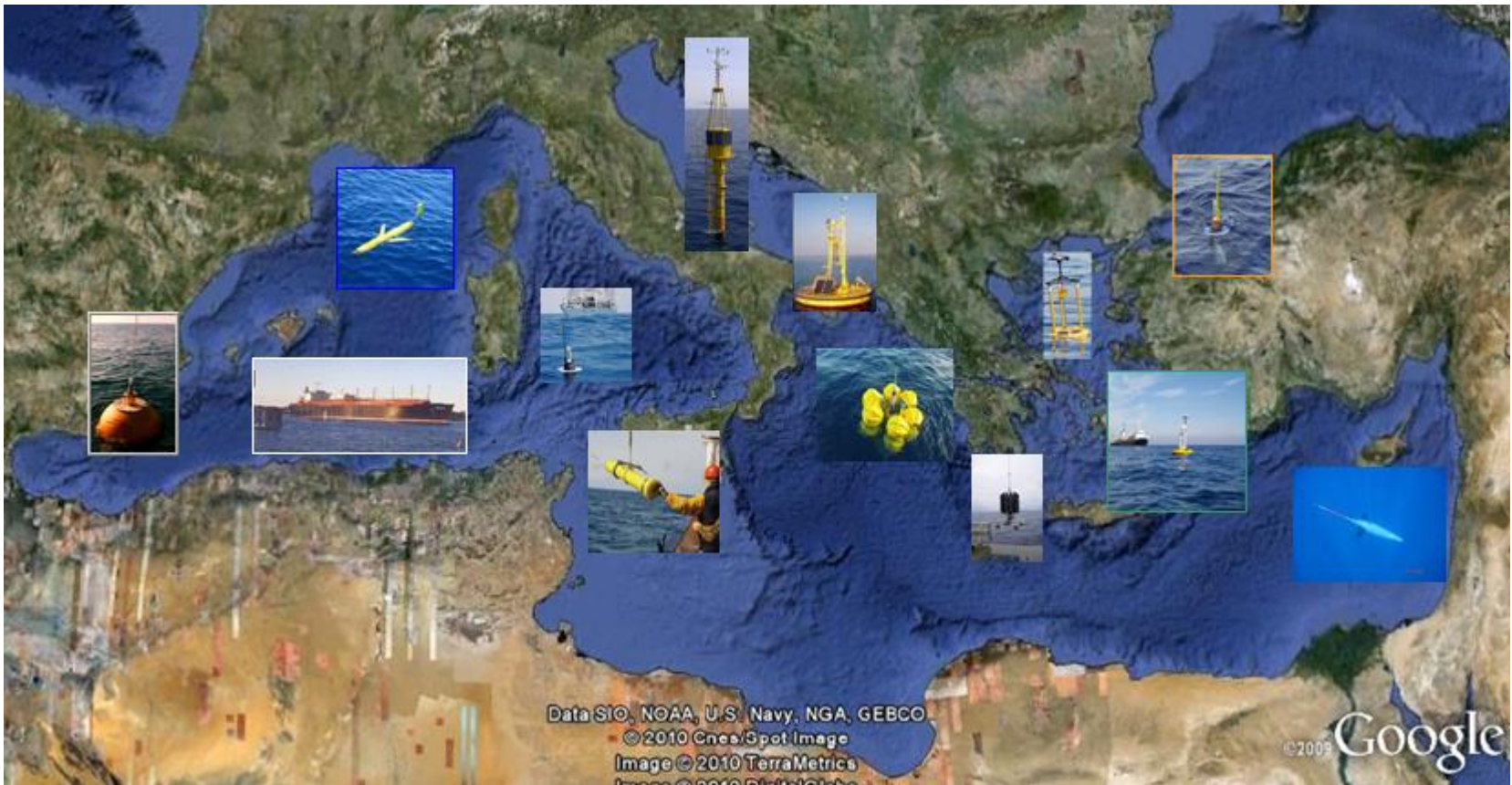


# The Mediterranean (MonGOOS) Data Center

## *SeadataNet 2, Third Plenary meeting, Split, 24-25 September 2014*



# Leonidas Perivoliotis

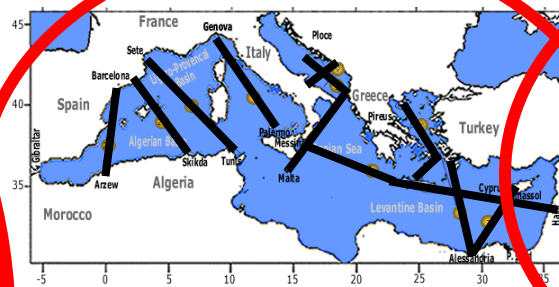
**Institute of Oceanography, Hellenic Center for Marine Research**



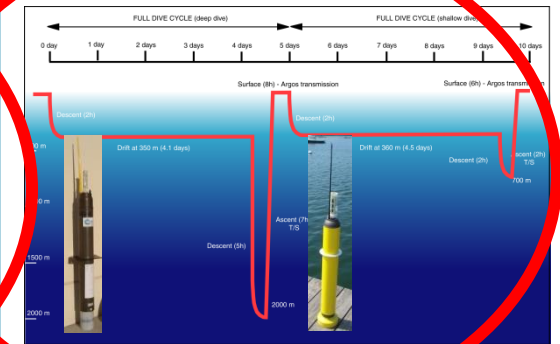
# Background on the data collection, processing and distribution in the Mediterranean: Platform-oriented data centers



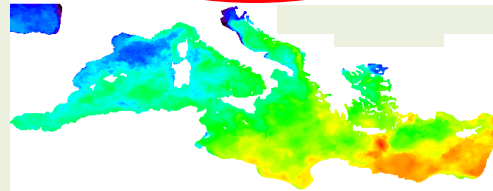
Multiparametric buoys in:  
Ligurian Sea, Adriatic Sea and  
Cretan Sea (few hours  
delay)



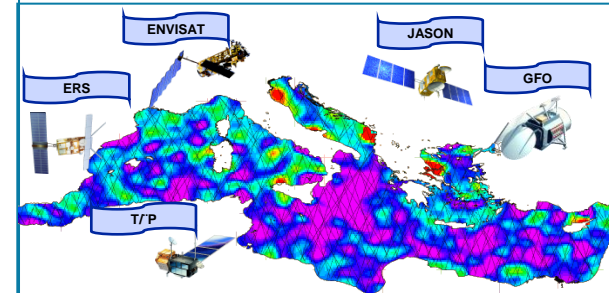
XBT VOS high resolution system (12  
nm along track and full profile  
transmission, few hours delay)



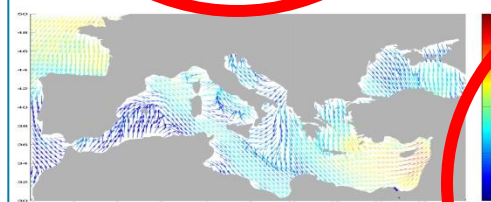
20 ARGO floats deployed from VOS  
(few hours delay)



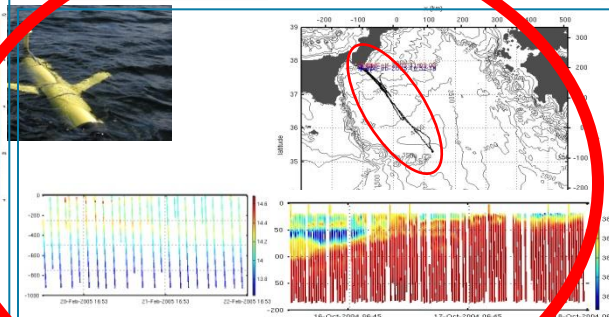
Daily satellite SST interpolated in RT on  
model grid (one day delay)



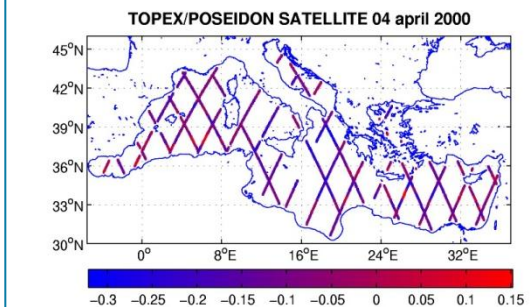
JASON-1, GFO, ENVISAT, T/P  
Sea Level Anomalies  
(few days delay)



Scatterometer DAILY winds  
analysis, 1/2x1/2  
(one week delay)



Open ocean monitoring by gliders  
(few hours delay)



# 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)
- Single point access for data provision to Med Marine Forecasting Center (MFC)
- 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).
- Continuously expanded in terms of capacity in order to gather all the available data from the insitu platforms in the Med.





# Insitu Thematic Assembly Centers (TACs): A regional organization

**North West Shelves: BSH/Germany**

- Temp & Salinity : BSH/Germany
- Current: SMHI/Sweden
- Sea Level: DMI/Denmark

**Arctic: IMR / Norway**  
all data

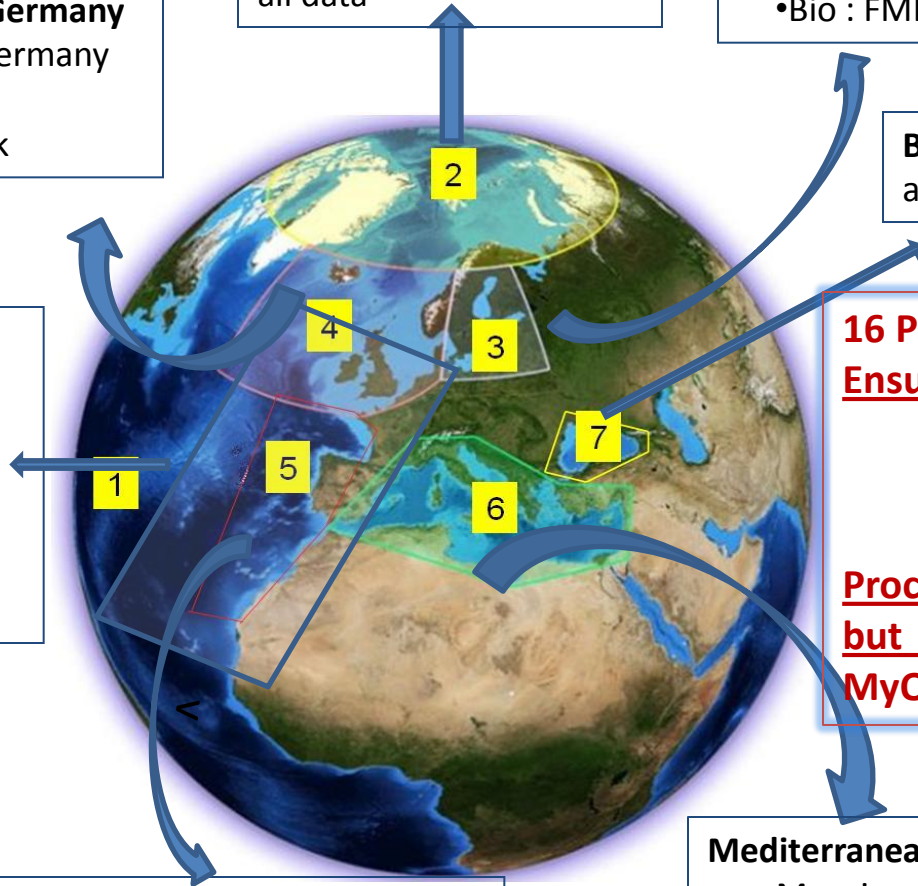
**Baltic Sea: SMHI/Sweden**

- Temp & Salinity : BSH/Germany
- Current: SMHI/Sweden
- Sea Level: DMI/Denmark
- Bio : FMI-Syke/Finland

**Black Sea IOBAS/Bulgaria**  
all data

**Global Ocean : Coriolis/France**

- Link with international network s: Coriolis/France
- ARGO: Coriolis,BODC,BSH
- European Vessels: NIVA/Norway



**16 Partners/ 11 countries**  
Ensure the link with :

- International networks
- EuroGOOS ROOSes
- SeaDataNet

Process data in a common but distributed manner for MyO & ROOSes needs

**Mediterranean Sea : HCMR/Greece**

- Mooring : HCMR/Greece
- XBT/CTD: ENEA/Italy
- Drifter & Argo: OGS/Italy
- Glider and Argo: Coriolis/France

**South West Shelves: Puertos Del Estado/Spain**

- Mooring : PdE
- Underway data: Coriolis/France



**Infrastructure built on EuroGOOS strategy and supported through MyOcean I&II projects**

# The core tasks for the Insitu TACs

Define common distribution means:  
vocabularies, formats, organization, monitoring tools,...

Build a reliable distributed architecture for in-situ data delivery  
to Marine Forecasting Centers (MFCs) and to the users

Converge on common quality control procedures and flag  
conventions

- Enhance the T&S basin scale consistency methods for global ocean and adapt them to regional scales, if possible
- Develop methods for Quality Control of biogeochemical data both in real time and delayed mode and provide recommendations for acquisition of biogeochemical data from various platforms

Turn into operation enhanced calibration/validation methods

# The Role of Mediterranean Insitu TAC

## Number of parameters:

- Physical: T&S, current, sea level
- Biogeochemical: Chlorophyll/Fluorescence, Oxygen, Nutrients
- Atmospheric: Air Temperature, Wind, Air Pressure
- Sea State: Waves (Significant Height, Direction, Period)
- Any additional parameters that may be available (radiation, sound data, etc.)

Required by MyOcean

## Integrate in-situ data in product accessible through global and regional portals

- Common format
- Common NRT QC
- Common Quality flags
- Common distribution tools
- Single access point

## Ensure a minimum level of quality on the data delivered

- In Near real time ( 24h to a week)
- In delayed mode

## Assessment of the products at basin scale

# The Insitu TAC relies on close collaboration with:

**EuroGOOS** – Coordination of the observing networks in European scale

**JCOMM** - Coordination of the international observing networks

**SeaDataNet** which consolidates the NODC network and provides delayed mode products

# The Mediterranean Data Center

## Data acquisition

### Main steps:

- Direct connection is established (usually through ftp protocol) between the Med portal and the data provider
- Information is provided about the required metadata that should be supplied together with data (*ex. station position, date, frequency of measurement, platform name, depth of each sensor, contact person, PI, etc.*)
- Guidance is also provided on how the required daily and monthly files should be created.
- Information exchanged about the QC procedures
- Data are provided in the originator's native format, **no need for conversion to NetCDF**. This procedure is performed by the IT staff of Med Data Center.



# The Mediterranean Data Center

Real Time QC Function :

Quality Control procedures are applied in:

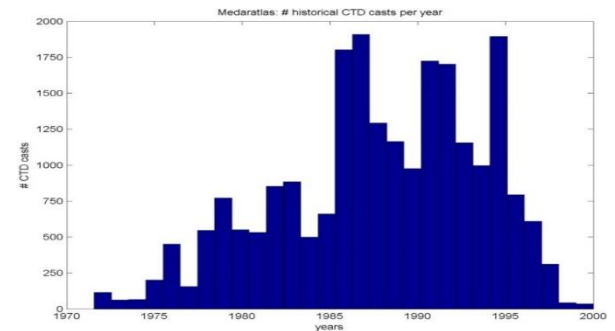
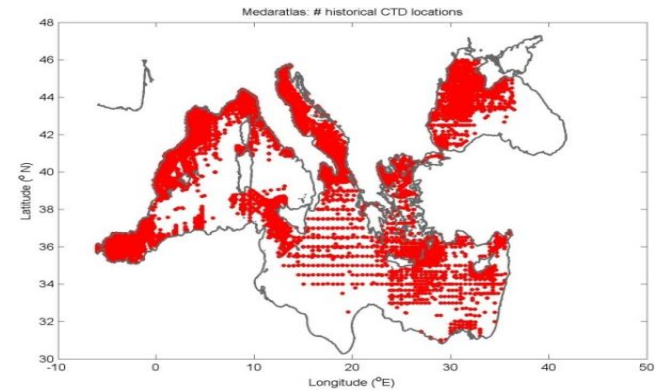
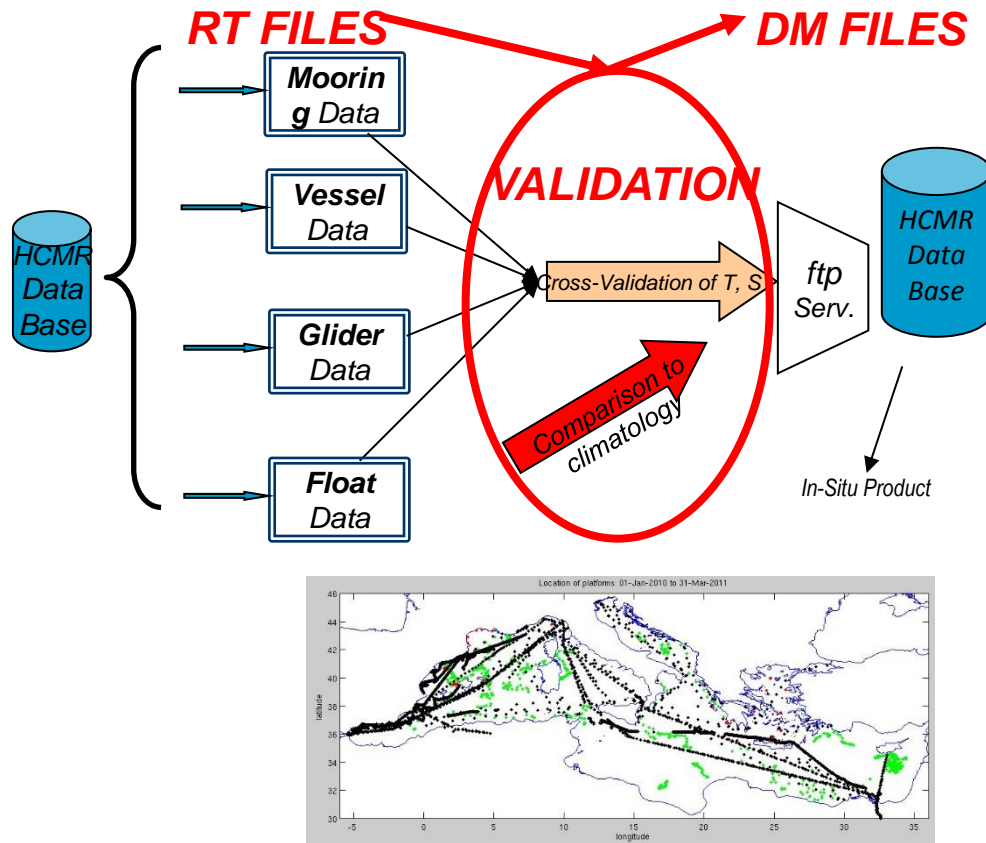
- Temperature and Salinity
- Sea Level
- Current from drifters or Current from moorings
- *Bio-geochemical (Still under development)*

## *Implementation*

- automated procedure that should avoid flagging good data
- applied through an agreement with the primary Production Unit
- In most cases minor corrections are applied to the flags that have already been assigned by the Production Unit

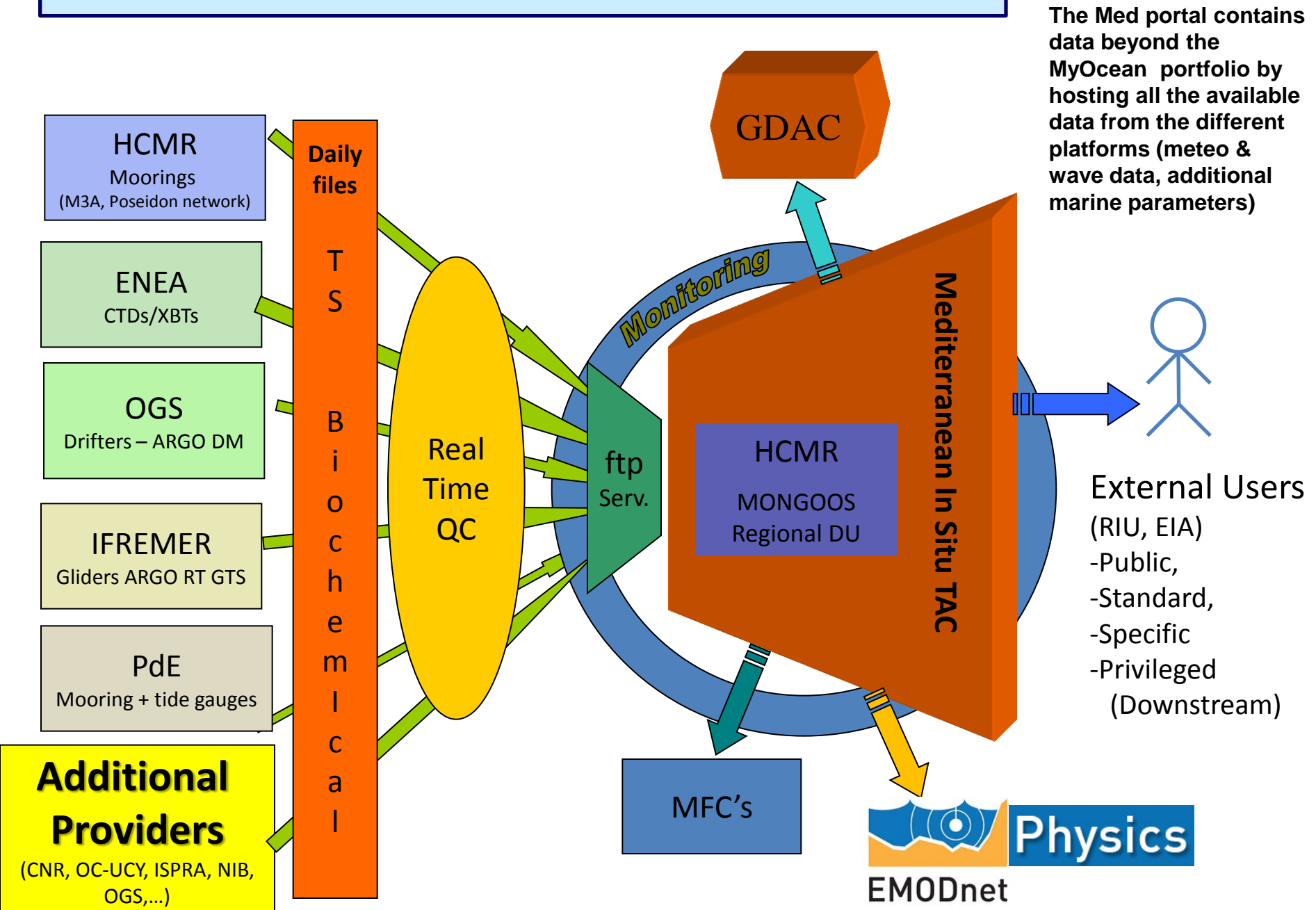
# The Mediterranean Data Center

## *Validation/ Assessment for Temperature and Salinity data*



Assess the consistency of the data over a period of time in an area. The aim is to detect possible incoherencies with nearby data that could not be detected by automatic QC.

# The Mediterranean Data Center – Production line



# The Mediterranean Data Center

*Data availability on 22nd of September 2014 (1990-now)*



198 profilers  
56 active



31 Gliders  
3 active



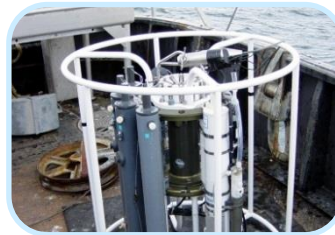
78 moorings  
52 active



1295 drifters  
15 active



184 XBTs  
3 active



122 CTDs



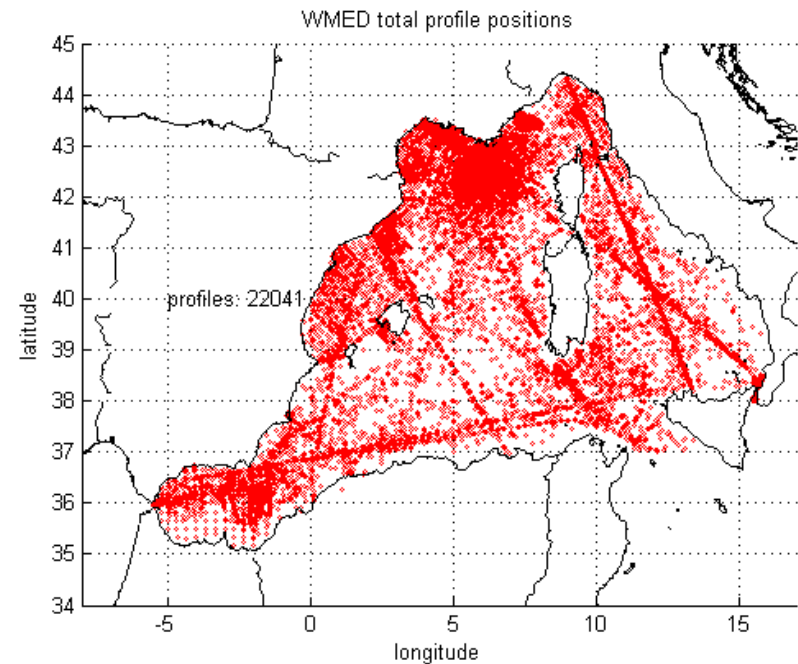
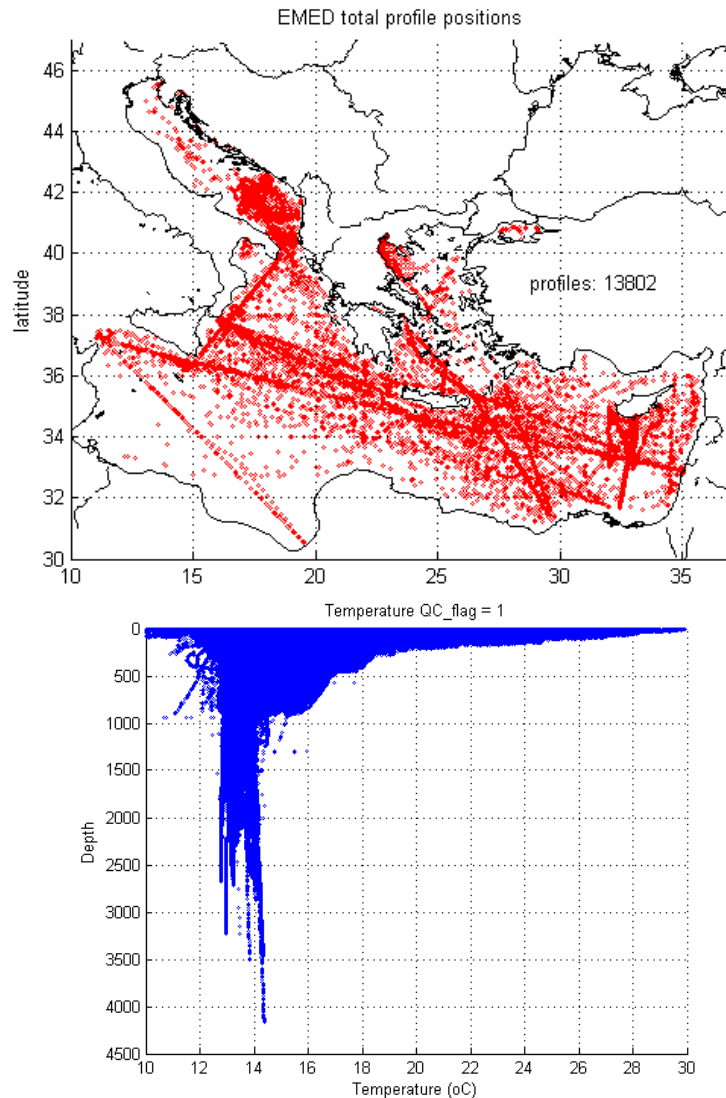
146 Thermosalinographs  
7 active

**2054 unique platforms**

**34214 total files**

# The Mediterranean Data Center

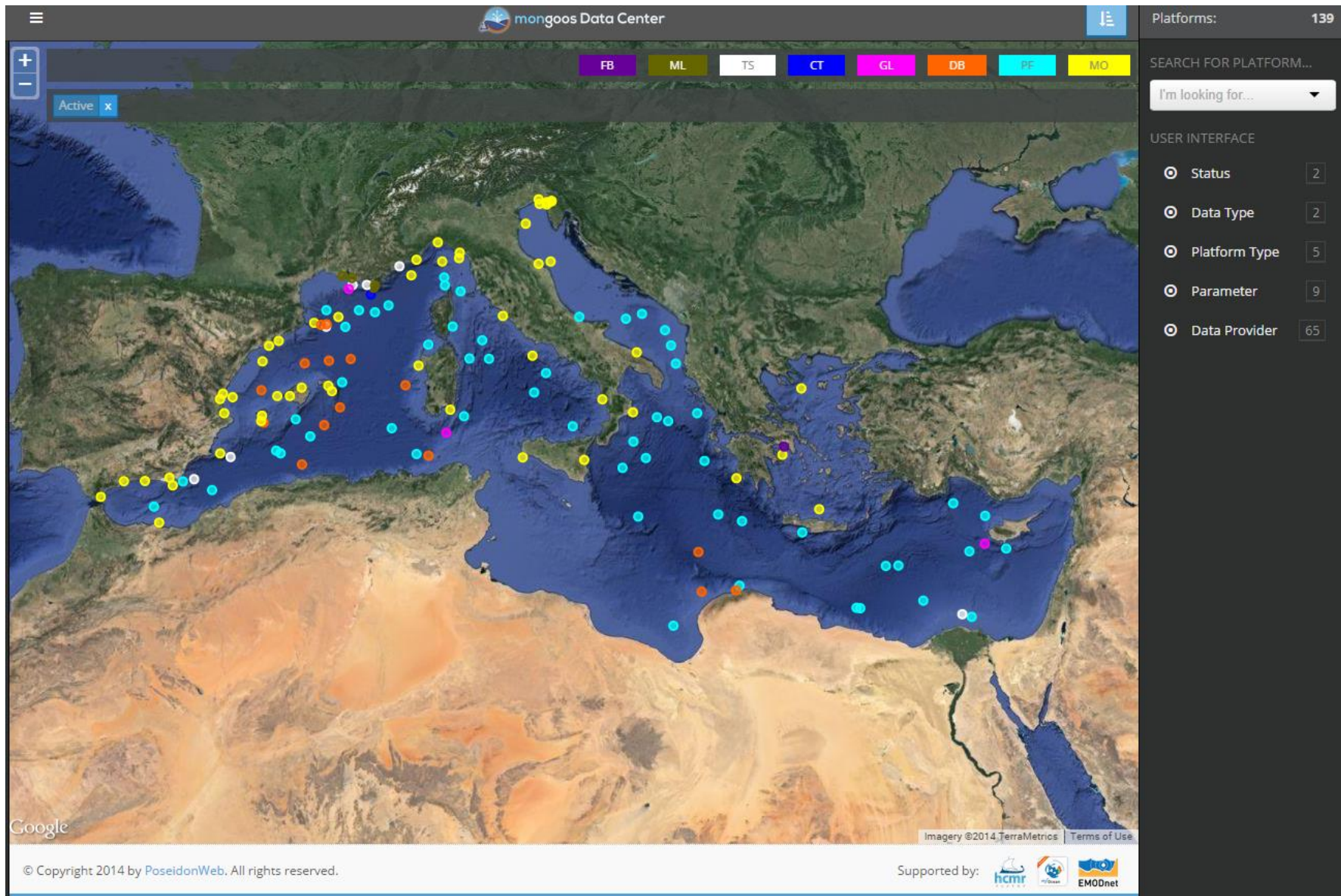
## *Data aggregation from SeaDataNet*



***1600 cruises (1990-2012) from  
SeaDataNet : 35332 T&S casts  
Assessment of historical data set***



# The Mediterranean Data Center has its own web portal now



Data availability on 22/9/2014 – 139 active platforms

# The Mediterranean Data Center

## Platform Information

### Institution

Consiglio Nazionale delle Ricerche - Istituto di Studi sui Sistemi Intelligenti per l'Automazione ( CNR-ISSIA ) - Italy

### Platform code / WMO platform code

Platform Code: W1M3A  
WMO platform code: N/A

### PI name

Roberto Bozzano (roberto.bozzano@cnr.it)

### Author / Contact

Author: Sara Pensieri (sara.pensieri@ge.issia.cnr.it), Med ROOS data center (HCMR)  
Contact: Roberto Bozzano (roberto.bozzano@cnr.it), myocean-service@ath.hcmr.gr

### First Transmission Date - Last Transmission Date (UTC)

2013-09-01 00:00:00 - 2014-09-20 18:00:00

### Location of Latest Transmission

Latitude: 43.8264 - Longitude: 9.1117

## Available Parameters

### Atmospheric

ATMS: atmospheric pressure at sea level ( hectopascal )  
DRYT: air temperature in dry bulb ( degree\_Celsius )  
GSPD: gust wind speed ( meters/second )  
LINC: long-wave incoming radiation ( watt/m2 )  
PRRT: hourly precipitation rate ( millimeter/hour )  
RDIN: incident radiation ( W/m^2 )  
RELH: Relative humidity ( % )  
WDIR: wind from direction relative true north ( degree )  
WSPD: horizontal wind speed ( meters/second )

### Sea-Temperature

TEMP: sea temperature ( degree\_Celsius )

### Salinity-Conductivity

PSAL: practical salinity ( psu )

### Waves

VAVH: AVER. HEIGHT HIGHEST 1/3 WAVE ( meter )  
VDIR: wave direction rel. true north ( degree )

### Sea-Level

PRES: sea pressure ( decibar )

### Optical

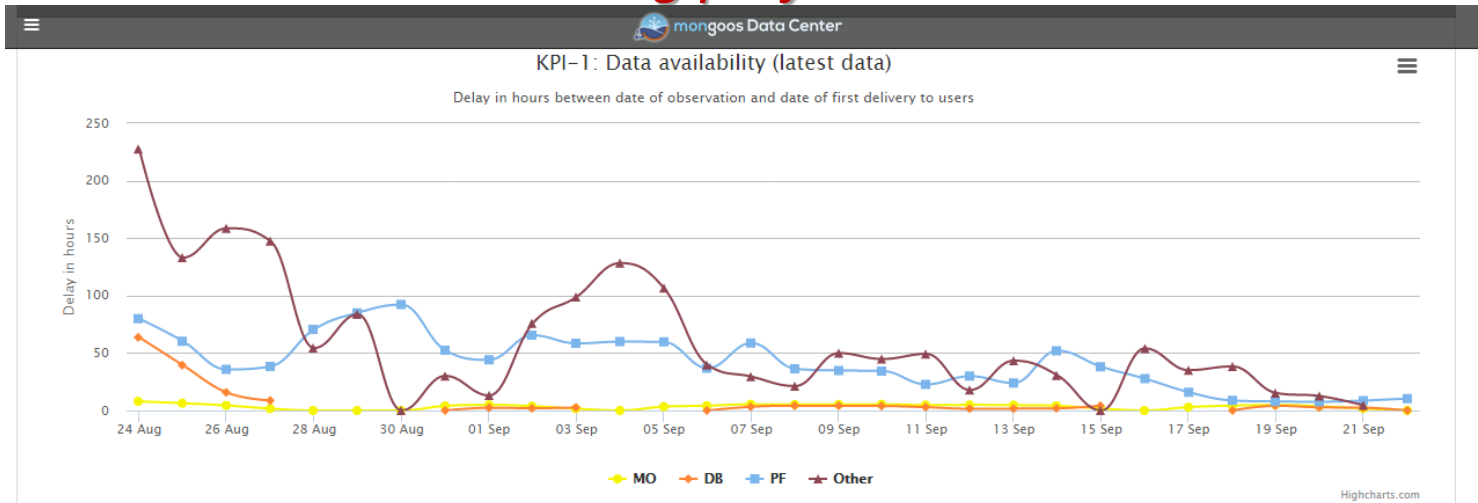
TUR6: turbidity ( milliF.T.U Formaz Turb Unit )

### Biochemical

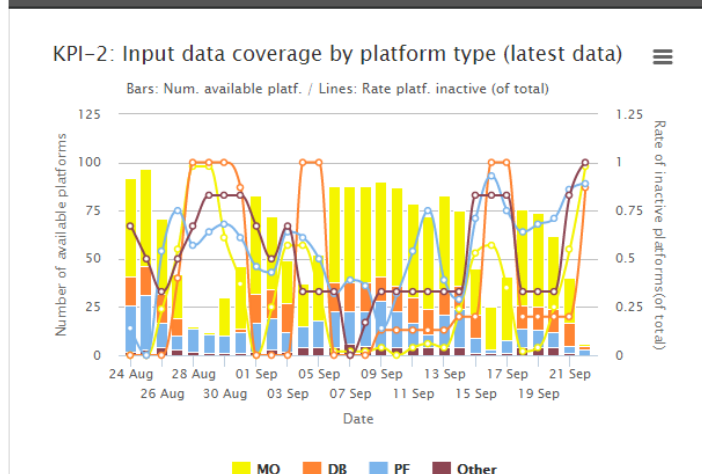
FLU2: Fluorescence ( milligram/m3 )  
OSAT: Oxygen saturation ( % )

# The Mediterranean Data Center

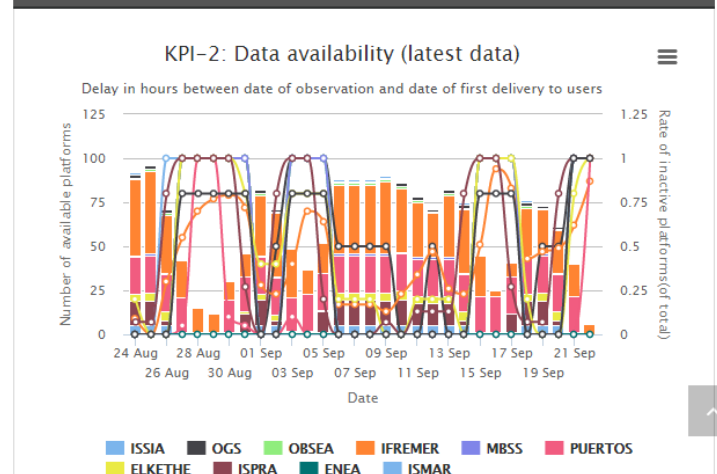
## Monitoring performance



KPI-2a: Input data coverage by platform type (latest data)



KPI-2b: Input data coverage by provider (latest data)



Daily recording of several indicators regarding data capacity, quality of information and timely update of the portal from the data originators

# The Mediterranean Data Center

## *Known gaps in spatial coverage*

### ***Western Mediterranean***

- SOCIB/IMEDEA platforms in Balearic Sea - **Data aggregation on going**

### ***Adriatic Sea***

- OGS (E2M3A, coastal stations in Gulf of Trieste) – **Data aggregation on going**
- CNR ISMAR offshore stations – **Data aggregation on going**
- Croatian stations

### ***Corsica/Sicily***

- Offshore platforms operated by CNR-ISMAR is missing – **Data aggregation on going**

### ***Malta***

- Coastal stations are missing (T&S, sea level)

### ***Cyprus***

- Missing coastal stations (T&S, sea level) - **Data aggregation on going**
- Data from glider missions is included

### ***Turkey***

- Data from Mediterranean platforms is missing – **Agreement with METU**

### ***Israel***

- Coastal stations (T&S, sea level) are missing

### ***Northern African coast***

- No data is available – Limited knowledge about capacity

# The Mediterranean Data Center

## *Future plans under EMODENT support*

### **Data capacity**

- Engage more partners to contribute their data in the portal – Filling the known gaps.
- Coordinated actions are planned in order to gather and disseminate the missing data to the marine community.
- Building stronger connections with Northern African countries. Next MonGOOS meeting will be held in Morocco, 26-28 of November 2014

### **Development**

- Complete support for the data conversion from any kind of input to OceanSites NetCDF format.
- Enhance QC system
- Add downloading capabilities in the MonGOOS web portal.



# The Mediterranean Data Center

## *Summarizing*

- Built as the regional node for the insitu component of the Copernicus Marine Core Service (MCS).
- It's the integrated forward step from the platform-oriented data centers that exist in the Med.
- It is established in compliance with EuroGOOS regional implementation strategy, enhancing the MyOcean capacity by engaging new partners and hosting additional parameters.
- It supports all the major Operational Oceanography projects in the Mediterranean increasing the data interoperability and prevents unnecessary duplication of efforts.
- It is one of the main components of the EMODNET
- A survey for aggregation of missing data will be supported by EMODNET Physics
- Collecting the missing data will complete the real-time marine information of the Mediterranean enhancing also the forecasting products that are delivered through various centers along the basin