

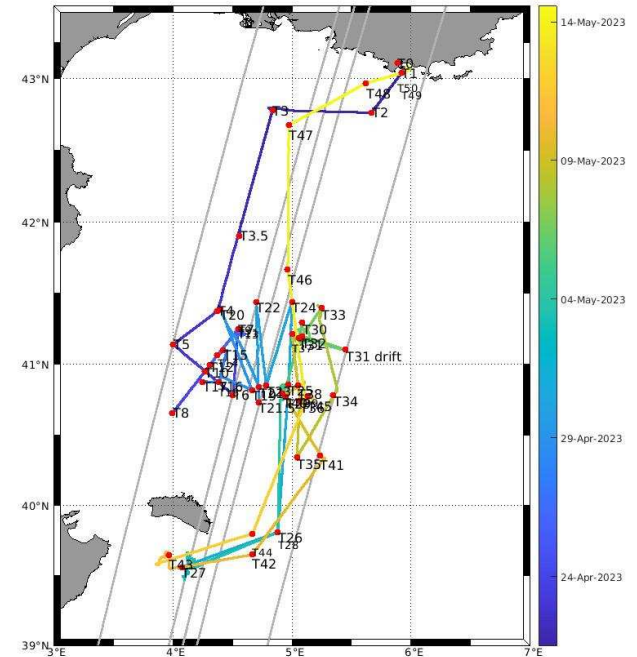
# BioSWOT-Med

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**CRUISE BLOG :** <https://www.swot-adac.org/blogs/bioswot-med/>

# BioSWOT-Med

## Scientific objectives

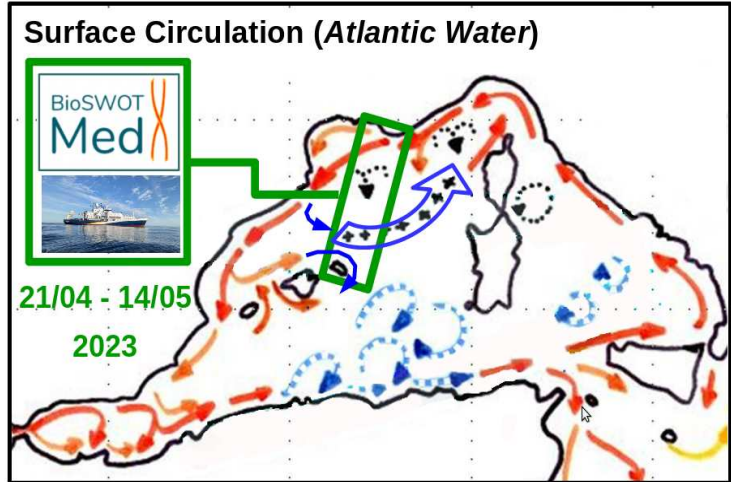
The role of the fine scale circulation as driver of the plankton biodiversity.

Numerical models and preparation compaigns show the structuring role of the fine scale on the planktonic community, but the underlying processes remains poorly understood.

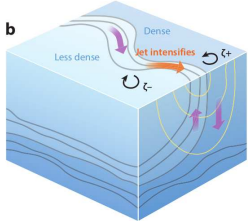
Thanks to numerous multidisciplinary measurements, our campaign aims to improve our understanding of the **coupling of physical processes to biological ones**, from viruses to zooplankton.

We focused on the **NW Mediterranean Sea** where a high biodiversity is associated to conditions of **oligotrophy and moderate energy**.

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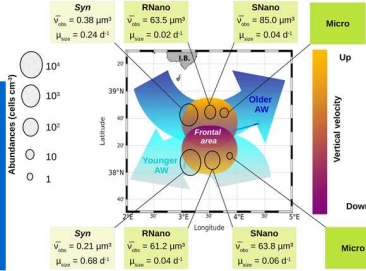


### +++ North Balearic Front



Fronts show complex 3D fine-scale current field [Mahadevan, 2016]...

... and contrasted phytoplankton dynamics [Tzortzis et al, 2023]



# BioSWOT-Med

## Measurements done

An **adaptive and Lagrangian** sampling strategy was applied combined with innovative methodologies allowing to obtain **multidisciplinary measurements** at **high spatio-temporal resolution** in the SWOT swaths.

*Measurements (both ship-based and by autonomous platforms): horizontal and vertical currents, mixing, nutrients and gases, cytometry, plankton nets, omics, incubations, megafauna visual observations and more...*

### BIOSWOT-Med on-board meeting

## Strategy and methodology

SPASSO & MVP, gliders, AUV, drifters & floats, FFADCP, VVP, Cytometry, zooplankton and omics

**« back and forth » strategy  
for the horizontal continuous sampling**

**« Lagrangian » strategy  
for the vertical sampling**

**MVP - Moving Vessel Profiler**  
The resulting multi variable sampling from several depths

FLOATS

ADCP+CTD  
WEIGH

Zonar

b

d

### BioSWOT-Med METADATA



# BioSWOT-Med

## Preliminary results

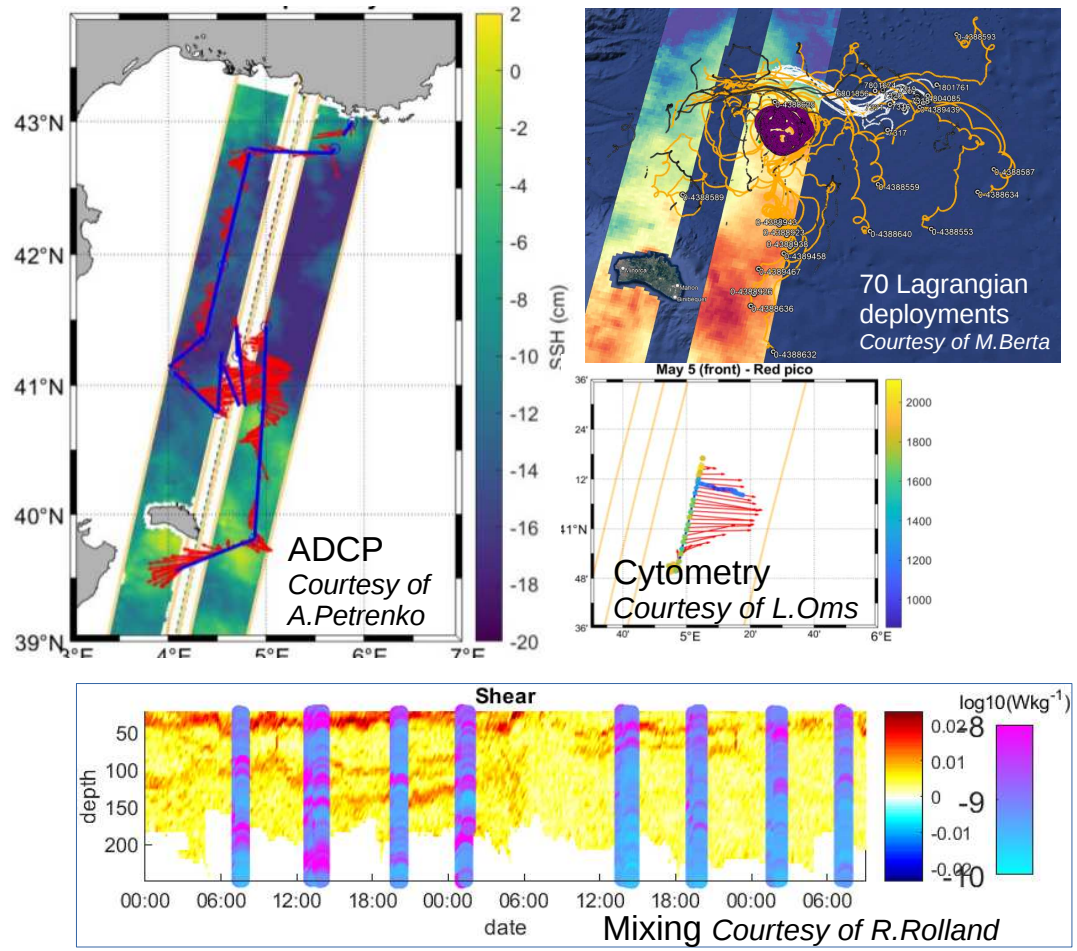
We sampled a **persistent front** between modified Atlantic waters of different ages about 100 km north-east of Menorca. We spent **three weeks** there and explored the fine-scale ocean dynamics and its impact on plankton diversity.

Both sides of the front and the front core were sampled.

The front core was characterized by a **strong and meandering eastward current**; south of it a **strong vortex** was present.

Interesting **contrast** in term on **microbes abundances** were observed between the northern and southern side of the front.

**Two strong wind episodes** impacted significantly the upper layer mixing.



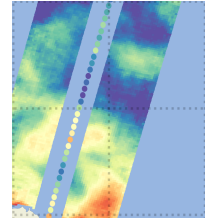
... and numerous other multi-disciplinary measurements!

# BioSWOT-Med

## Future perspectives

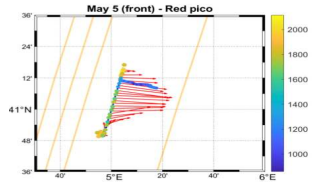
### Remote Sensing CalVal :

- Analysis of the SSH and current velocity in situ data ;
- Comparaison with SWOT and other altimetry dataset (CryoSat and AVISO) ;
- Focus on vertical velocity (Omega equations vs direct in situ measurements).



### Physical-Biological Coupling :

- On land analysis of physical, chemical and biological data ;
- Estimation of the biodiversity, nutrients fluxes, zooplankton grazing ;
- Study of the fine-scale processes in the oligotrophic and moderately-energetic ocean.



### Oceanography and climate :

- Reconstruction of the physical and biogeochemical seascape during the cruise ;
- Projection at the regional (NW Mediterranean Sea) and decadal scales.

