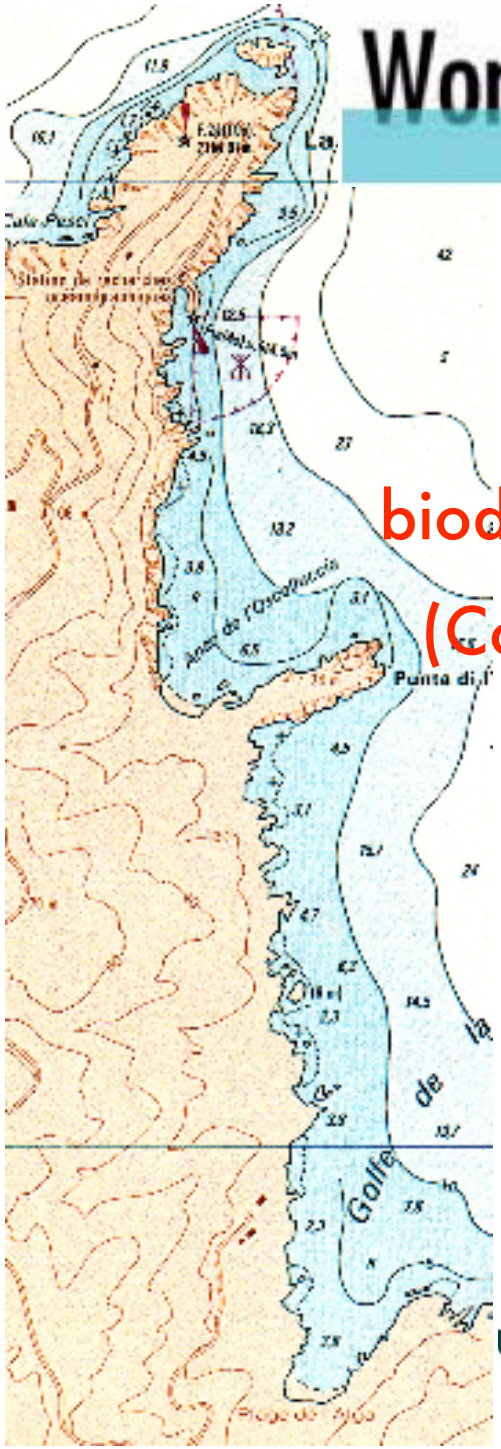

World Conference on Marine Biodiversity

Valencia Spain 11-15 November 2008

Changes in plankton dynamics and biodiversity in the oligotrophic Bay of Calvi (Corsica, Northwestern Mediterranean): response to climate change

Anne GOFFART & Jean-Henri HECQ

University of Liège - Belgium

STARESO Calvi Corsica

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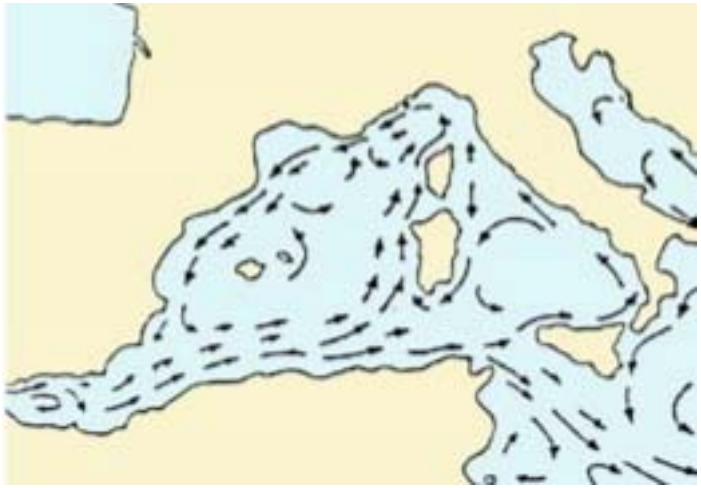

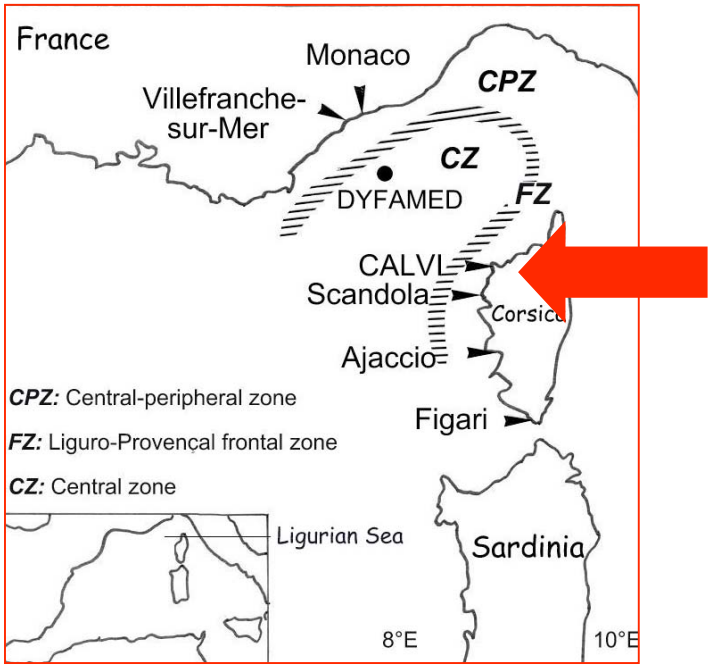

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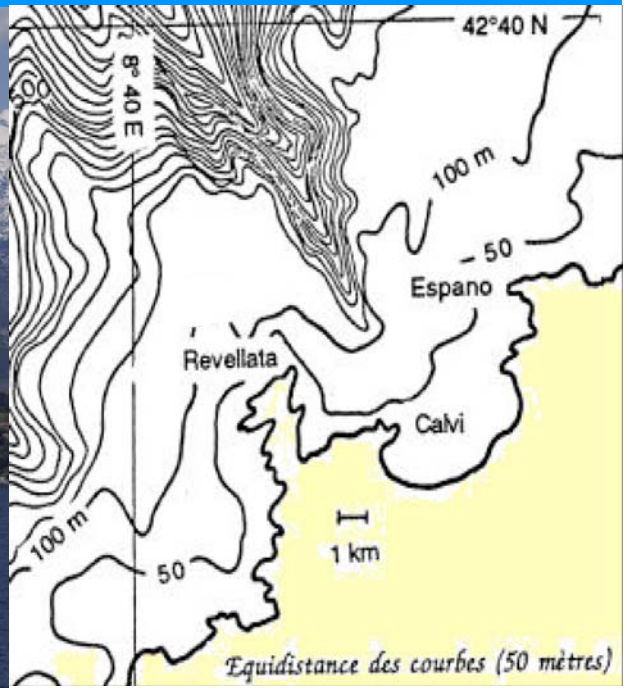
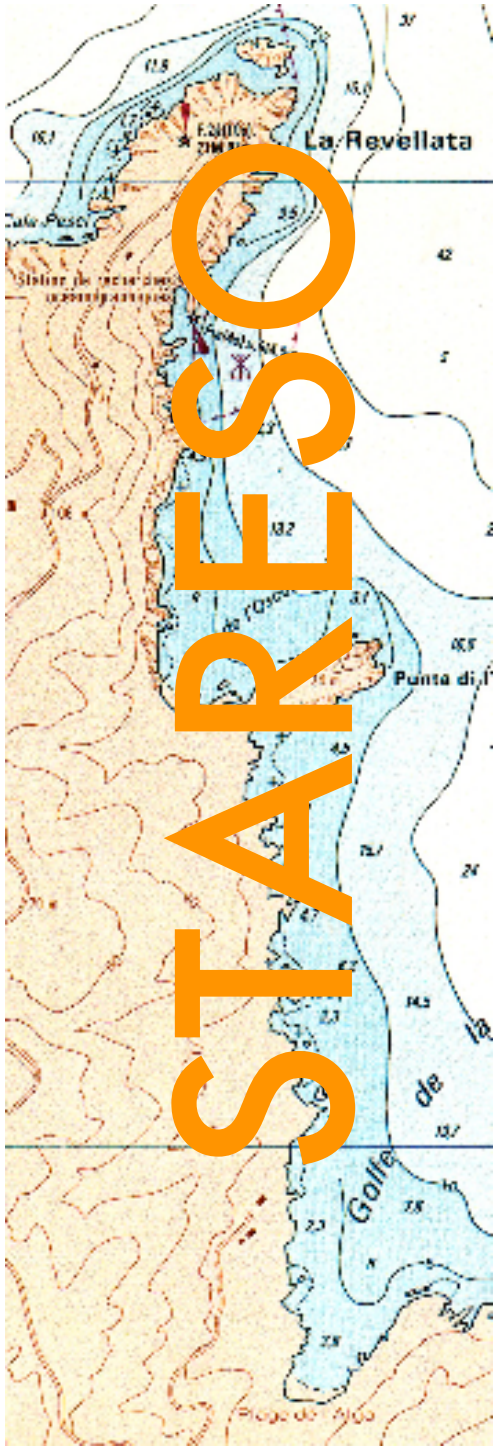
The characteristics of the Bay of Calvi

- Open bay
- Narrow shelf
- Oligotrophic characteristics
- Few anthropogenic forcing
- Reference area for the EU Water Framework Directive





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ULg's marine and oceanographic research station

- Basic sampling
- Long-term series (since 1979)

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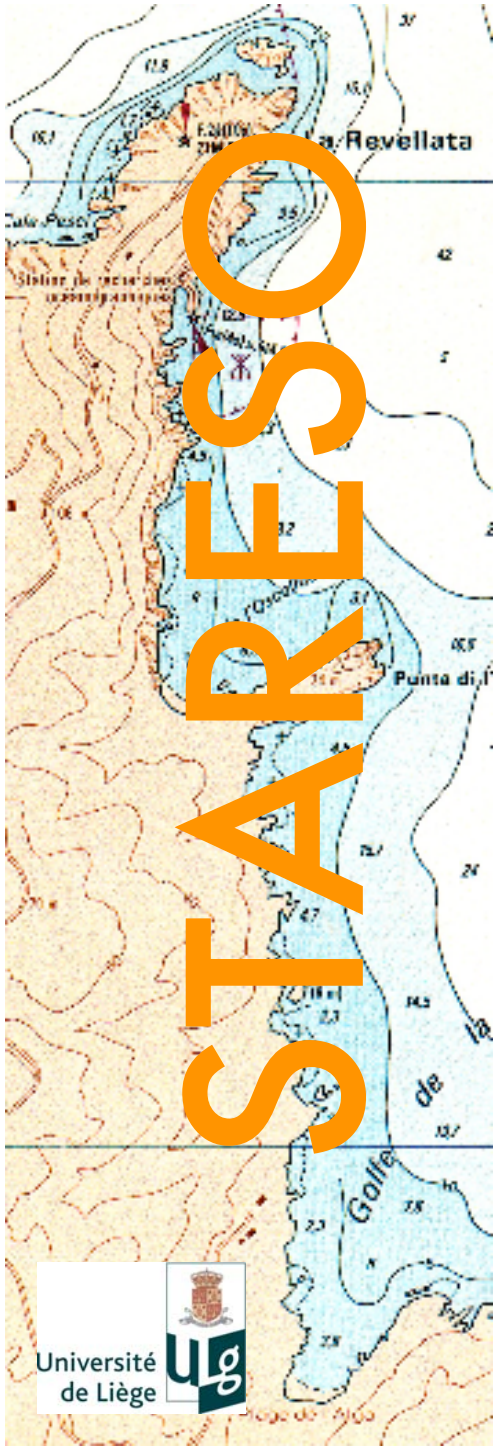

Time-series data

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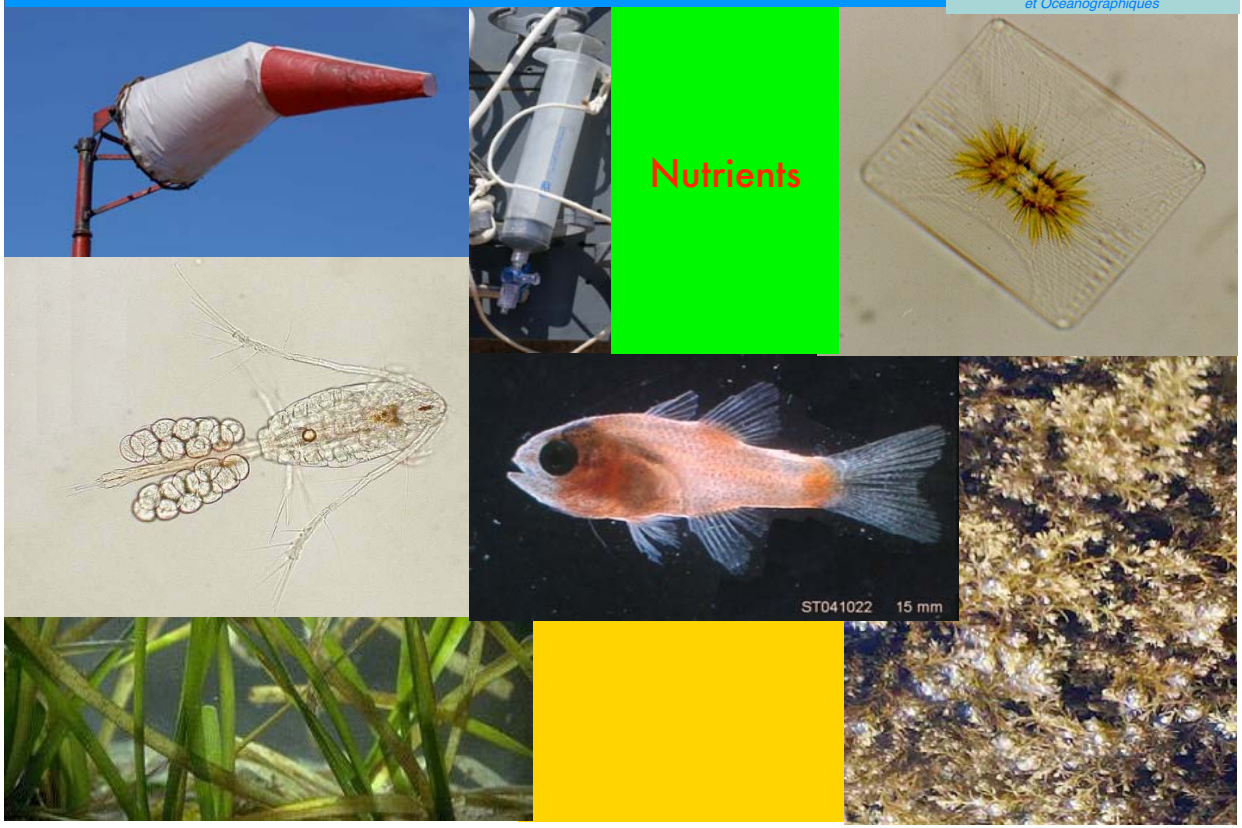
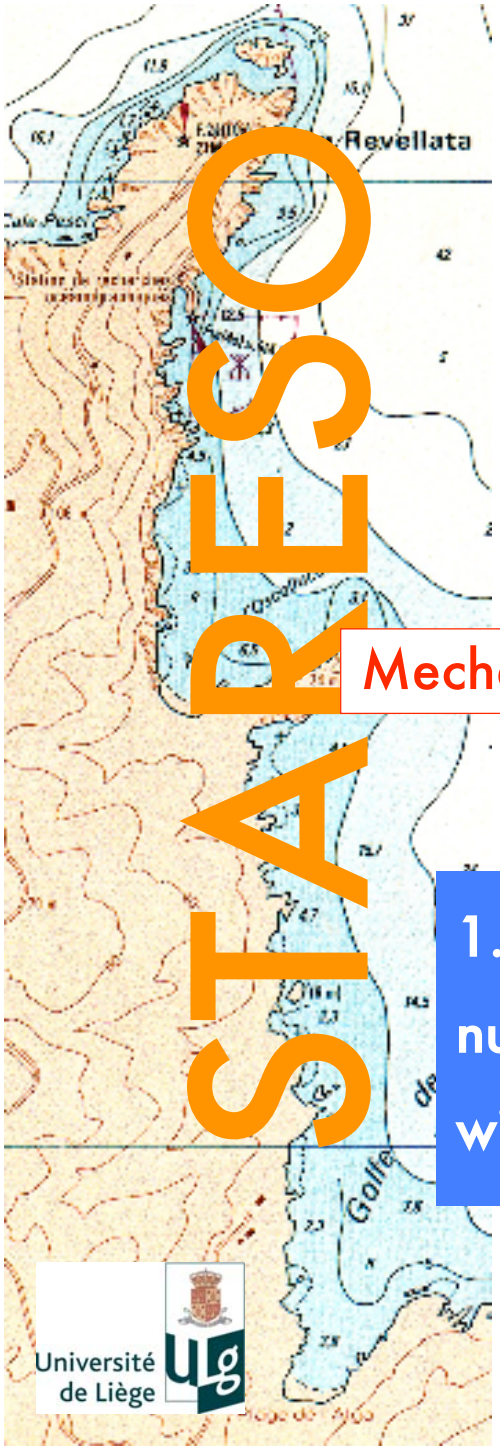


The objective is to examine the interannual variability of the winter - spring plankton bloom in the Bay of Calvi, and along the western Corsican coast, and its control by physical forcing and climate variation



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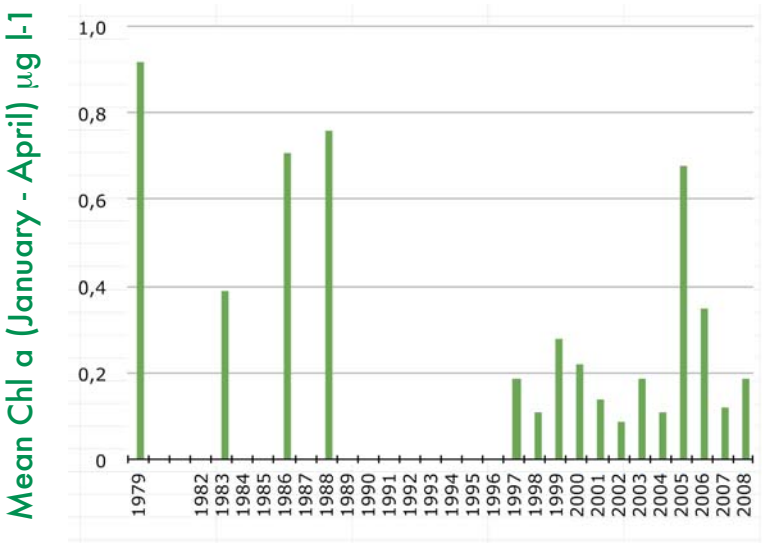
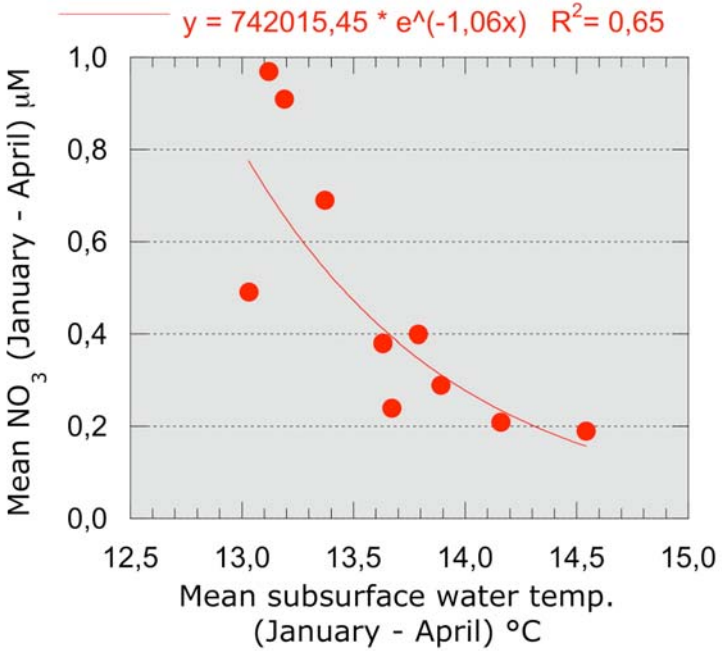


Interannual variations of the winter - spring Chl a concentration in the Bay of Calvi (January - April, subsurface, 1979-2008)

Mechanisms responsible for phytoplankton biomass changes ?

1. Control of surface nutrient enrichment by winter vertical mixing



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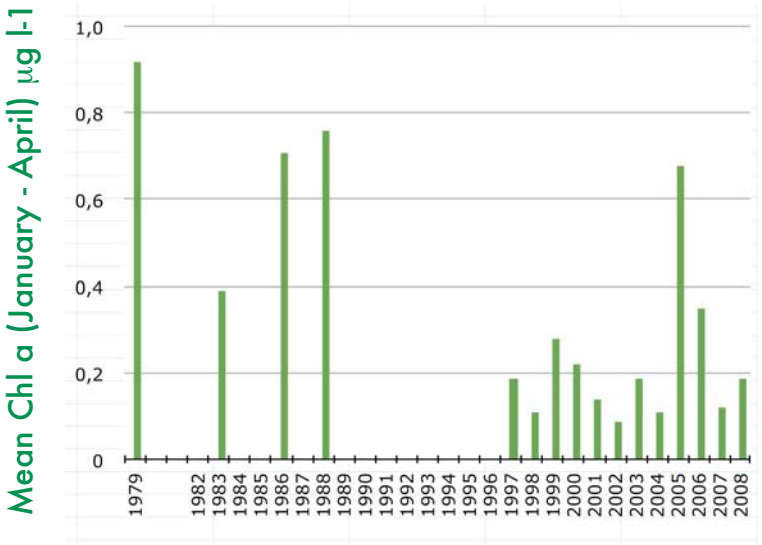
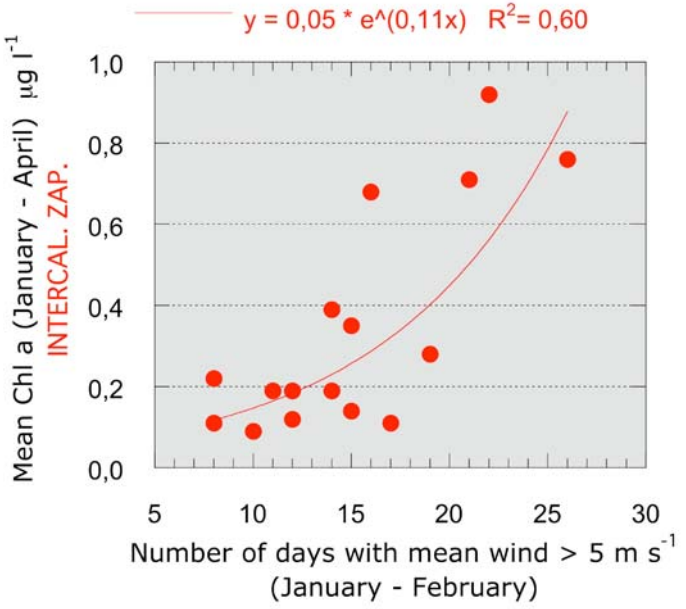


Interannual variations of the winter - spring Chl a concentration in the Bay of Calvi (January - April, subsurface, 1979-2008)

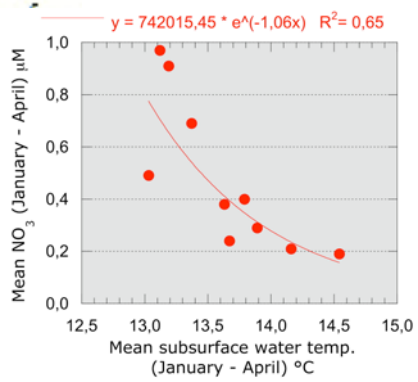
Mechanisms responsible for phytoplankton biomass changes ?

2. Control of phytoplankton production by wind forcing

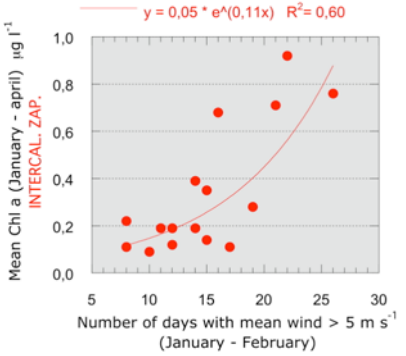


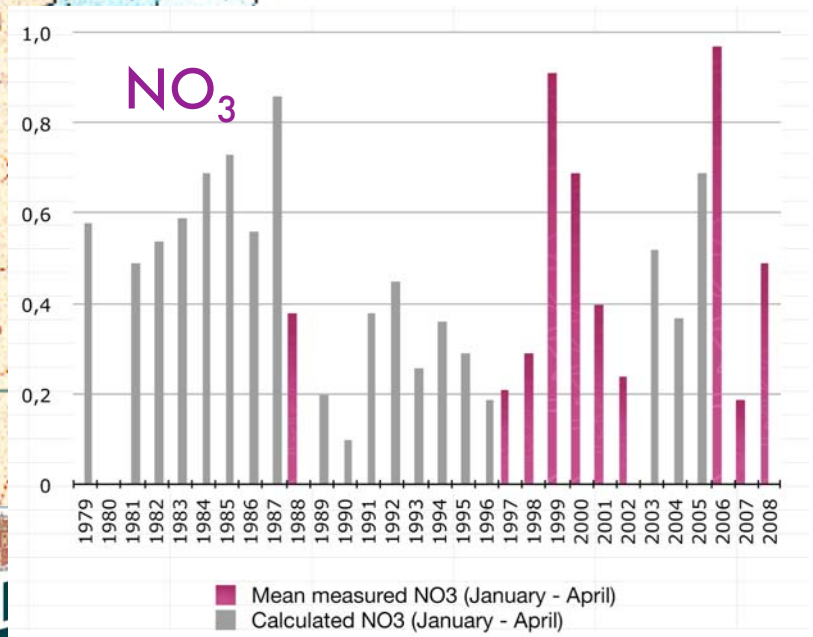
Reconstruction of missing nutrient and phytoplankton data

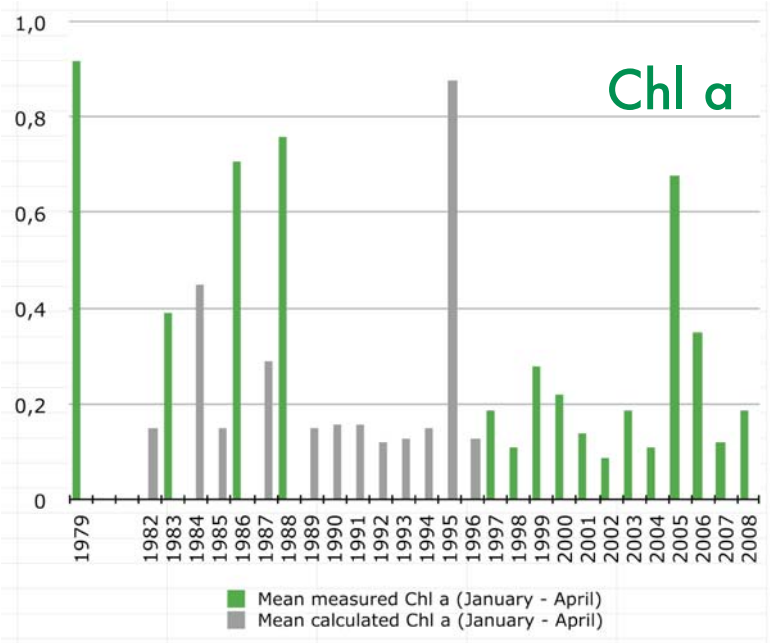
Water temperature / NO_3



Wind stress / Chl a







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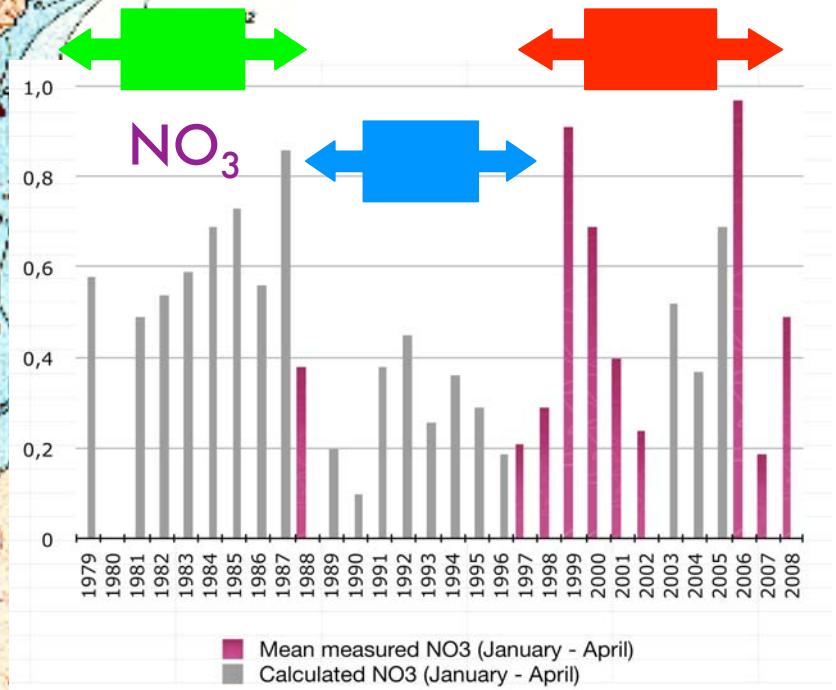
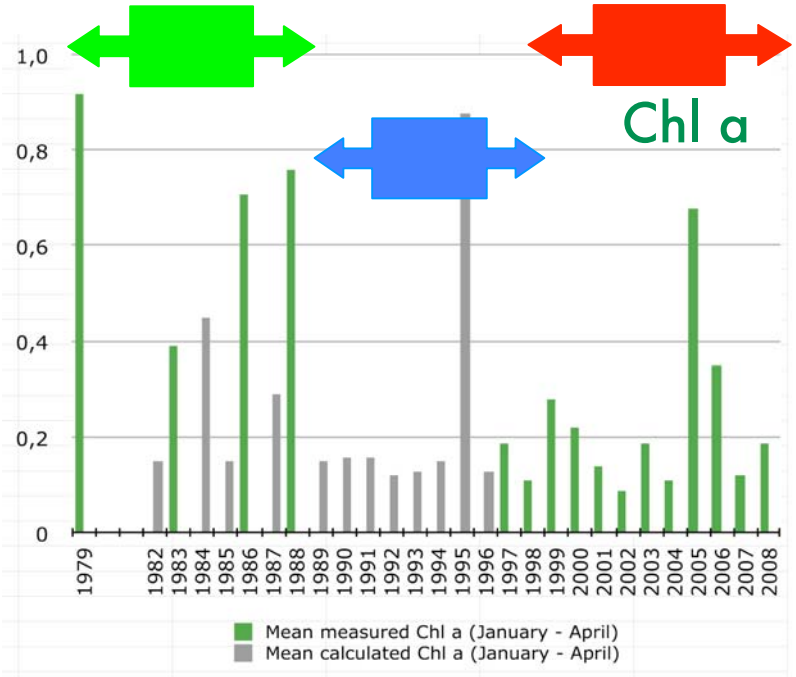
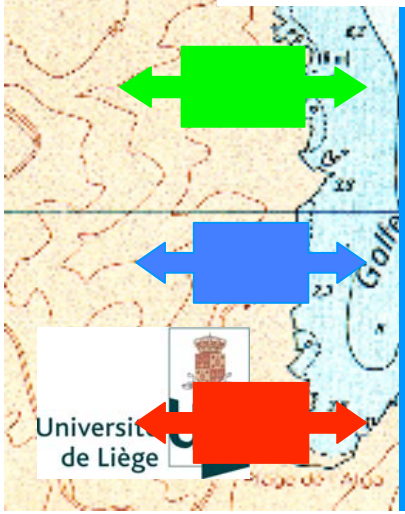
Long-term evolution of nutrient and chl a parameters (January - April)





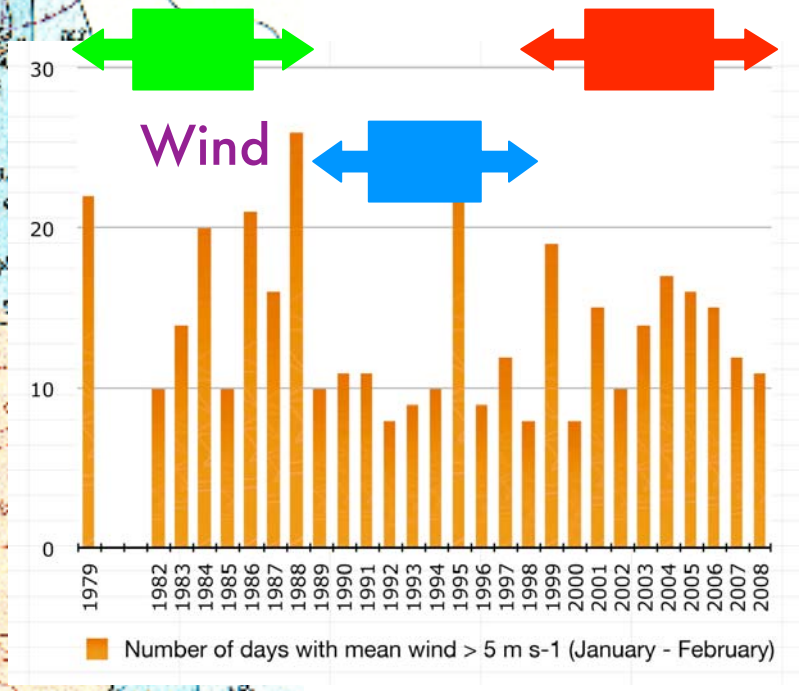


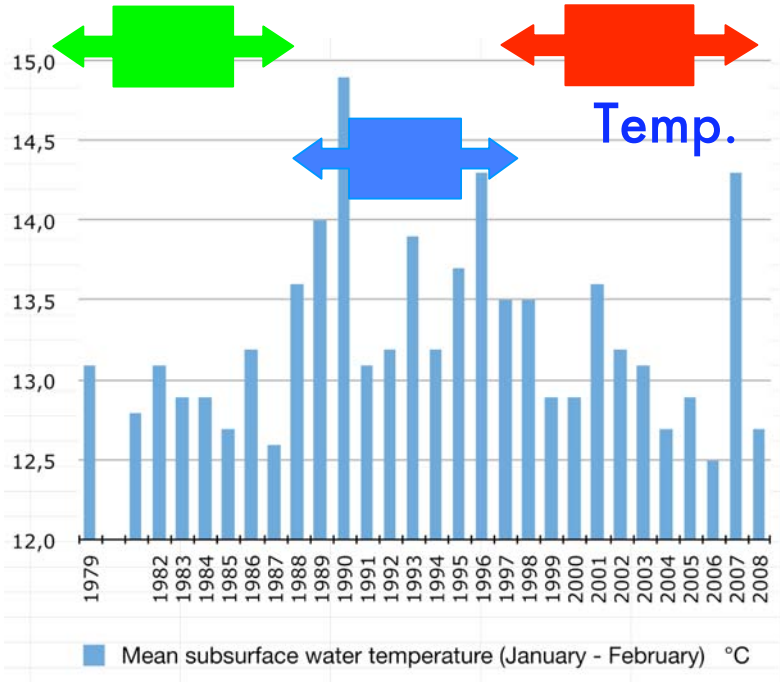
High nutrients, high Chl a, herbivorous food web - BOTTOM - UP CONTROL

Low nutrients, generally low Chl a, changes in the zooplankton communities, increase of thermophilic species, …

High nutrients, generally low Chl a, invasion of *Pelagia noctiluca* and salps - SHIFT TOWARDS A TOP - DOWN CONTROL ?

Long-term evolution of wind stress and subsurface water temperature (January - February)





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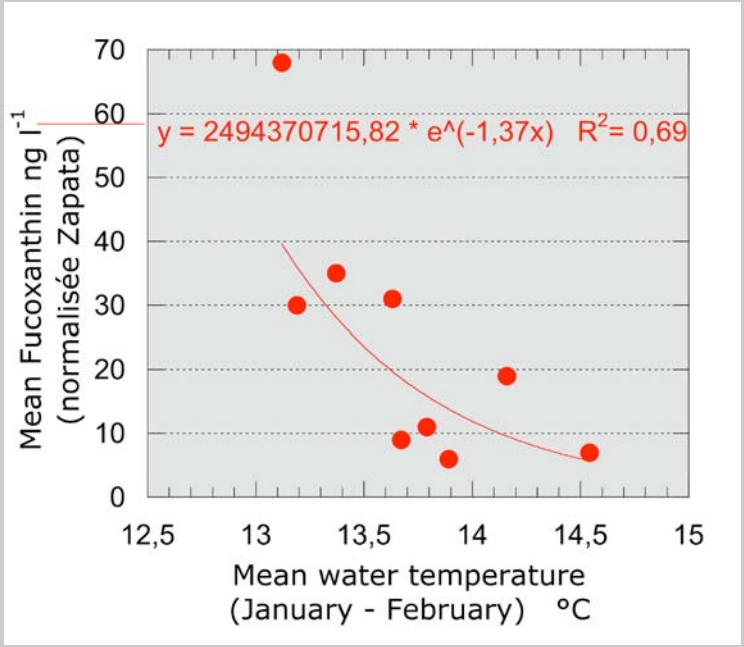
Something more…

There is a need to explore relationship between physical and climate forcings and species composition



Conclusions & perpectives

- The Bay of Calvi is one of the few areas where very specific characteristics can be used to study the responses of marine ecosystems to physical forcing and changing climate
- Major changes in plankton dynamics occured during the last 3 decades suggesting a shift in the functioning of the pelagic ecosystem.
- Large-scale climate variation observed in the nineties has altered the pelagic food-web dynamics through changes in biological interactions
- There is a need to explore the shift in the pelagic communities as well as changes in the abundance of specific taxonomic groups

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Thank you for your attention !

Contact A.Goffart.ac.be

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