



2nd Euro-Argo Users' Workshop Trieste, 15-17th June 2009

# The MOOSE project: an observing system for testing a network of biogeochemical profiling floats in the Mediterranean Sea

L. Coppola<sup>1</sup>, H. Claustre<sup>2</sup>, F. D'Ortenzio<sup>2</sup>, L. Prieur<sup>2</sup>, A. Poteau<sup>2</sup>, A. Mignot<sup>2</sup>, S. Le Reste<sup>3</sup>, F. Mantoura<sup>1</sup>

<sup>1</sup> Observatoire Océanologique de Villefranche-sur-Mer, France

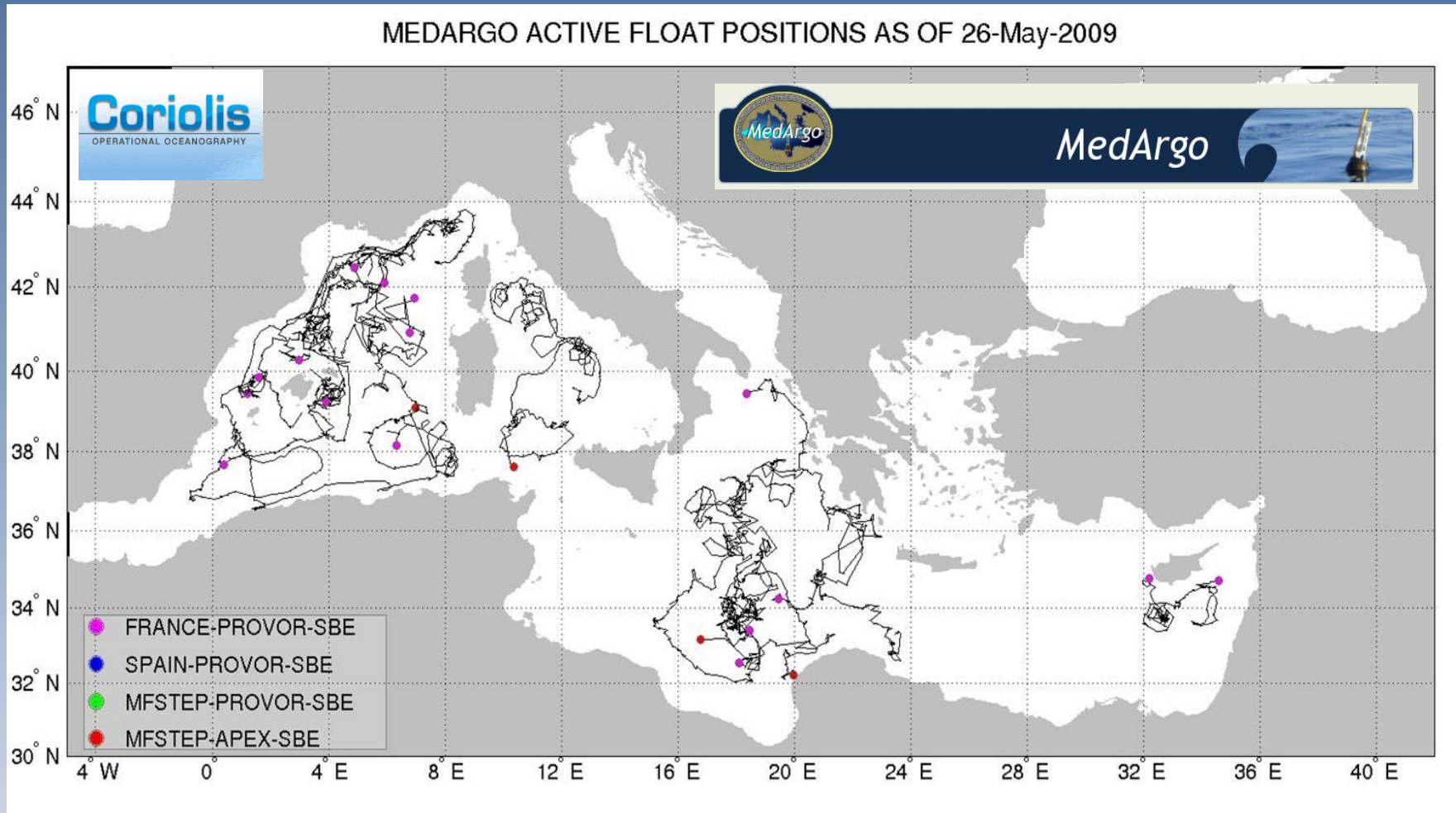
<sup>2</sup> Laboratoire Océanographique de Villefranche-sur-Mer, France

<sup>3</sup> IFREMER Centre Brest, France



# ARGO profiling floats in the Mediterranean Sea

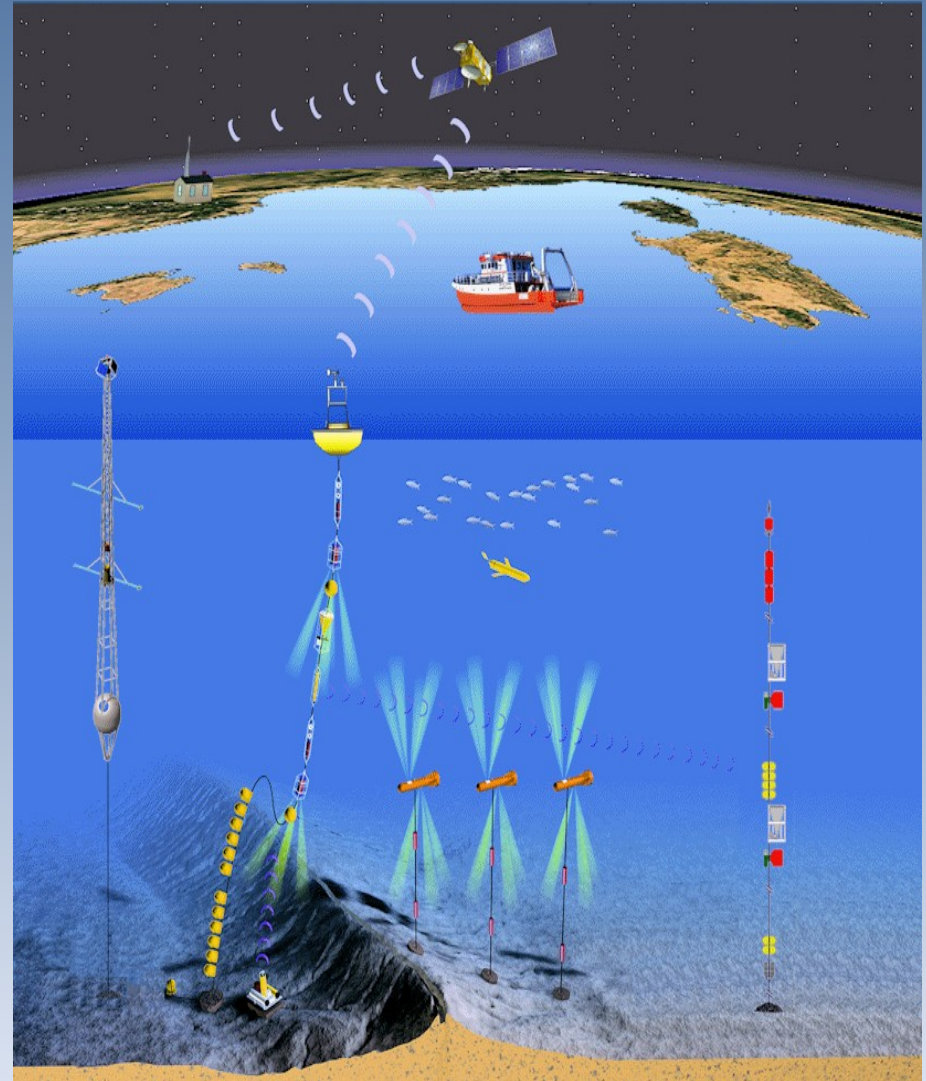
Today in the Mediterranean Sea : 21 active Argo floats with 3 bio-floats...



7 floats CTS3 Provior (Prosat, PI Prieur, Mercator coriolis), 3 CTS3 + 3 Probio from Boum (T. Moutin, L. Prieur, CORIOLIS et ANR PABO) deployed in 08-09 + 3 floats Prosat will be deployed in 09 (1CTS3, 2 Probio)

# Mediterranean Ocean Observing System on Environment (MOOSE)

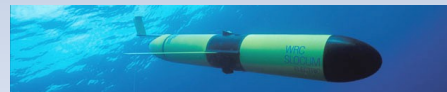
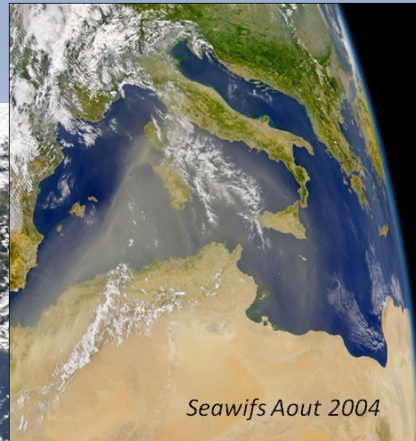
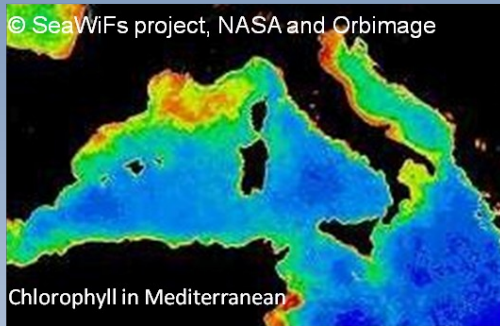
- ✓ Interactive, distributed and integrated network of the NW Mediterranean marine and atmospheric observatories
- ✓ Observe long-term evolution of the NW Mediterranean Sea in the context of the climate change and anthropogenic pressure
- ✓ Set up a common observation strategy between the French labs
- ✓ Share logistic, facilities and staff
- ✓ Include 10 labs and 5 institute



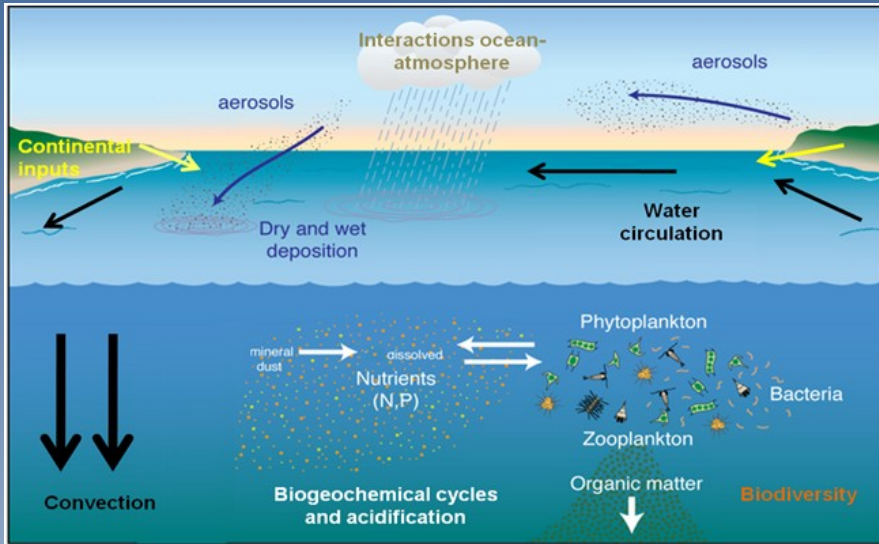


# Objectives

- Project based on innovative scientific questions focused on the Mediterranean evolution: trends and anomalies
- Questions adapted to the long-term observation (10yrs and more)
- Reply to the societal needs: database, operational oceanography, contaminants, biodiversity
- Operational actions will start in 2010



# Scientific issues and transverse actions



WP1- Mesoscale circulation of the North Gyre

WP2- Continental inputs (Rhône)

WP3- Biogeochemical cycle, acidification and contaminants

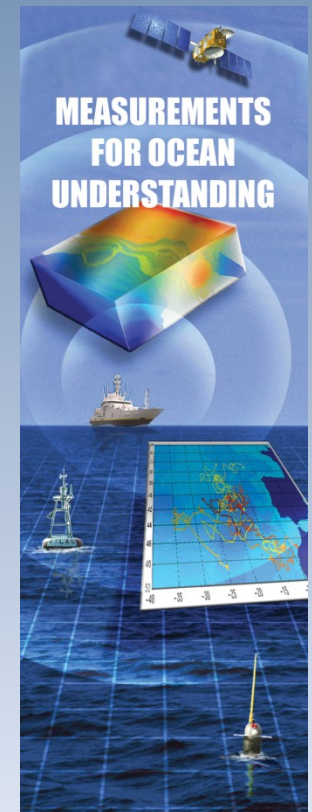
WP4- Biodiversity and biological resources

WP5- Air-sea interactions

- **Operational oceanography (Mercator-Coriolis):** need higher amount of real-time data to improve physical-biogeochemical processes understanding. Possible integration in MOON

- **Data Management (SISMER-CORIOLIS):** dataset storage, public diffusion (e.g. Seadatanet)

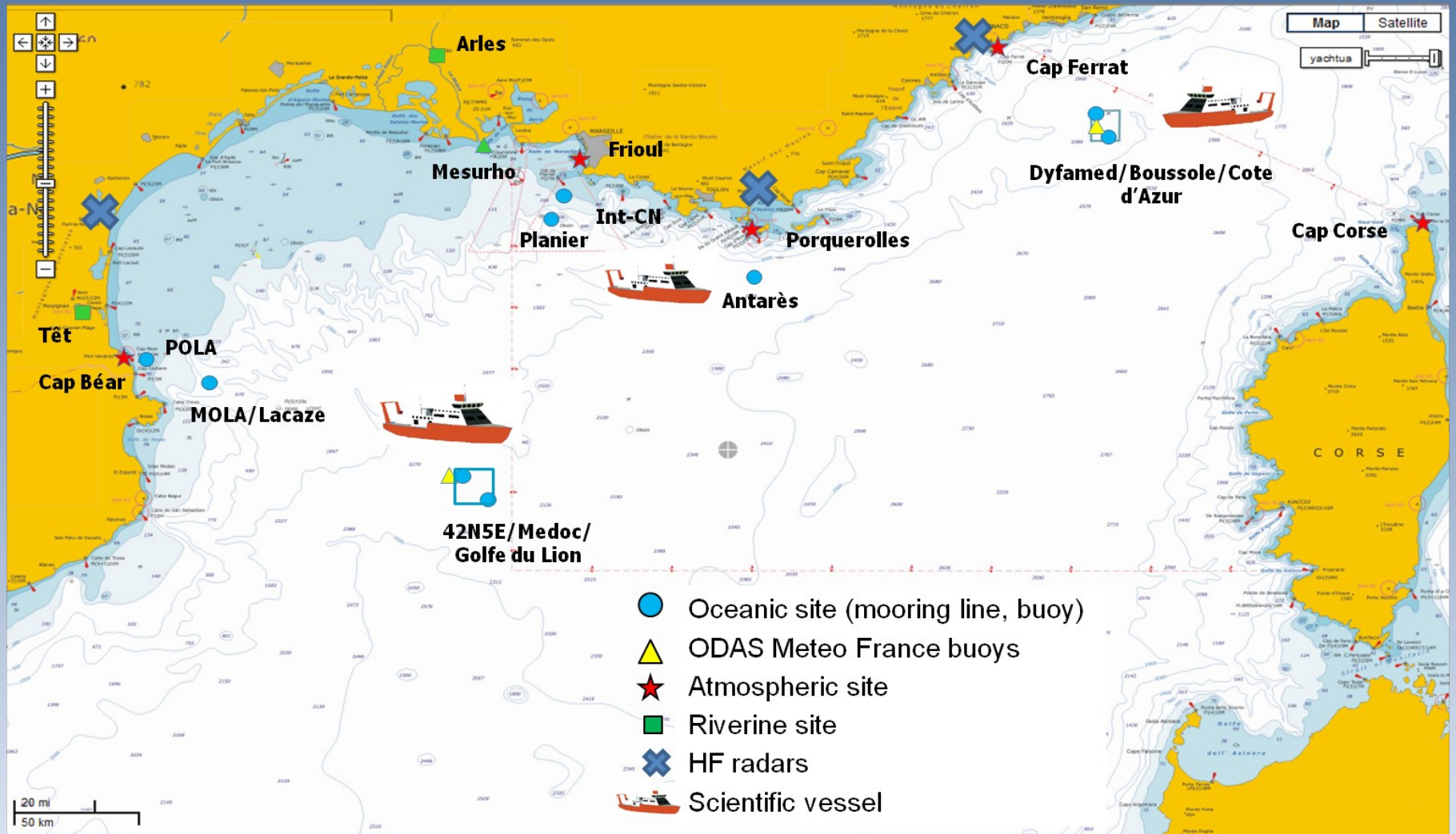
- **New technologies (INSU-IFREMER):** sites used as reception platforms to test new sensors





# MOOSE sites

Network of fixed shallow and deep oceanic stations, riverine monitoring, HF radars (80km) and atmospheric deposition sites



# Gliders transects

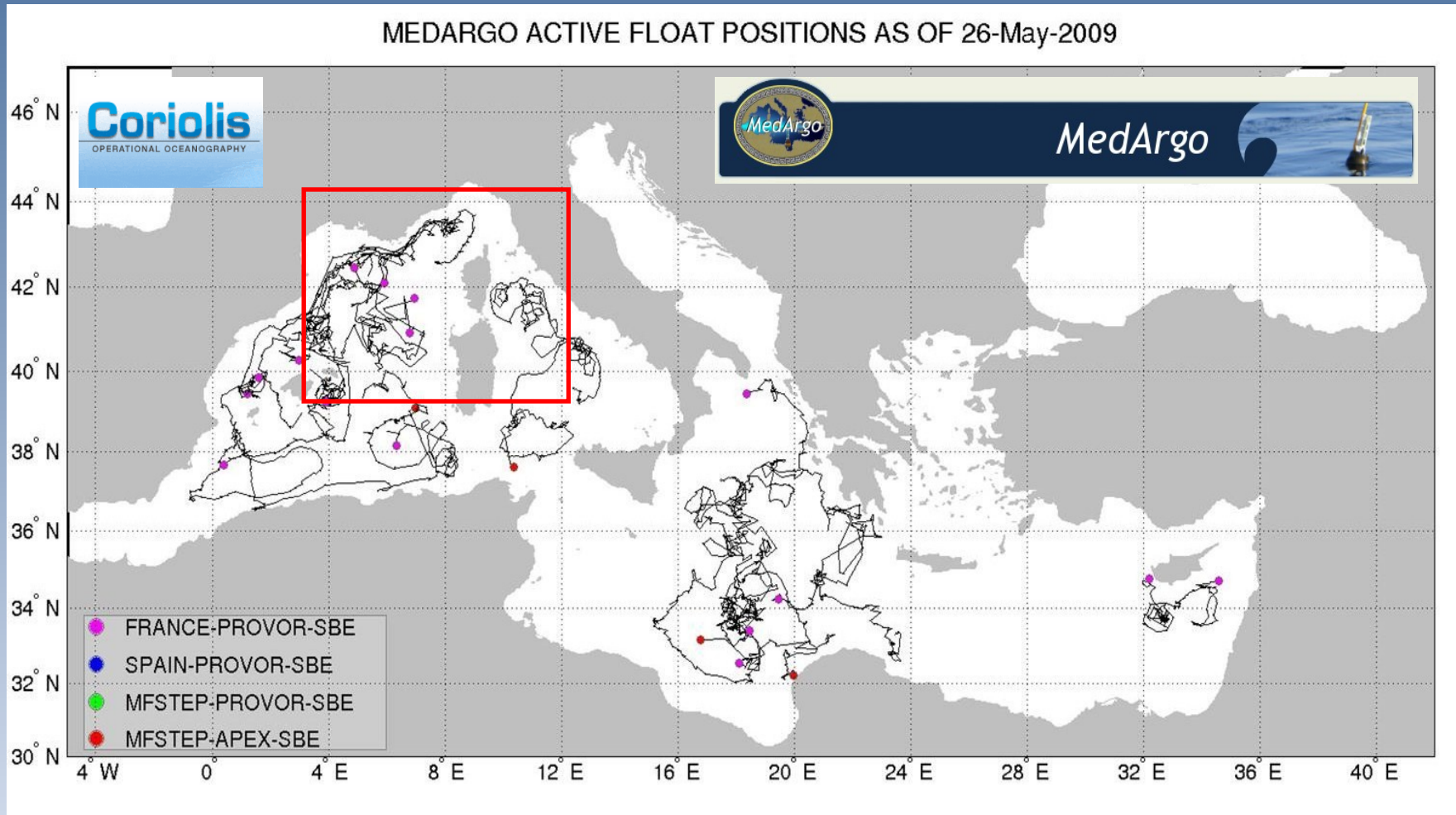
Dedicated to biogeochemistry with better physical description: response of biogeochemistry to the hydrodynamic forcing at sub and mesoscale levels





# ARGO profiling floats

Deployment and maintenance of 2 bio-floats in the NW Med Sea to observe the water mass circulation and its impacts on biogeochemistry



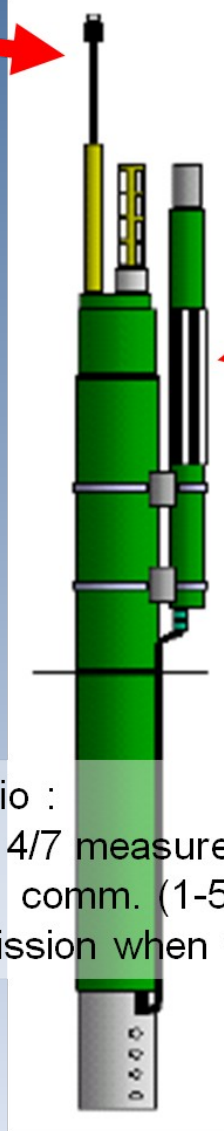
First launch in 2010. Second in 2011. Other floats deployments through other Med actions in 2012-2013 (HYMEX, MERMEX)



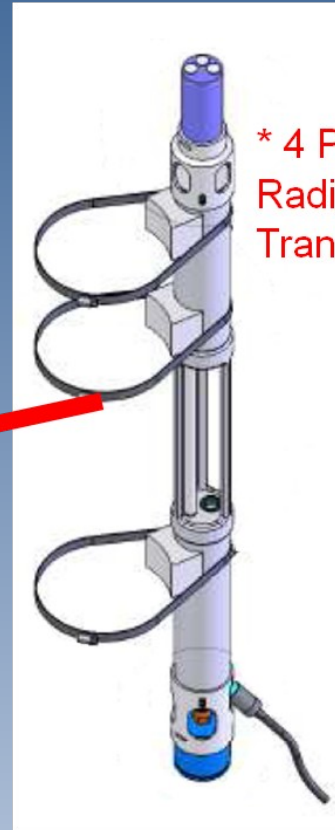
# ARGO profiling floats in biogeochemistry



Provor :  
only CTD  
argos comm. (8-12h)  
same mission forever



•ProvBio :  
CTD + 4/7 measurements  
Iridium comm. (1-5 min)  
new mission when we want



\* 4 ProvBio A:  
Radiomètre (442, 490, 555)  
Transmissomètre (660)

\* 8 ProvBio B:  
Radiomètre (412, 490, 555)  
Transmissomètre (660)  
Chla CDOM bb (540)

- ANR PABO
- projet PABIM  
(Groupe mission Mercator Coriolis)

# Example of biogeochemical real-time data online

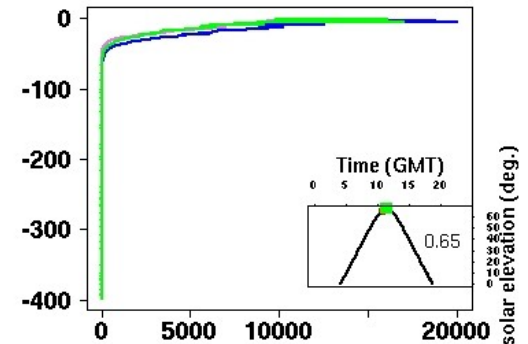
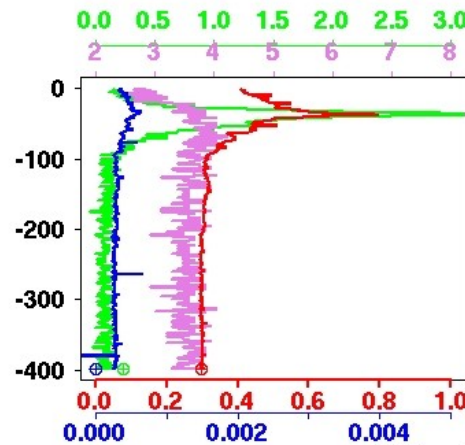
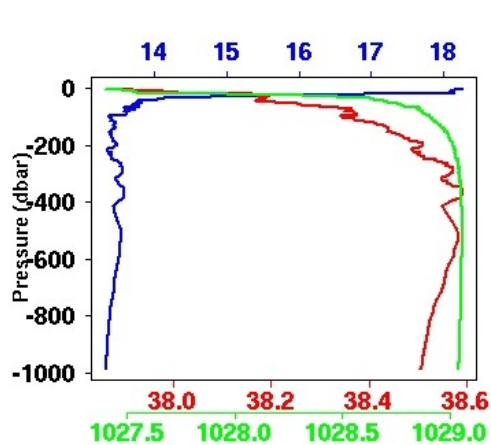
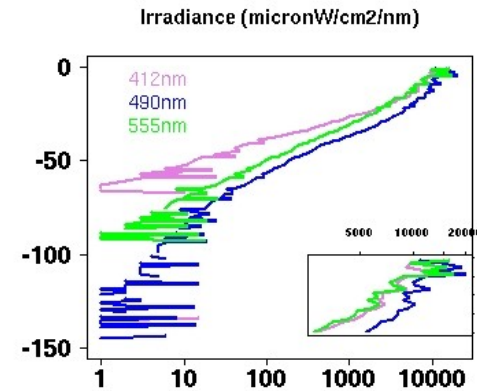
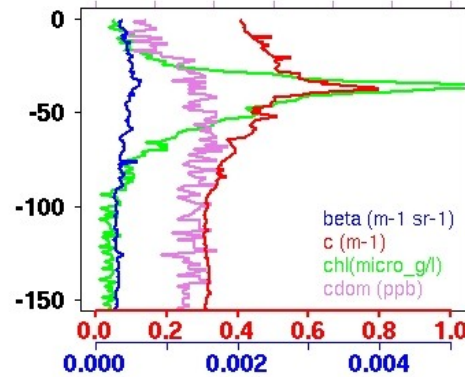
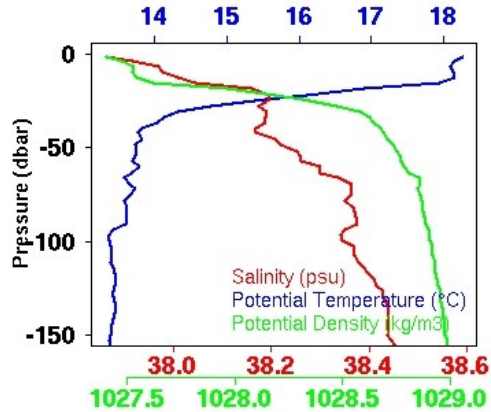
Cycle number: 13 MED\_NW\_B02\_6900677 Mediterranean\_sea (Lat: 43.33 Lon: 7.12 )

22 May 08 10:51 GMT

IOPs & Transmissometer

0.0 0.5 1.0 1.5 2.0 2.5 3.0

2 3 4 5 6 7 8

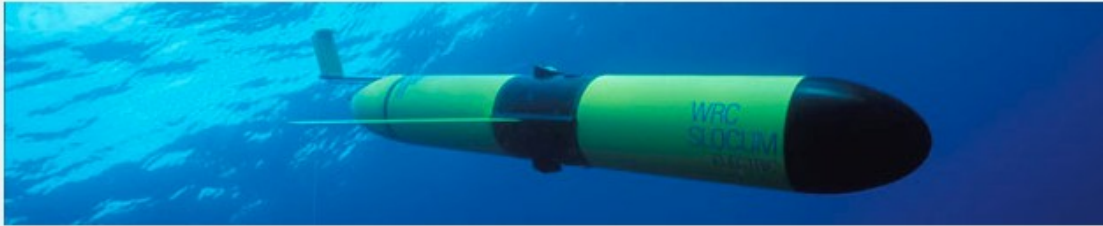


R file: 300224010512160\_20080430120000\_20080522110700\_000105\_000109.sbdB.RData (Plot update : 19-Jun-08 11:30 GMT) (Next at: 11)

Real-time biogeochemical data will be send to Coriolis



- Home
- Projects
- People
- Data
- Gliders
- Profiling Floats
- Media & Publications
- Internal



## Oceanographic Autonomous Observations

The OAO project brings together scientists to collaborate on the latest technical advances in automatic platforms, robotic **gliders** and **profiling-floats** for the development of a realtime in-situ acquisition system for bio-optical and biogeochemical data.

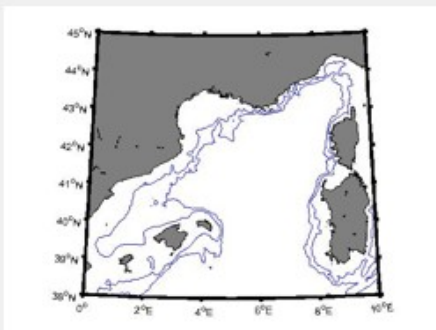


UNIVERSITÉ  
PIERRE & MARIE CURIE

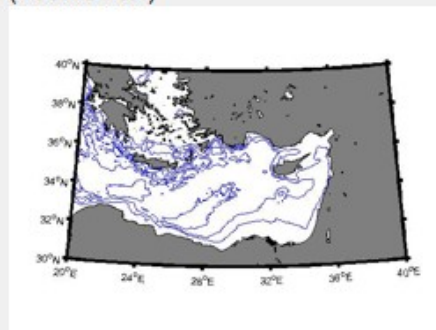


### Highlights: Floats realtime position

**NW Mediterranean**  
(7 active floats)



**East Mediterranean (Ionian Sea and Levantine Basin)**  
(4 active float)





# Real-time visualisation

<http://www.obs-vlfr.fr/OAO/provbio/ProvBio.kml>

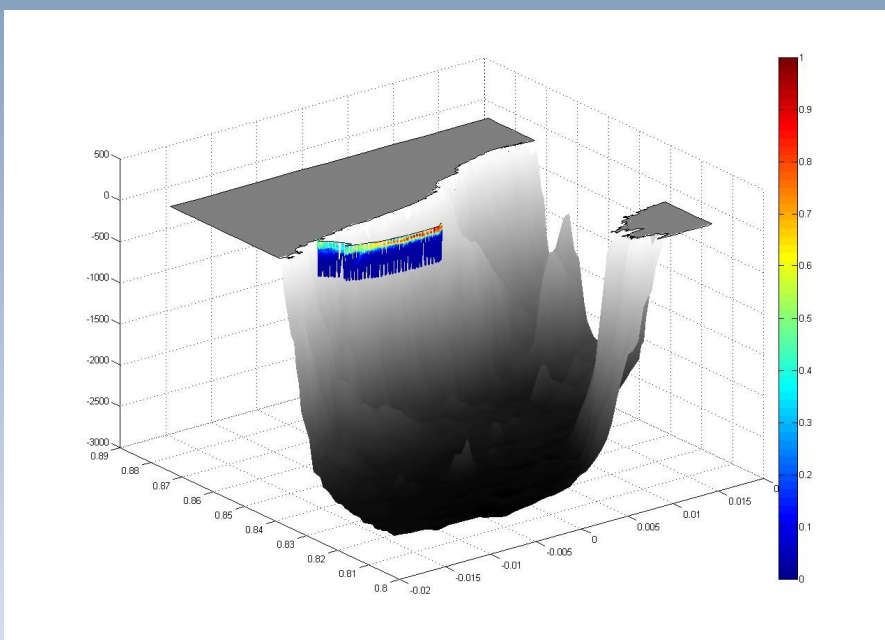
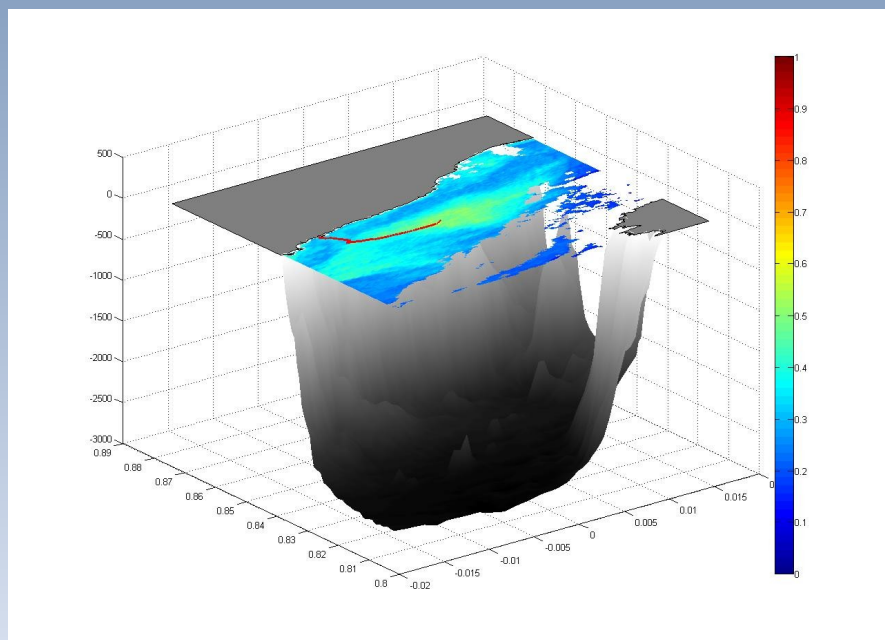


# Importance of satellite observation

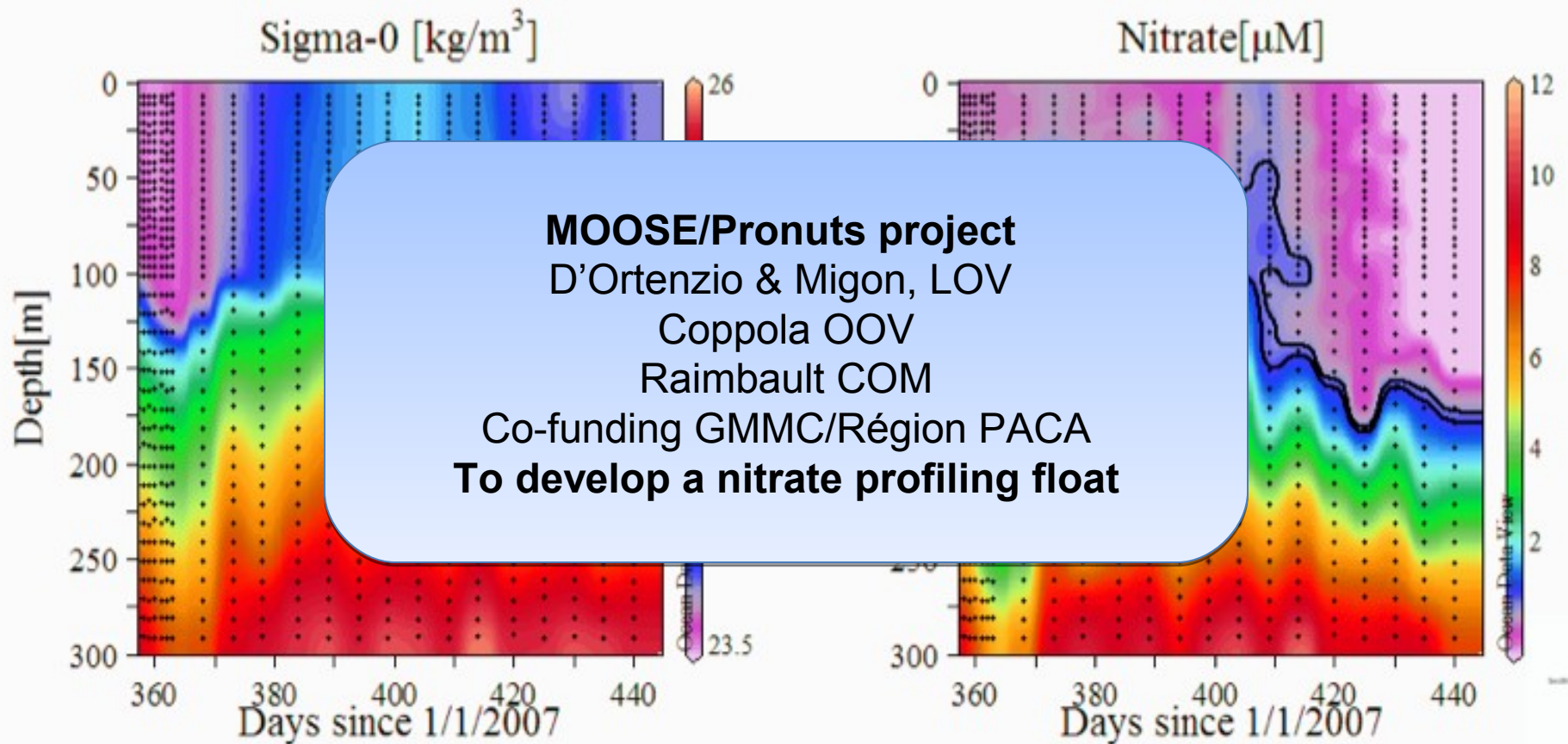
## Observations are complementary: horizontal vs. vertical

Remote sensing in collaboration with ACRI-Globcolor:

- Measurements are totally automatic (human efforts to prepare deployments)
- Data are available in real-time
- Time coverage is permanent
- Observed parameters are the same



# Apex Float + CTD + nitrate optical sensor (ISUS-like) + oxygen sensor + iridium



North Pacific Gyre, vicinity Hawaii

60 depths sampled every 5 days  
expected lifetime = 4 years !

*Johnson, pers. comm. 2008*





**Thank you for your attention**

**Site web: [www.obs-vlfr.fr/moose](http://www.obs-vlfr.fr/moose)**

**Contact: [coppola@obs-vlfr.fr](mailto:coppola@obs-vlfr.fr)**

