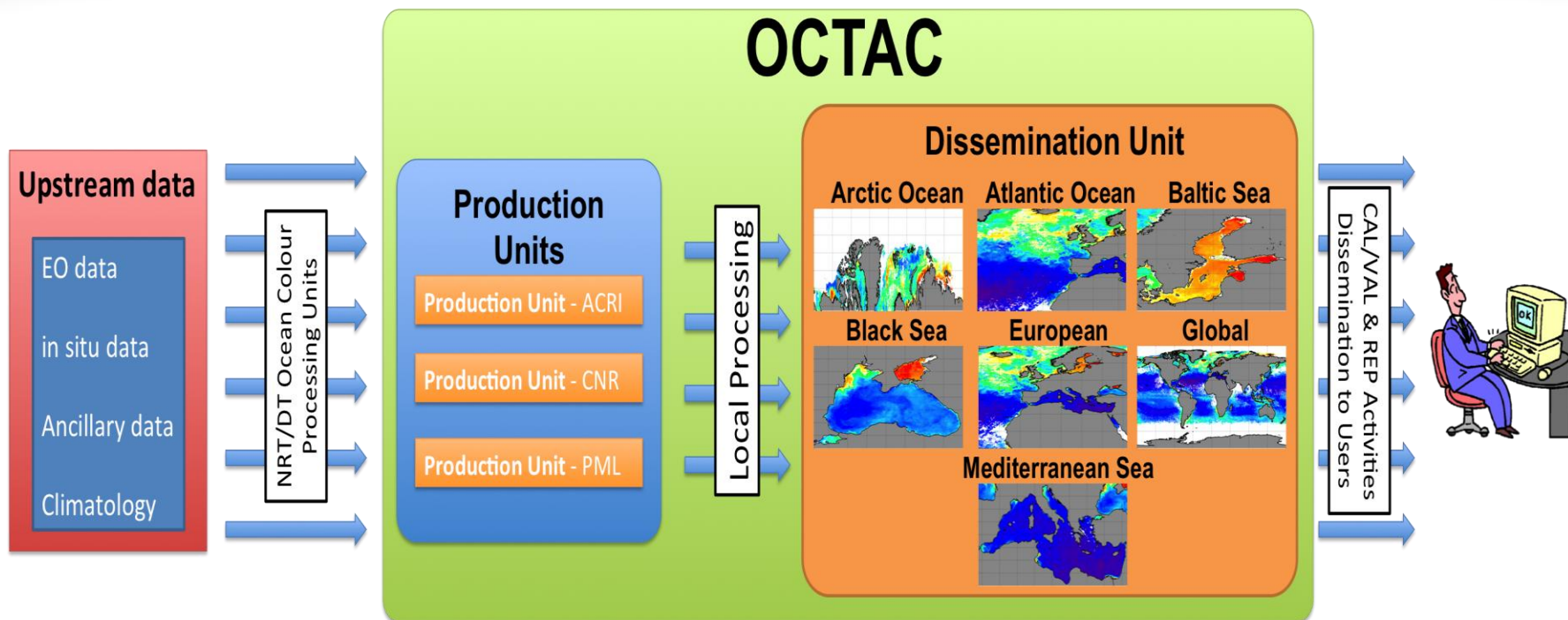
- To operate a European Ocean Colour Service for marine applications providing global and European regional high quality products
- To improve the Ocean colour products especially at the regional scale, for which quality of global products is typically lower
- To meet the strong demand for more accurate OC products in the coastal area via best Case I and Case II algorithm combination;
- To ensure high quality ocean colour core products and provide information on their quality

OCTAC converts satellite observations into data products that:

- support the MFCs with data required for assimilation and validation;
- provide useful observational data products to value-adding and end users

For MyOcean2, aim is to consolidate TAC production and service in a fully operational environment.

Designed as a distributed system built on existing European Operational Centres



OC-ACRI-PU: operating GLO, BAL and L4 Atlantic production chains

OC-CNR-PU: operating the MED and BS production chains

OC-PML-PU: operating the Atlantic and ARC L3 production chains

OC-CNR-DU: operating the OCTAC archiving and delivery system interfaced with MyOcean central system and OC service desk answering to user requests

Ifremer, HZG (MYO-2) & JRC (MYO-1) contributing to the R&D and CAL/VAL activities



OCTAC:Products

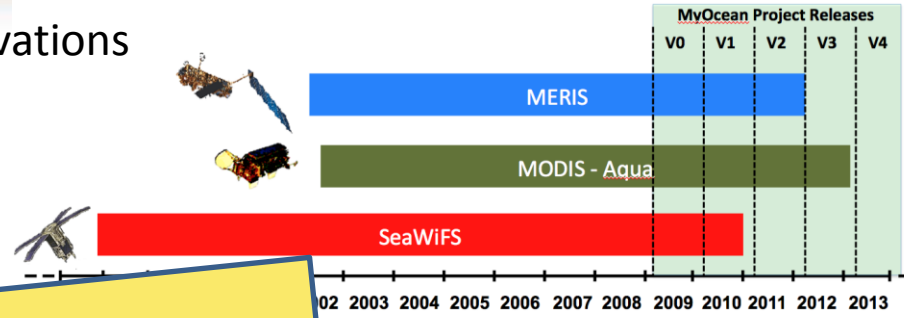
The entire OCTAC production relies on OC observations provided by space agency ground segments

OCTAC Baseline production:

- Non standard L2:** based on regional algorithms
- L3:** Rrs(λ), Kd(490), SPM, IOPs, chlorophyll-a
- L4:** DT, REP chlorophyll-a

- Specific products**
- NRT:** products
- DT:** consolidated
- REP:** consistent
- Single sensor**

State of the art Quality
 Product quality information available
 for all products



24 OC Products (100 datasets) are presently available in the MyOcean catalogue

Long-term, **routine and uninterrupted provision** of data is a pre-requisite for the service

At least from **three sensors** are required to produce **multi-sensor** products.

Since April 2012 OC NRT&DT products are based only on MODIS-A.

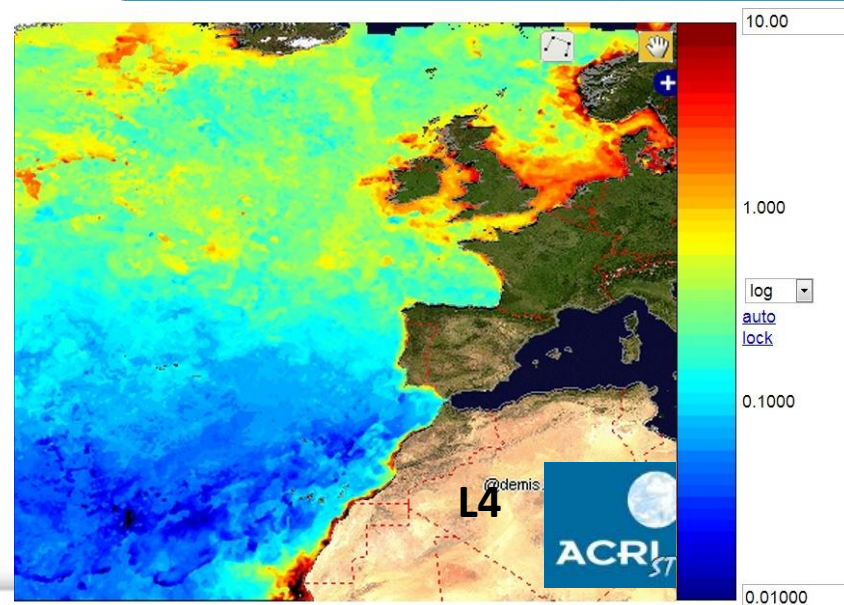
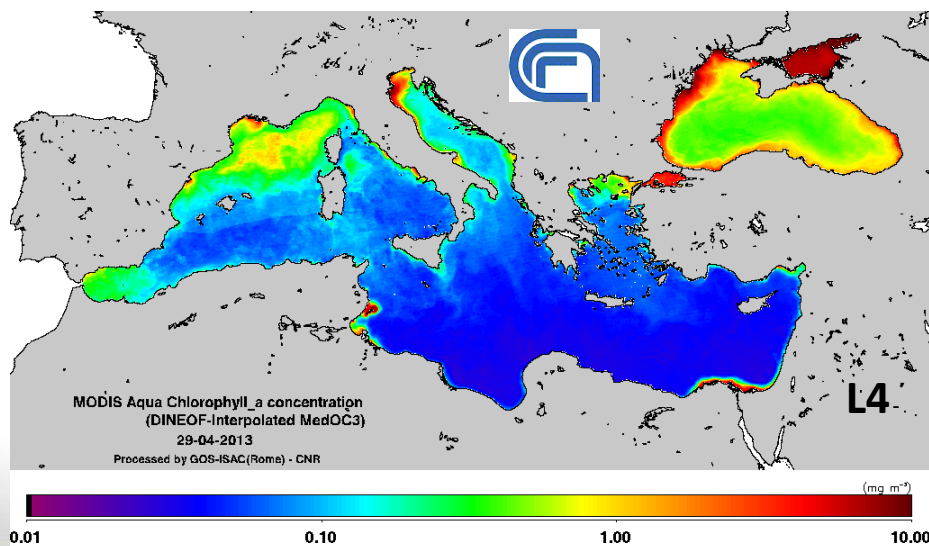
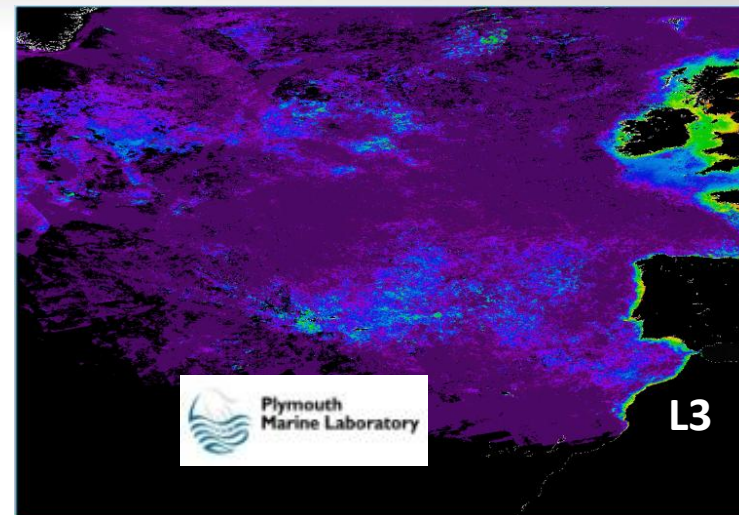
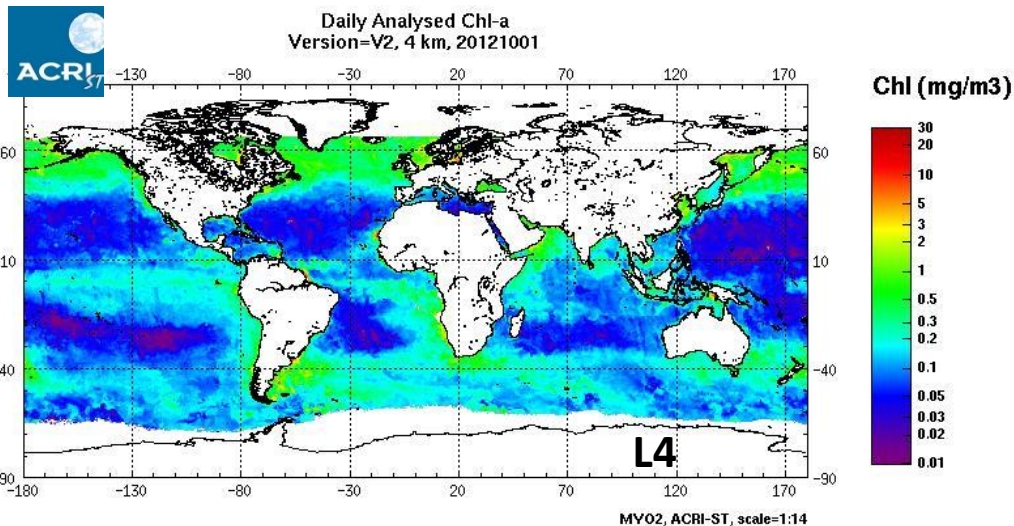
OCTAC ready to ingest MODIS-T. Evaluation of VIIRS data is started

Access to space agency products since the **early stage of the mission** is essential for OCTAC

The **operational system** requires **fast NRT data provision** and **dedicated interface** to access data from the space agency ground segments



New L3 & L4 OCTAC products (available from April 2013)



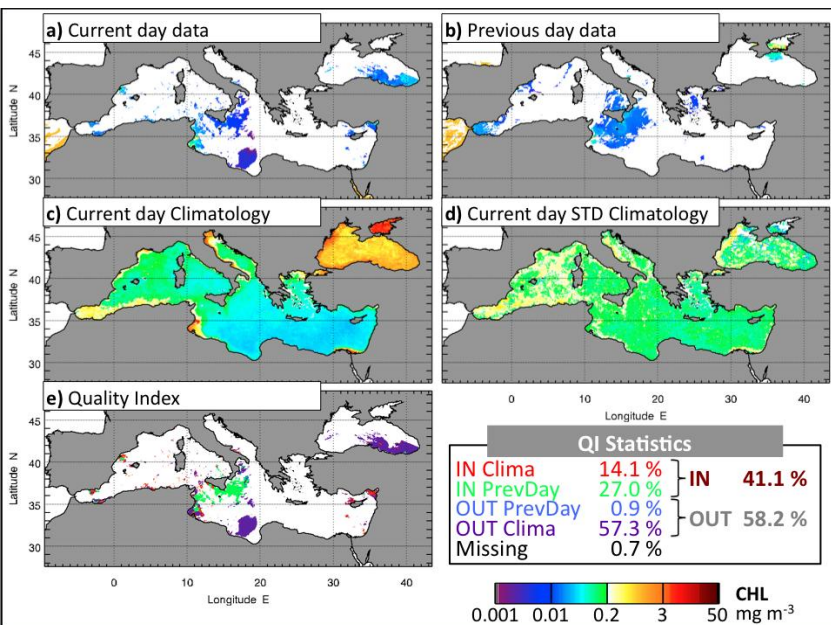
Data validation are routinely performed to assess the scientific accuracy of the OC TAC products:

1) offline validation:

- performed on each OCTAC product every time a significant change in the processing chain takes place
- Based on co-located in situ and satellite-derived measurements

2) daily online validation

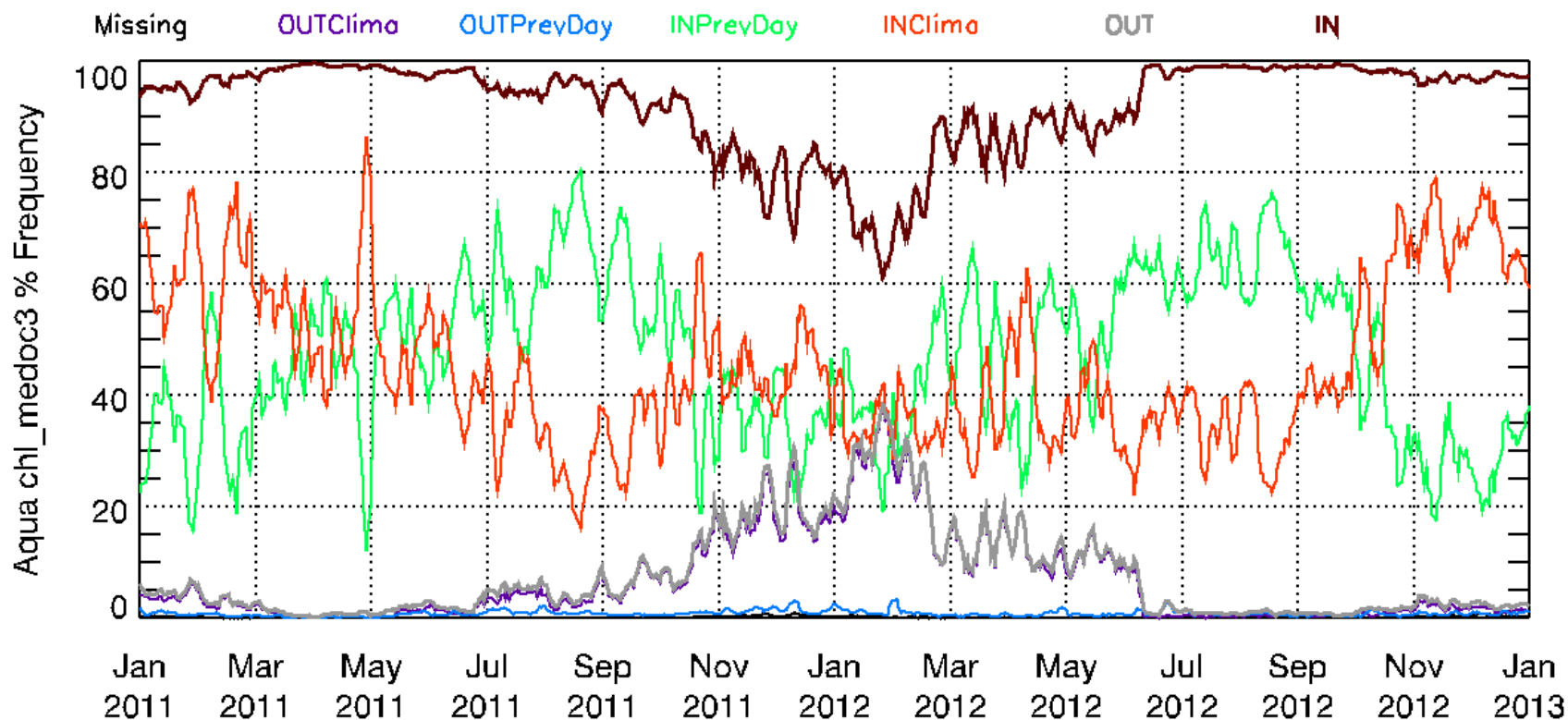
- aimed at assessing the degree of NRT data reliability based upon data time consistency
- Checking, on a pixel-by-pixel basis, consistency between the current and previous day data
- Temporal consistency against the current day climatology (from satellite data).



Example of the online validation analysis over the Mediterranean MODIS-Aqua CHL image (13th of December 2011)

No NRT in situ data are available for continuous online product validation

OCTAC Online Validation



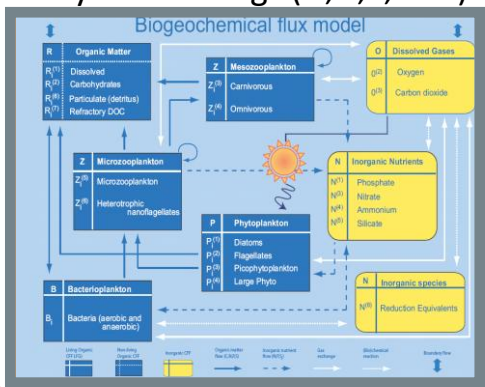
Online validation statistics time series for the 2011-2012 period, for MODIS Aqua L3 CHL MedOC3 product over MED & BS. Progressive degradation of the MODIS detected.

Volpe et al.: The Mediterranean Ocean Colour Observing System – system development and product validation. Ocean Sci., 8, 869-883, 2012

Use Of NRT OC data in MyOcean MFC: Mediterranean example (OGS)

BIOGEOCHEMICAL MODEL

OPA Tracer model + BFM
Physical forcings (U, T, i, etc.)



SATELLITE OBSERVATIONS

Chlorophyll concentrations
OC TAC (ISAC GOS CNR)

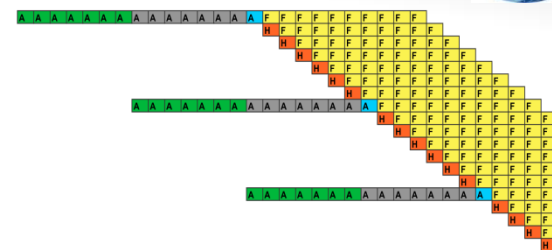
ASSIMILATION
3DVAR

ANALYSYS

Initial conditions for the forecast system

Forecast Cycle

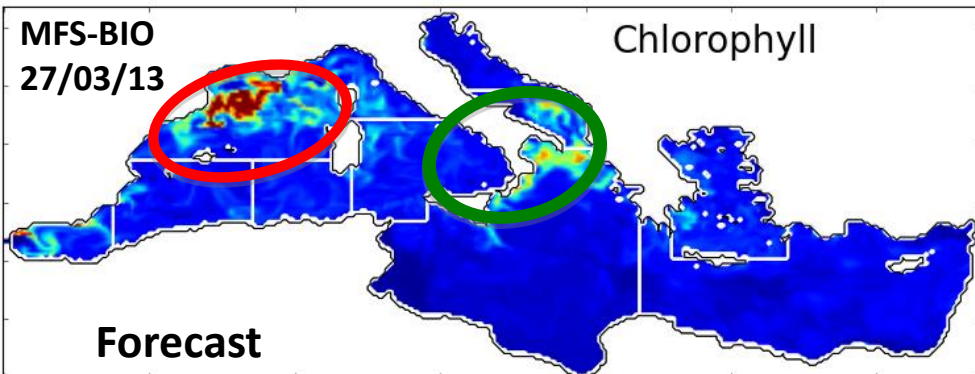
PRODUCTION WEEK DAY	FC Cycle Day
Tuesday	1 Tu
Wednesday	1 We
Thursday	1 Th
Friday	1 Fr
Saturday	1 Sa
Sunday	1 Su
Monday	1 Mo
Tuesday	2 Tu
Wednesday	2 We
Thursday	2 Th
Friday	2 Fr
Saturday	2 Sa
Sunday	2 Su
Monday	2 Mo
Tuesday	3 Tu
Wednesday	3 We
Thursday	3 Th
Friday	3 Fr
Saturday	3 Sa



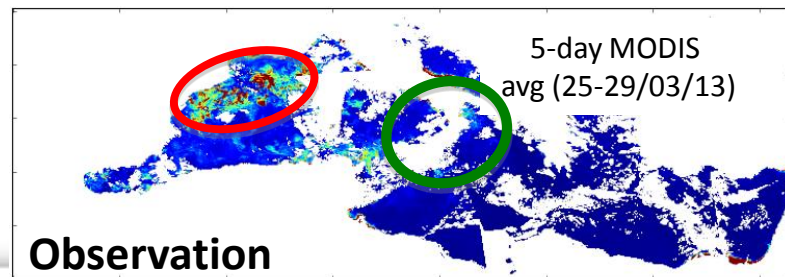
Once a week:

- Assimilation of previous 15-day available observations
- 10 days forecasts
- Operational Quality control of previous week forecast against OC observations

MFS-BIO
27/03/13



The system forecasted a bloom in the **North West Med** and in the **North-Ionian sea**.





Use of OC data in the MyOcean MFCs

MyOcean MFC	RT MFC BIO products (Analysis and/or Forecasts)						Multi-years MFS BIO products (hindcast or reanalysis)					
	Assimilation in BGC models			Validation of BGC forecasts			Assimilation in BGC models			Validation of BGC forecasts		
	V0	V2	V3	V0	V2	V3	V0	V2/V3	V4	V0	V3	V4
GLOBAL		O	O		O	X						X
ARTIC		O	O		O	X		X	X		X	X
BALTIC		O	O		O	O			X			X
NWS	O	O	O	O	O	X		O	X		X	X
IBI												X
Med	O	X	X	O	X	X		O	X		X	X
BS		X	X		X	X			X			X

O no use of OC data in assimilation and/or validation systems

X with OC data assimilation and/ or use of OC in the validation system

V0: April 2009;
 V2: April 2012
 V3: April 2013;
 V4: April 2014

Increasing use of OC data in MFC modelling assimilation and validation. High quality of OC data is crucial.



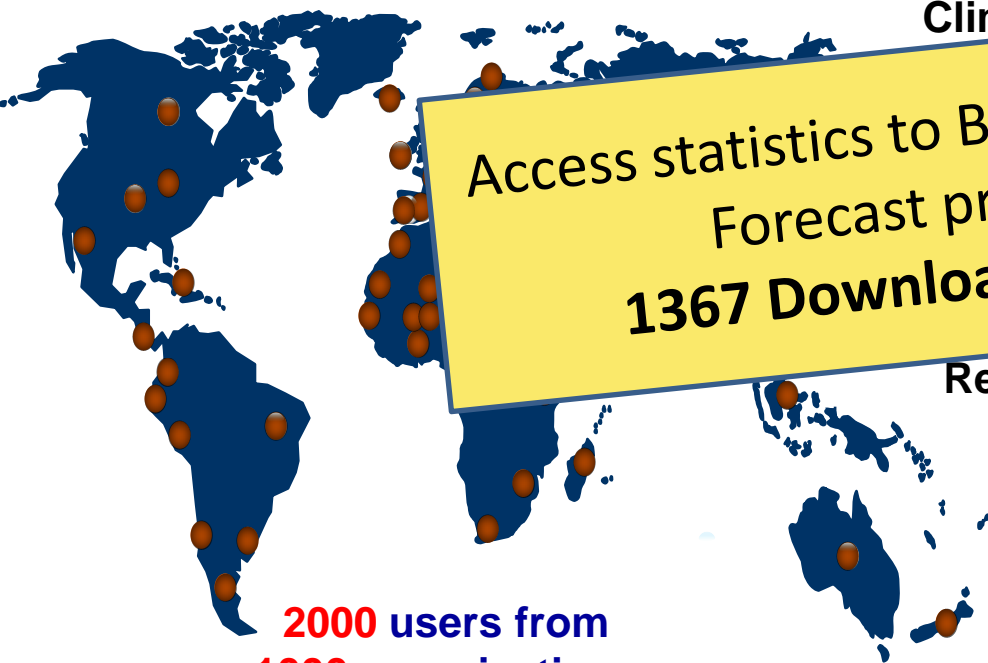
copernicus



MyOcean: an international and multi-sector response

Outcome of the last 12 months

Users in 88 different countries (26 EU members)



2000 users from 1000 organisations

Access statistics to BGC Analysis and Forecast products
1367 Downloads in 2012

31%

Climate seasonal

26%

Marine & coastal environment

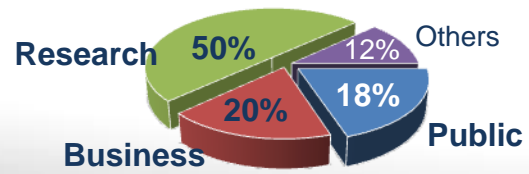
Marine safety

31%

Resources 12%

A well-balanced distribution across application areas

67% of users using the core service in more than one sector

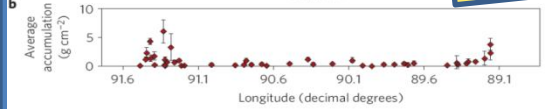
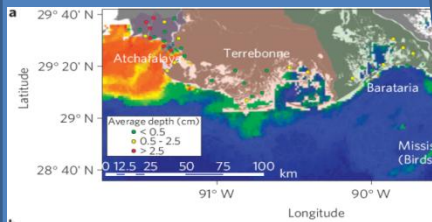


Satellite Marine Observations & Environmental problems

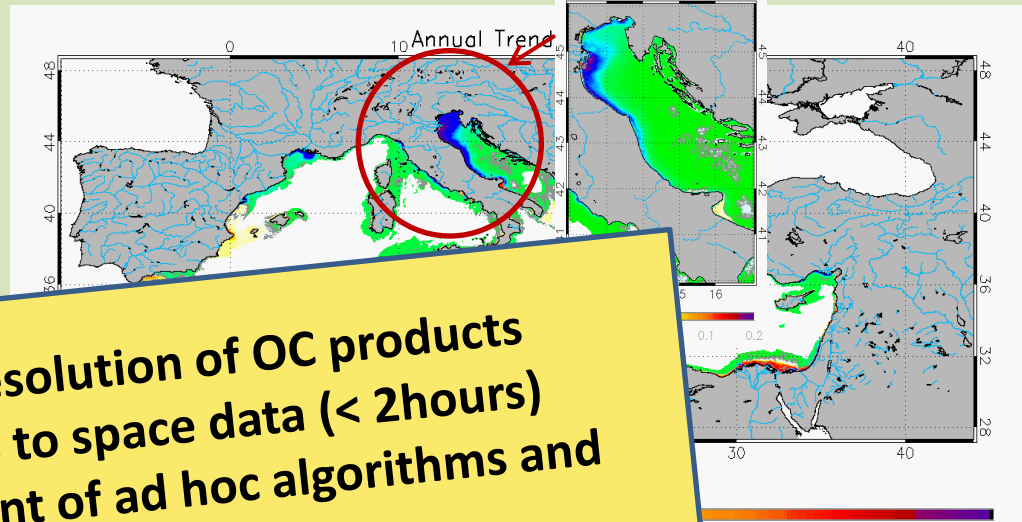


Coastal management

Satellite Spatial distribution of sediment load during the 2011 Mississippi river Flood

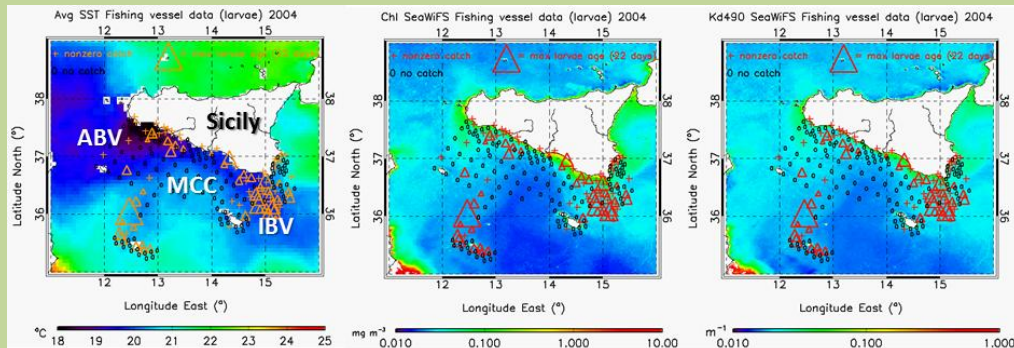


MSFD contribution: to assess the eutrophication state of the coastal Mediterranean Sea (yearly chlorophyll trends)



Higher resolution of OC products
RT access to space data (< 2hours)
Development of ad hoc algorithms and processing chains

Fishery management



OC spin monitoring system

