Data quality control of the biogeochemical floats: feedbacks after the first deployments

Fabrizio D'Ortenzio & Hervé Claustre

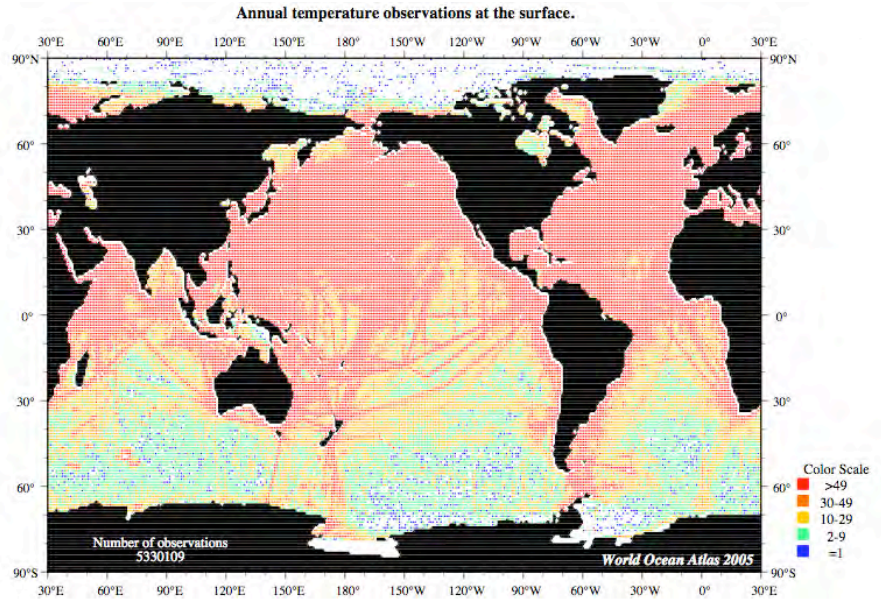
Laboratoire d'Océanographie de Villefranche

Presentation plan

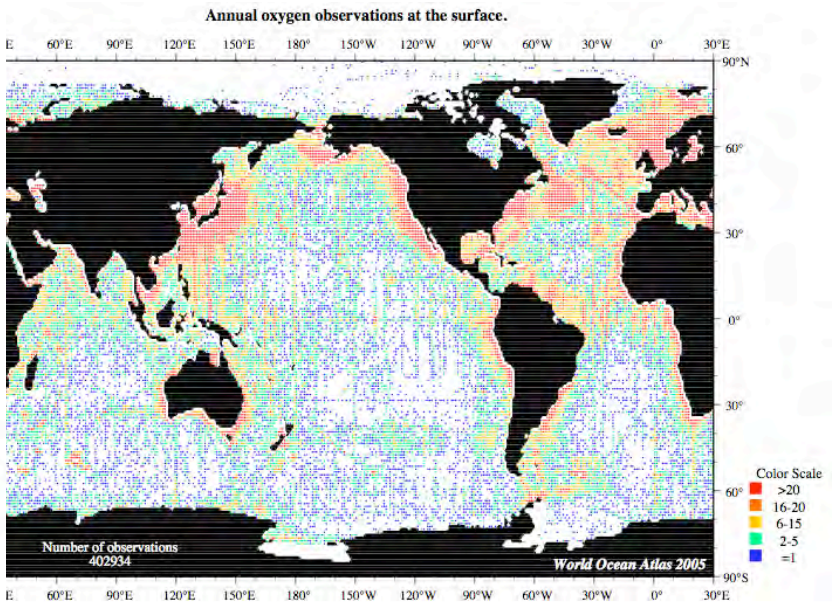
- Introduction
- The PROVBIOs
- The deployment in the NW Mediterranean
- Feedback after 2 months operation
- Conclusions and Perspectives

• Introduction

Oceanic biogeochemistry lacks in observations



Temperature (red > 49)



Oxygen (red > 20)

Number of in situ surface observations in the World Ocean Atlas 2005 Data distribution

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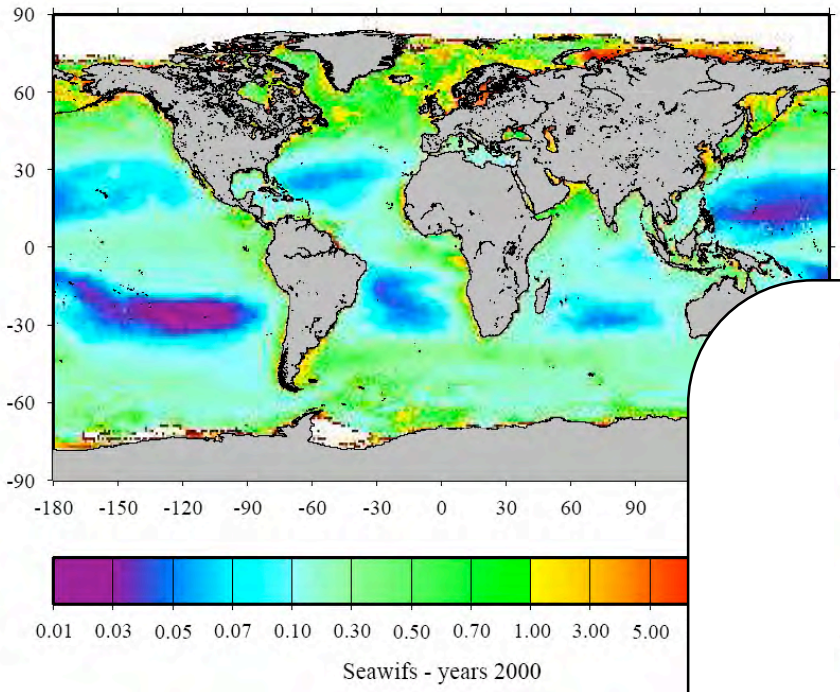
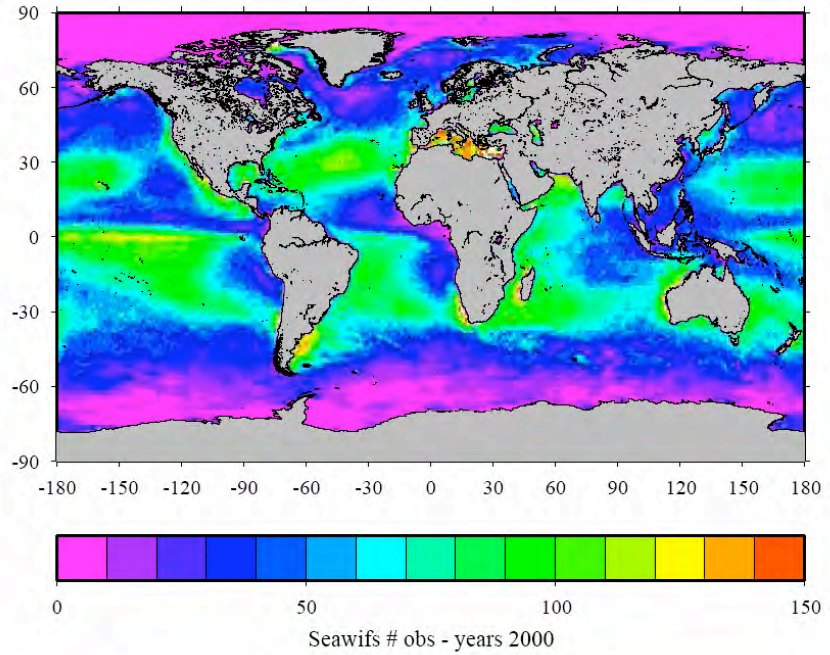
Oceanic biogeochemistry lacks in observations





- Introduction

Oceanic biogeochemistry lacks in observations

Autonomous measuring platforms represent the "*deux ex machina*" to unblock the impasse.

But, biogeochemical sensors were still too large and too energy consuming to be effectively mounted on autonomous platforms .

However, things are changing.

- Introduction

Oceanic biogeochemistry lacks in observations

Things are changing:

Miniaturized, low energy consuming, biogeochemical sensors are being developed.

Several companies have begun to commercialize instrumental biogeochemical pucks specifically designed for autonomous platforms.

More and more performing batteries allow sustain highly energy demanding instruments.

New generation telecommunication satellites ensure high rate transmission all over the world, multiplying by 10 the quantity of data which is possible to transmit.

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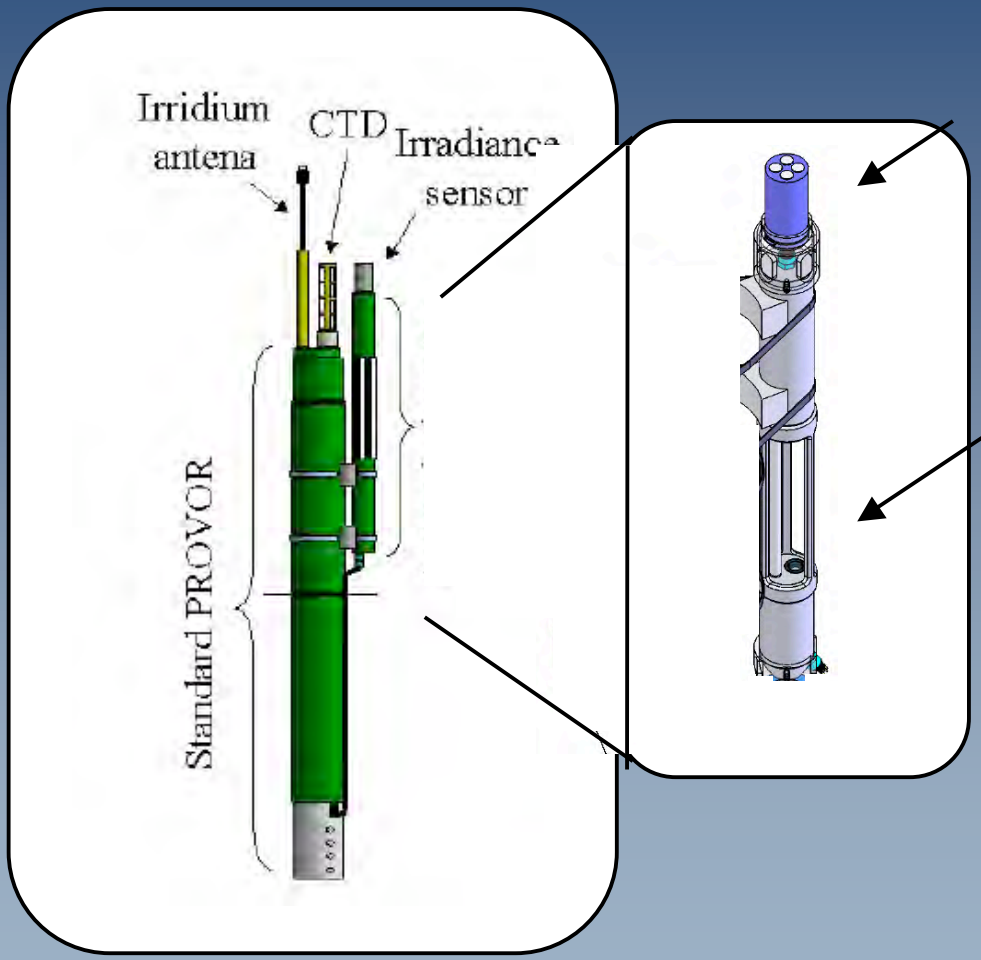
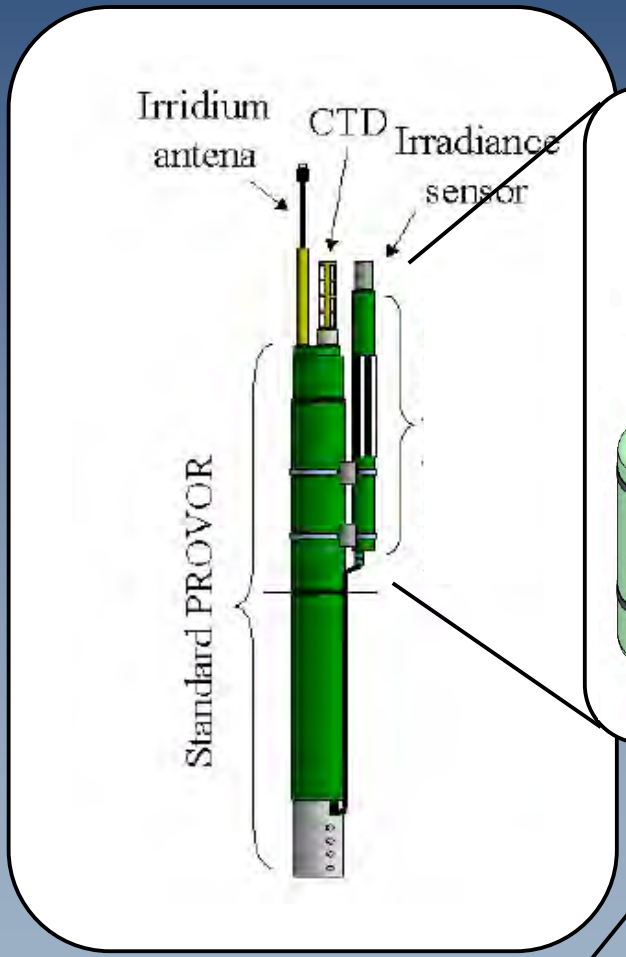
The PROVBIOs : PROVBIO - A

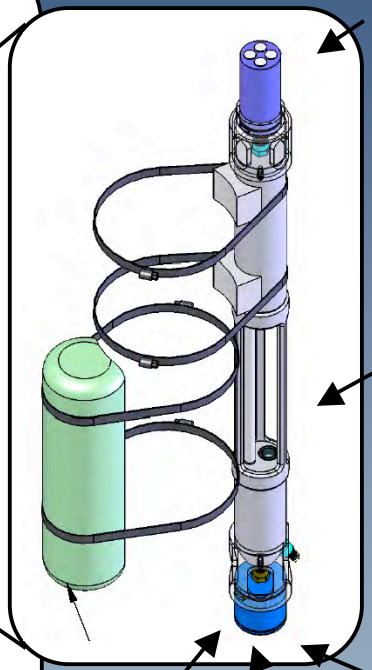


Three wavelengths Irradiance Sensor

Transmissiometer

The PROVBIOs : PROVBIO - B





Three wavelengths Irradiance Sensor

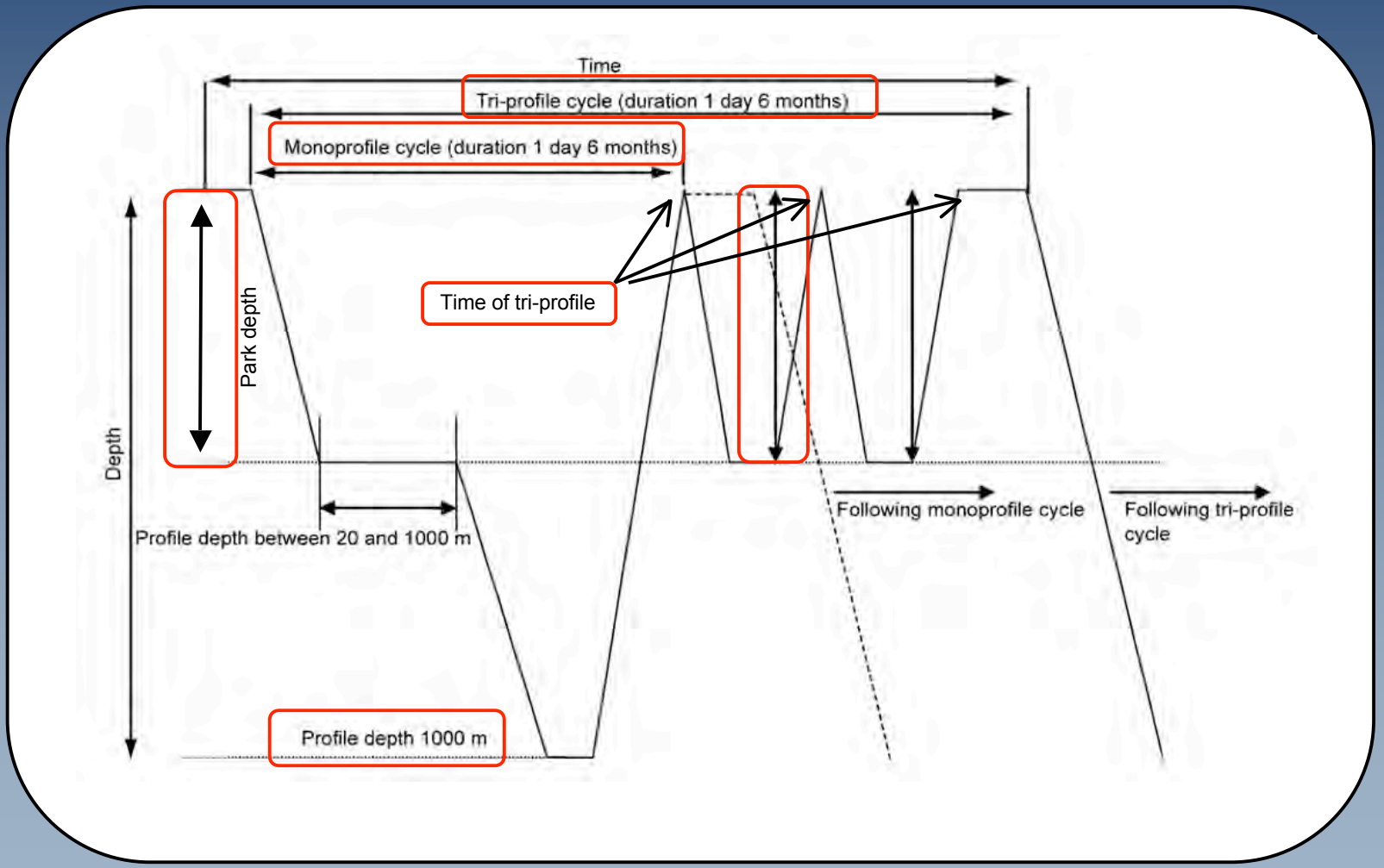
Transmissiometer

Fluorometer CDOM

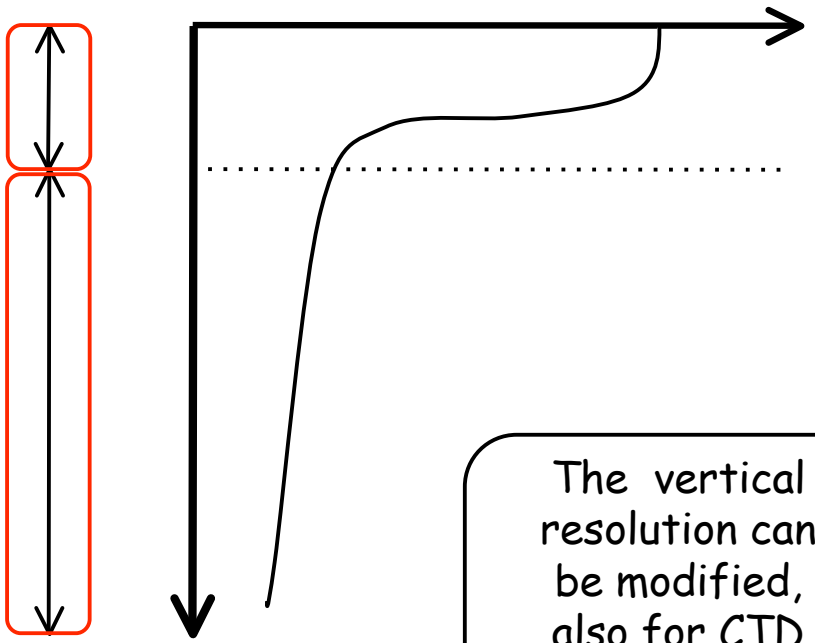
Backscatterometer

Fluorometer Chla

The PROVBIOs : Changing the mission's parameters



The PROVBIOS : Changing the mission's parameters



Surface

Bottom

The vertical resolution can be modified, also for CTD data

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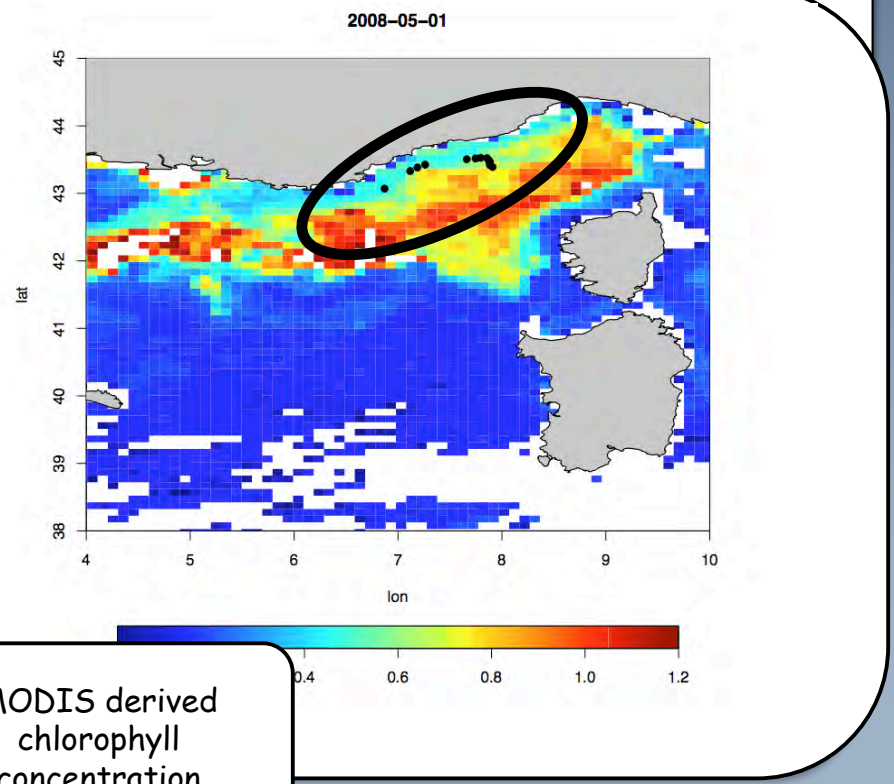
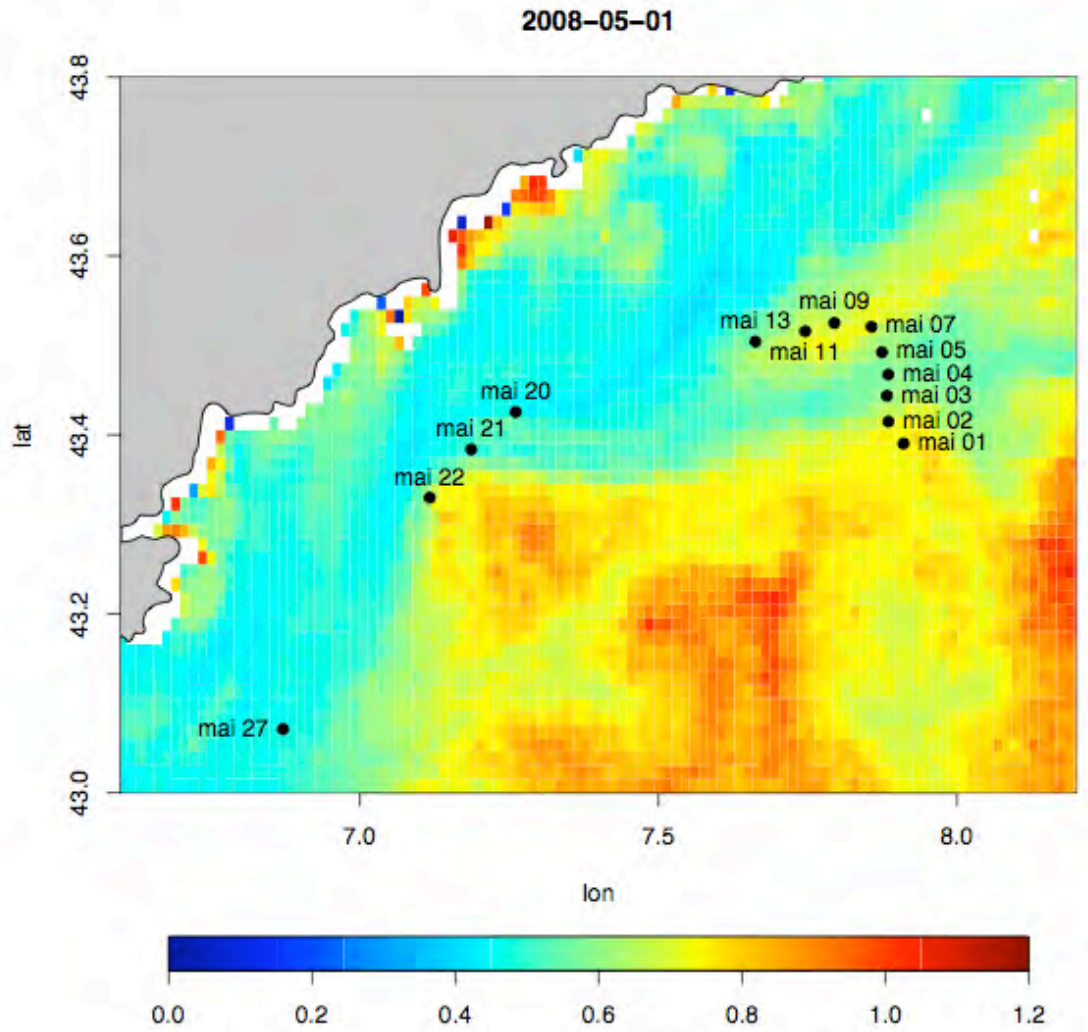
The deployment in the NW Mediterranean

- Two PROVBIOs have been deployed in the NW MED
- One was recovered after 20 days
  - "End of life" command was sent to the float (i.e. surfacing, transmission of position each hour)
  - Recover with a zodiac near Antibes
- The second PROVBIO-B is still operational

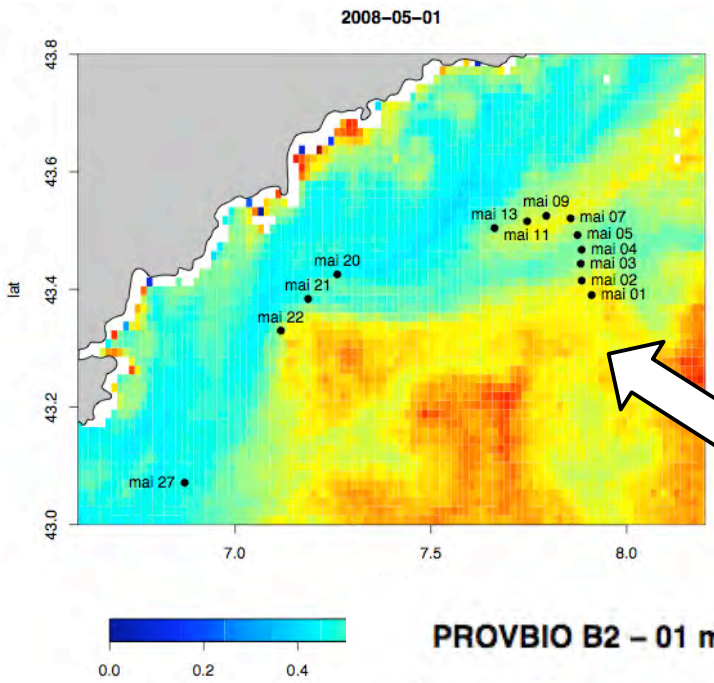


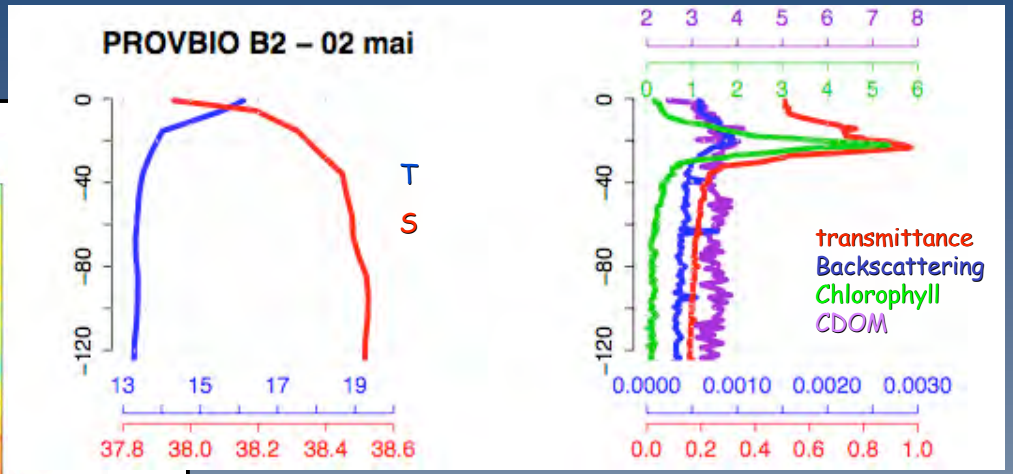
MODIS derived chlorophyll concentration

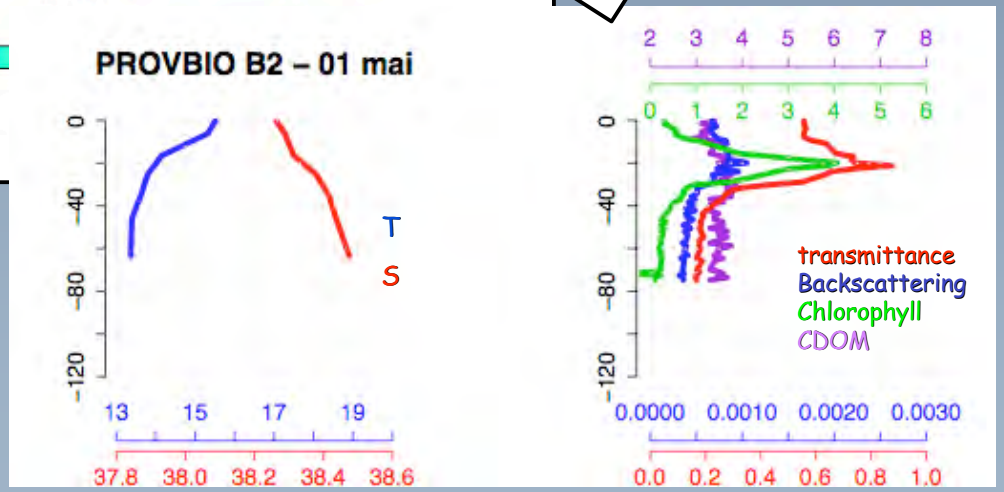
The deployment in the NW Mediterranean



•The deployment in the NW Mediterranean

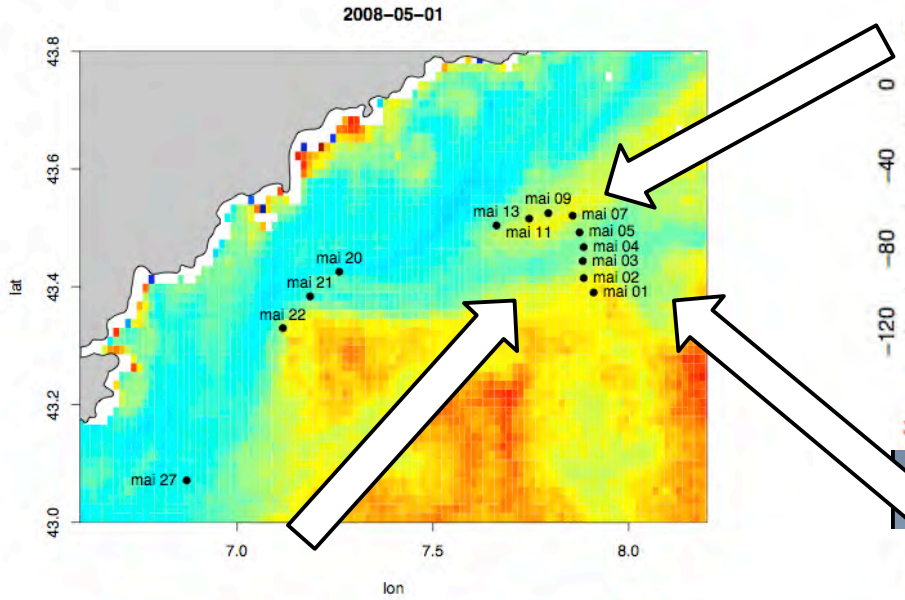


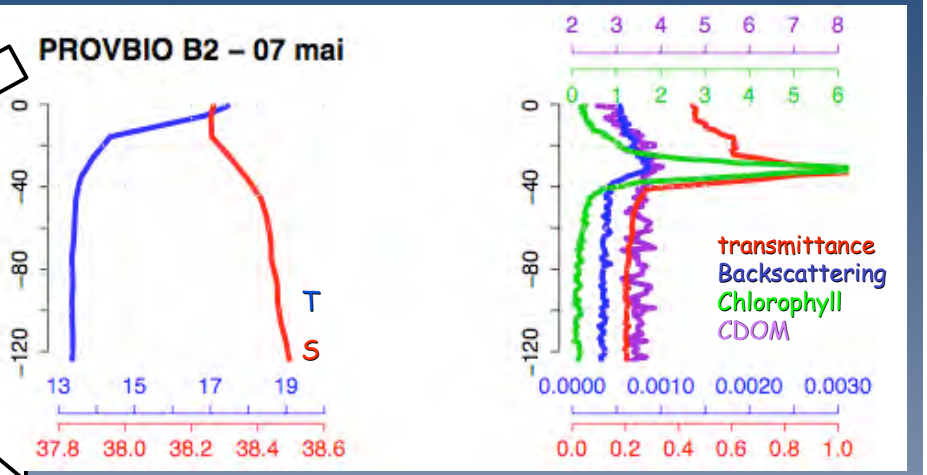


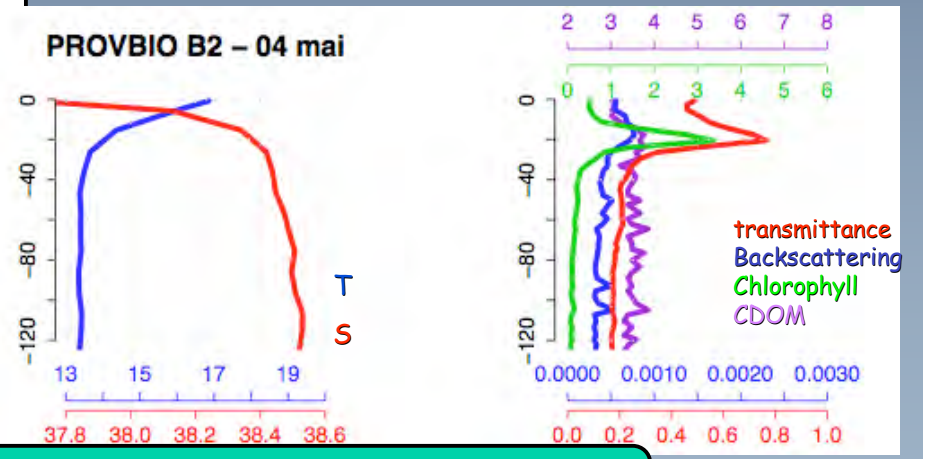


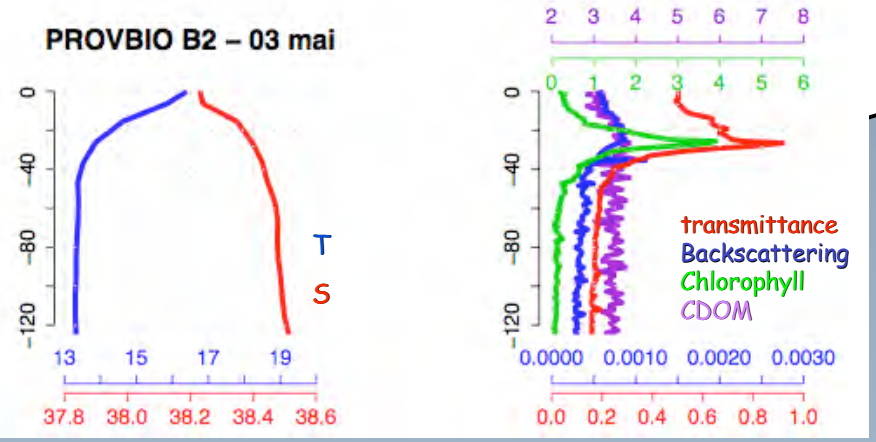
In the bloom

- The deployment in the NW Mediterranean



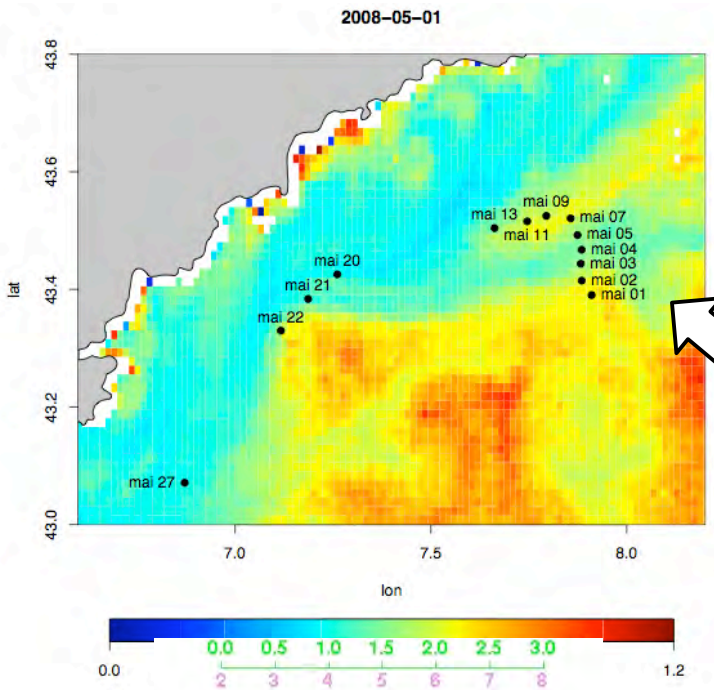


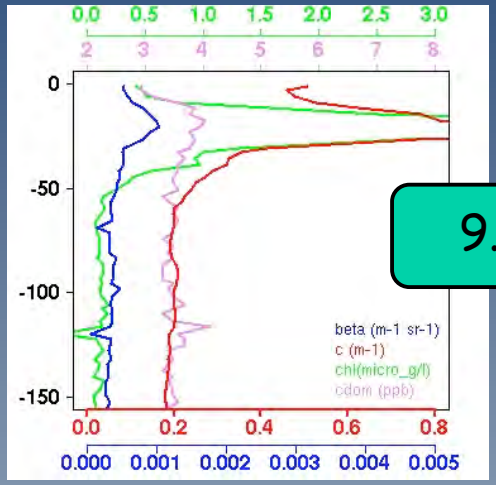




A coastal water intrusion

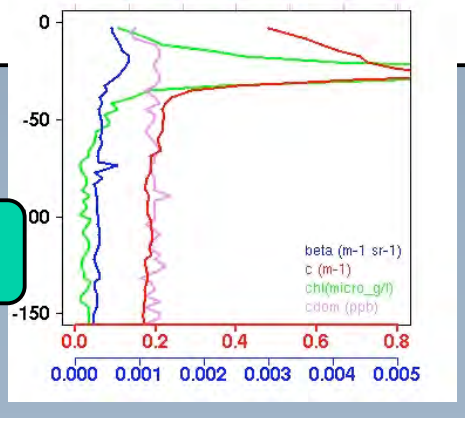
- The deployment in the NW Mediterranean



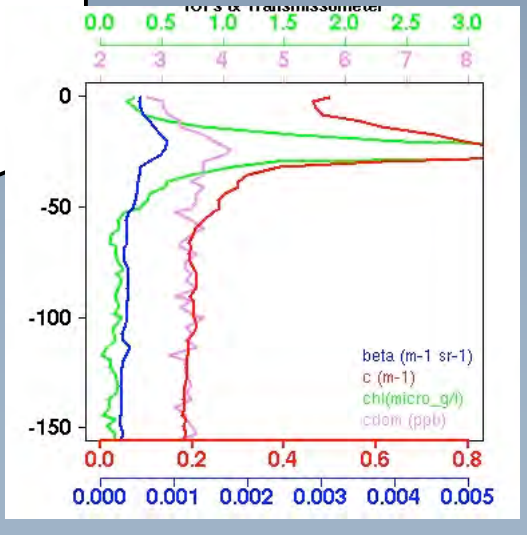


9.00 h

A tri-profile

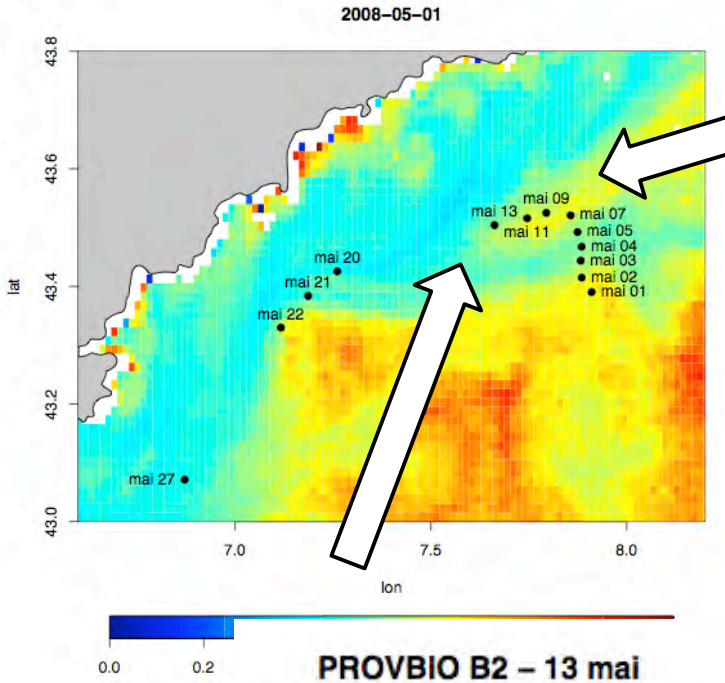


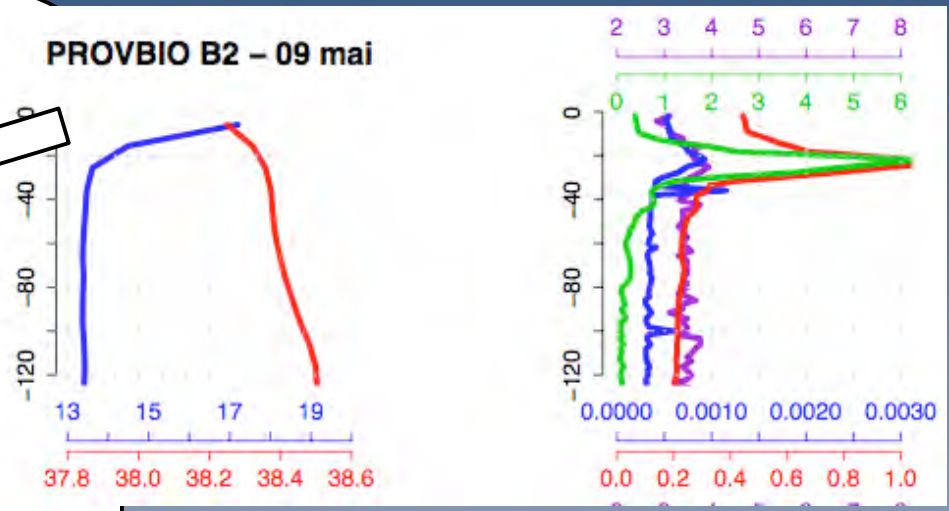
17.50h



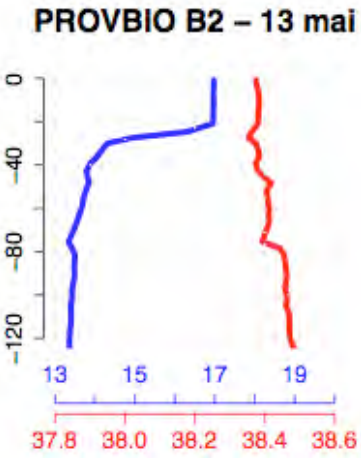
11.50h

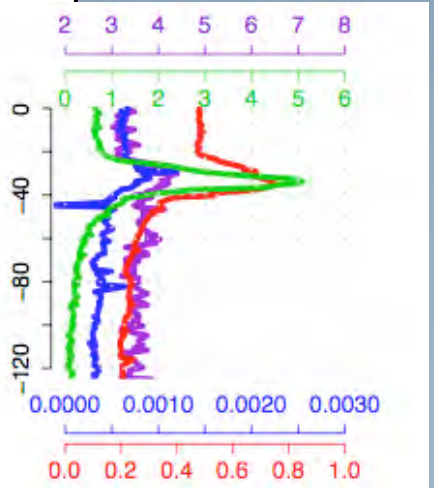
- The deployment in the NW Mediterranean





Changing CTD resolution





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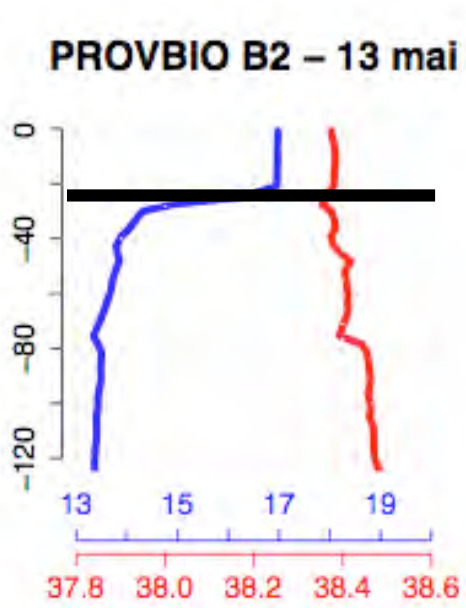
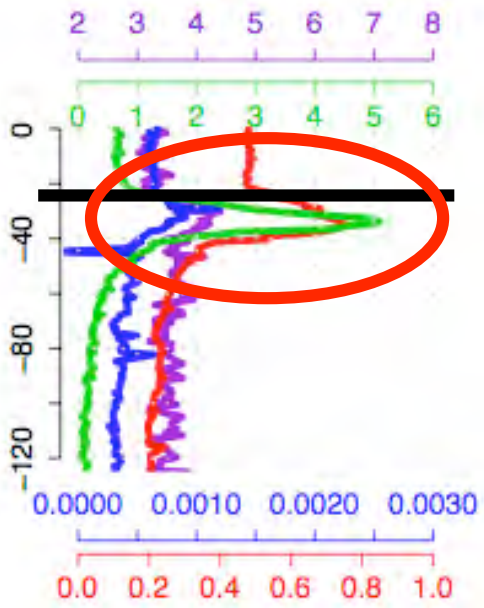
Feedback after 2 months operation (1)

- For instance, the quality control is limited to the « visual inspection » of profiles (only 18 cycles available):
  - No evident drift observed on data (but transmittance at depth shows weak bias after 15th cycle)
  - General coherence of the vertical patterns of the different parameters

Mixed Layer Signature in the biogeochemical parameters

Deep maxs for C, chl, CDOM and Bb



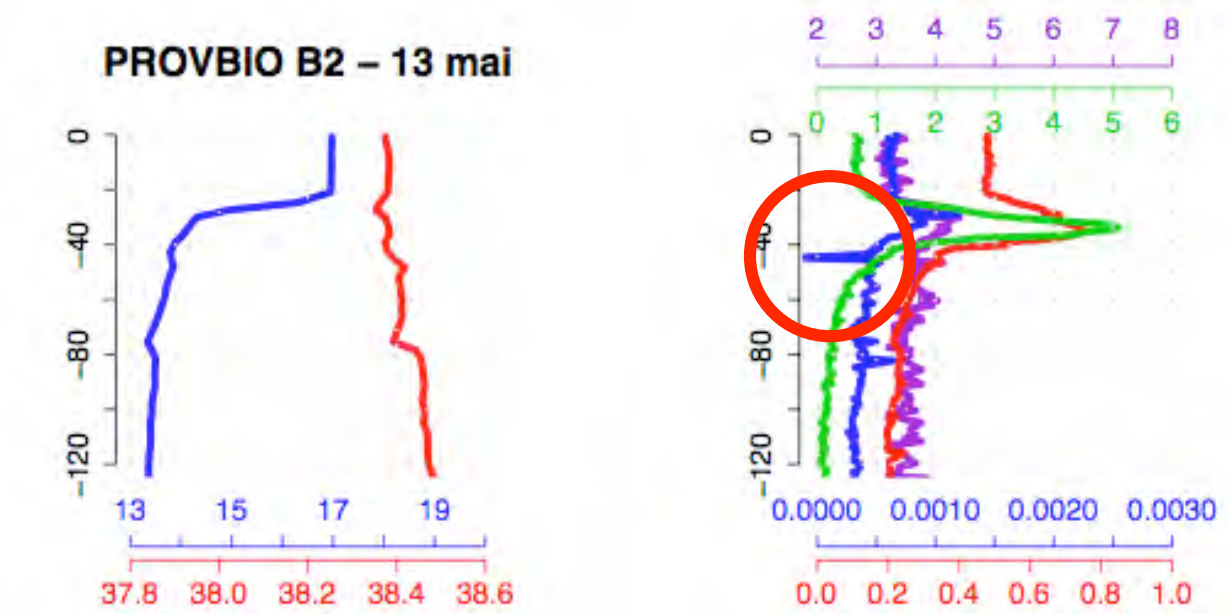


Feedback after 2 months operation (2)

- For instance, the quality control is limited to the « visual inspection » of profiles (only 18 cycles available):

- Data are not noisy (*chl* and *c* more "clean" than *CDOM* and *Bb*)
- Spikes exist, but they are rare

Bb spike



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Perspectives: future deployments

5 B	NW Med	(PROSAT, FR)

1 A and 1 B	North Atlantic Irminger Sea	(OVIDE, FR)
1 A and 1 B	North Atlantic Island Basin	(NAB, US)
1 A and 1 B	Eastern Med Basin	(BOUM, FR)
2B	South Pacific Gyre	(Easter Islands Fishing boat)
2B	North Pacific Gyre	(HOTS, US)
1 A and 1 B	NW MED	(BOUSSOLE, FR)

Plots, positions et news sur:

www.obs-vlfr.fr/OAO/Floats_page.html

Conclusions

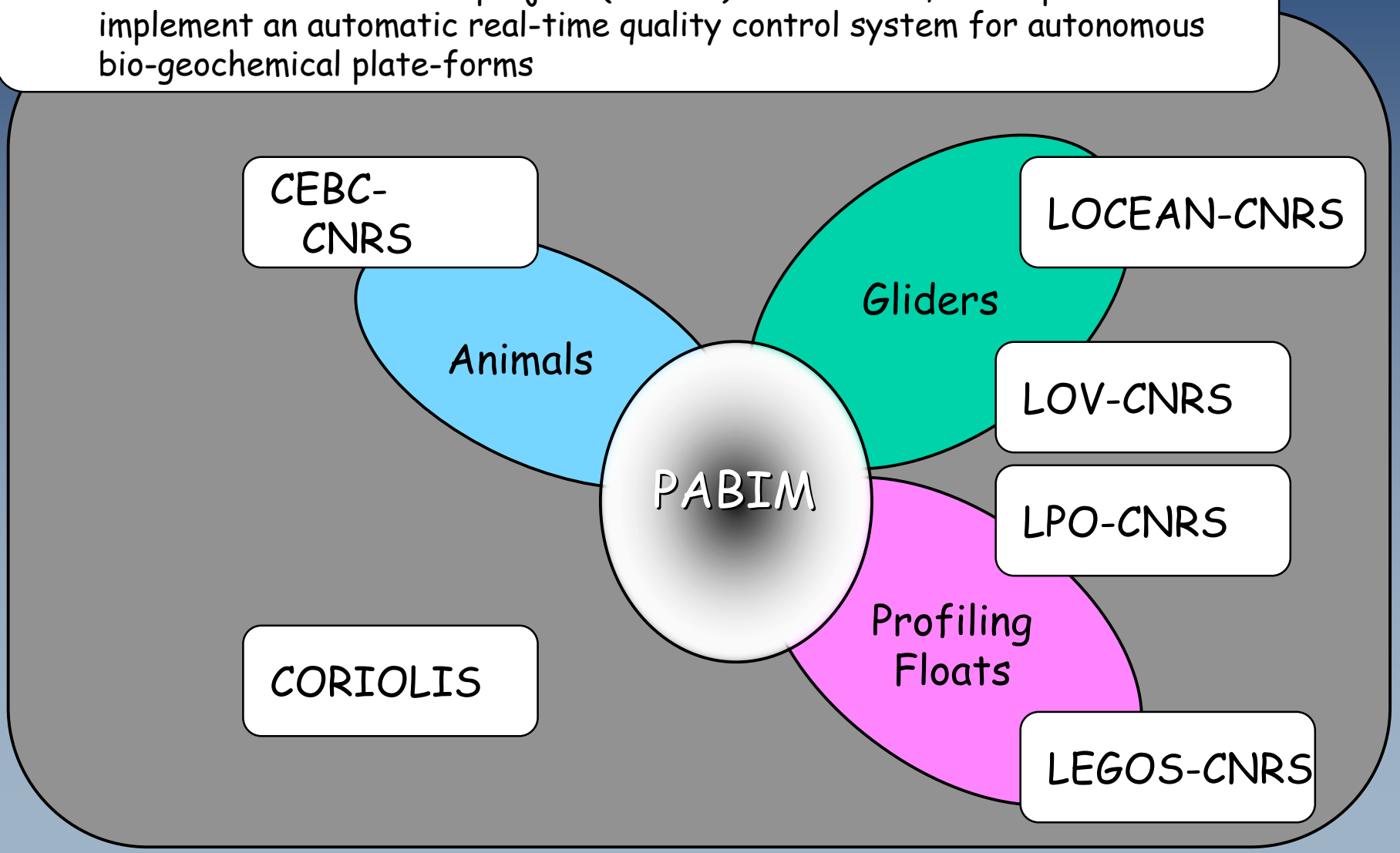
NW Med PROVBIOs experiment demonstrated that :

- PROVBIO platform technology is mature for an operational use
- PROVBIO data are generally accurate, though a more in depth analysis is required (only "visual inspection" was performed)

The next step will require an automatic quality control procedure, on the same line of the Argo system.

Conclusions

The Group Mission Mercator Coriolis, in the framework of EURO-ARGO, funded in the 2008 a dedicated project (PABIM) to establish, develop and implement an automatic real-time quality control system for autonomous bio-geochemical plate-forms



Acknowledgements

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Kannad inc.

Group Mission Mercator Coriolis (GMMC)

EURO-ARGO project

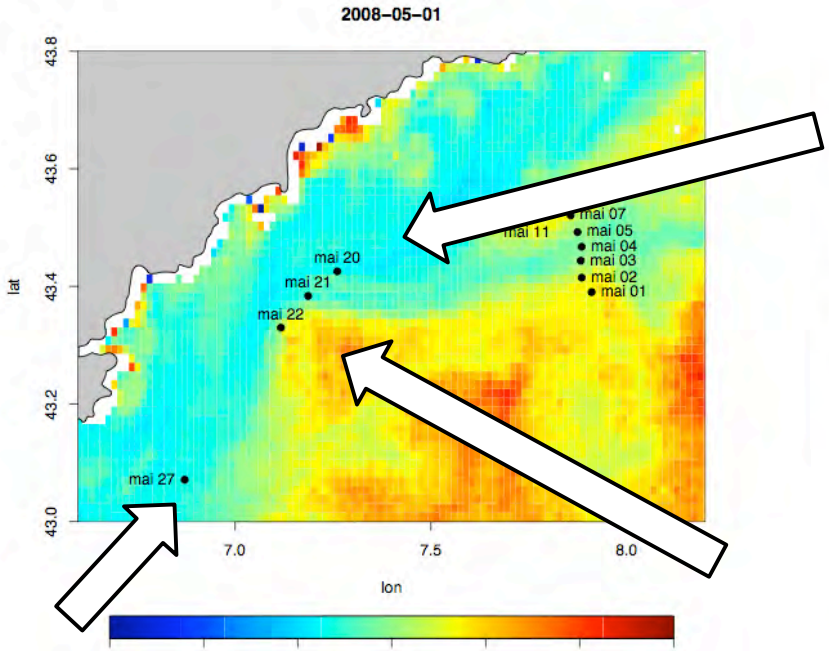
French Space Agency (CNES)

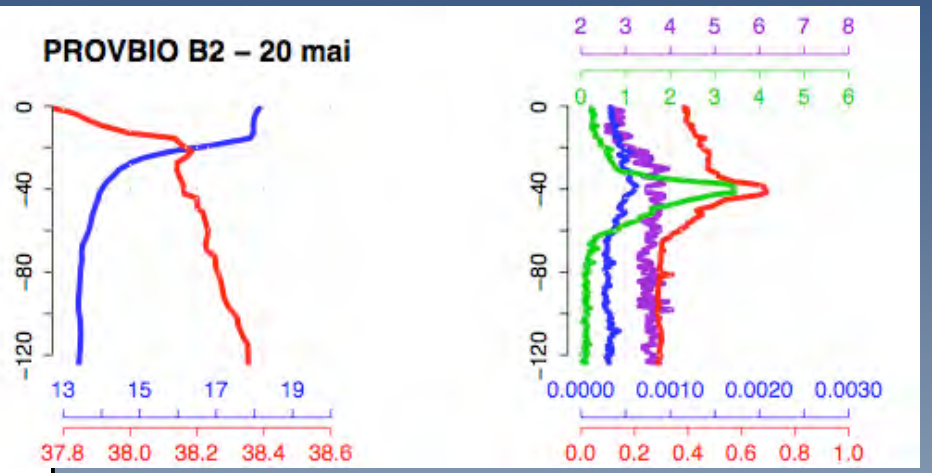
ANR - PABO

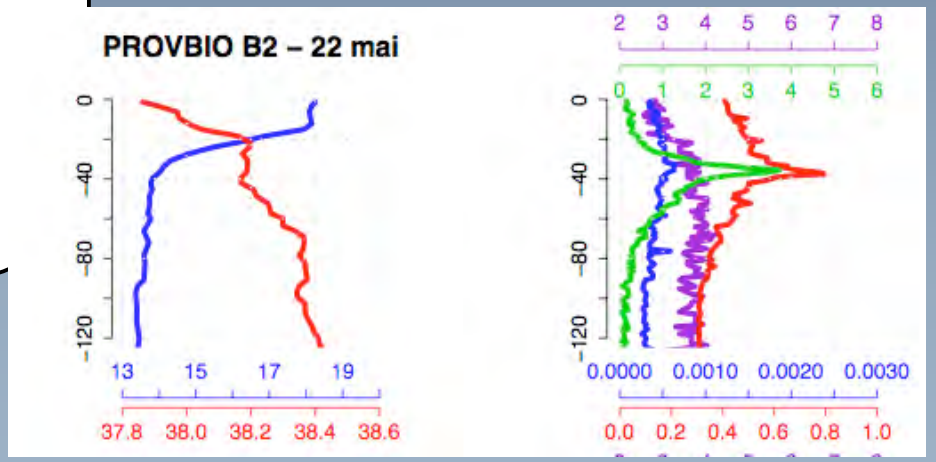
BOUSSOLE projet

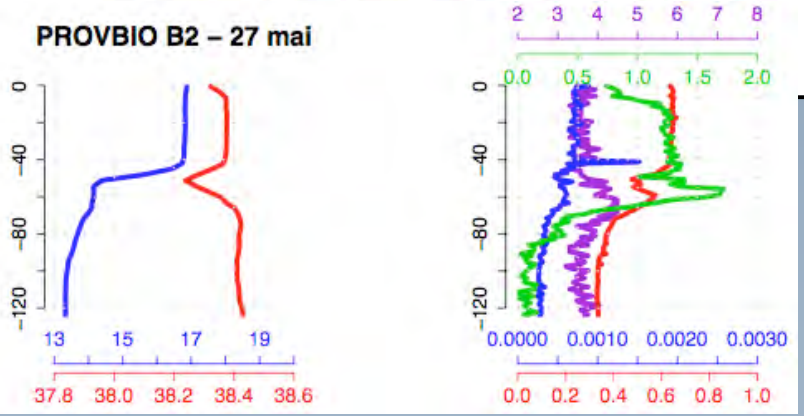
Thank you

- The deployment in the NW Mediterranean









Changing cycle time