

# Characterization of zooplankton and marine snow dynamics in the Atlantic: insights from three BGC-ARGO floats equipped with Underwater Vision Profilers.

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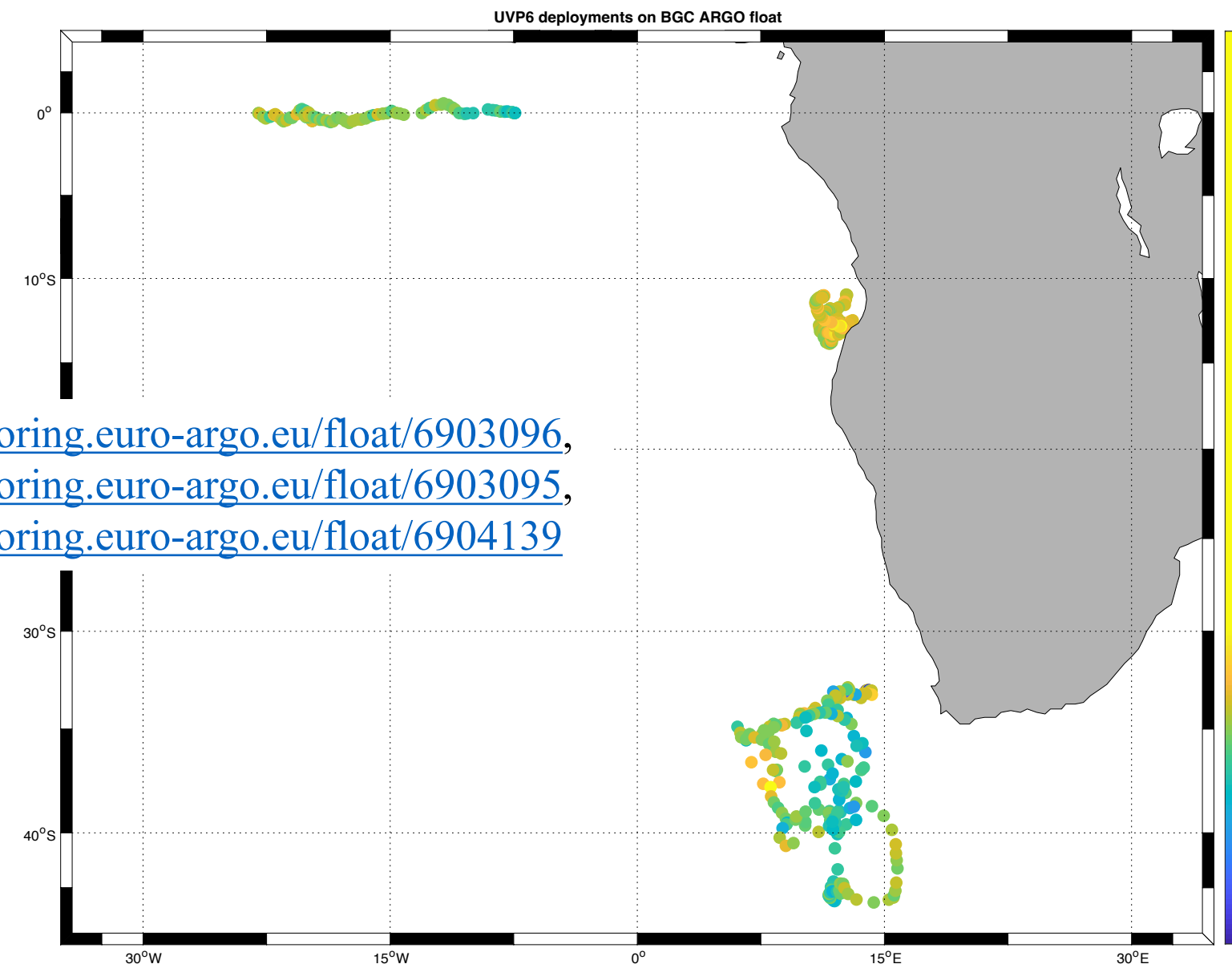
## Scope

Three BGC Argo floats equipped with Underwater Vision Profiler 6 were deployed in the Atlantic to study plankton and marine snow to understand the spatial and temporal dynamics in key variables for the strength of the Biological carbon Pump.

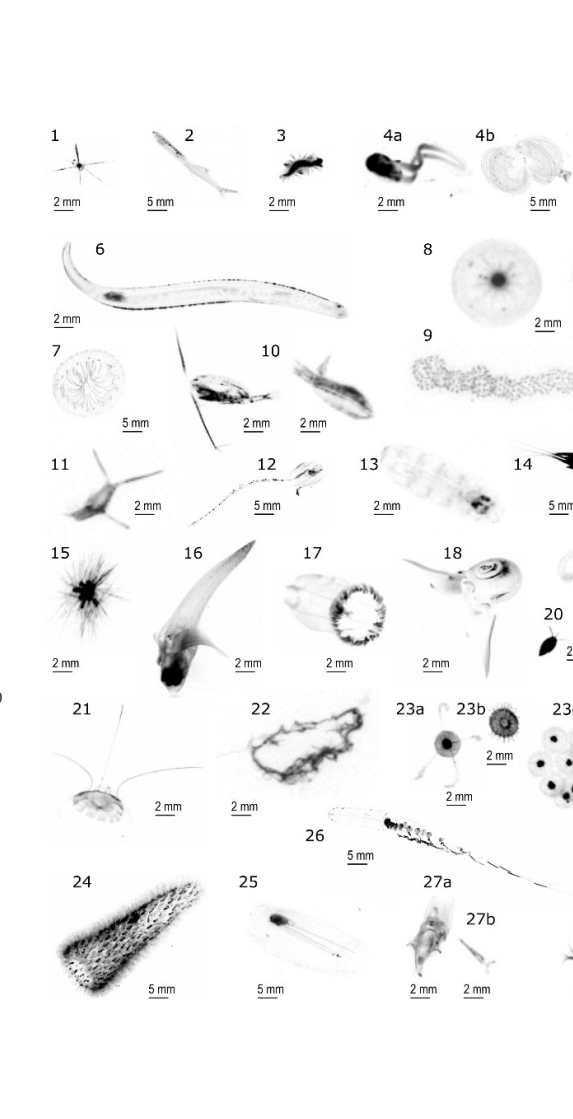
## Methods

The floats were recovered after ap. 1.5 years each. All images (>300 000) were recovered and classify with supervised and non-supervised methods (plankton taxa in 50 categories and particle morphologies in 4 types of marine snow).

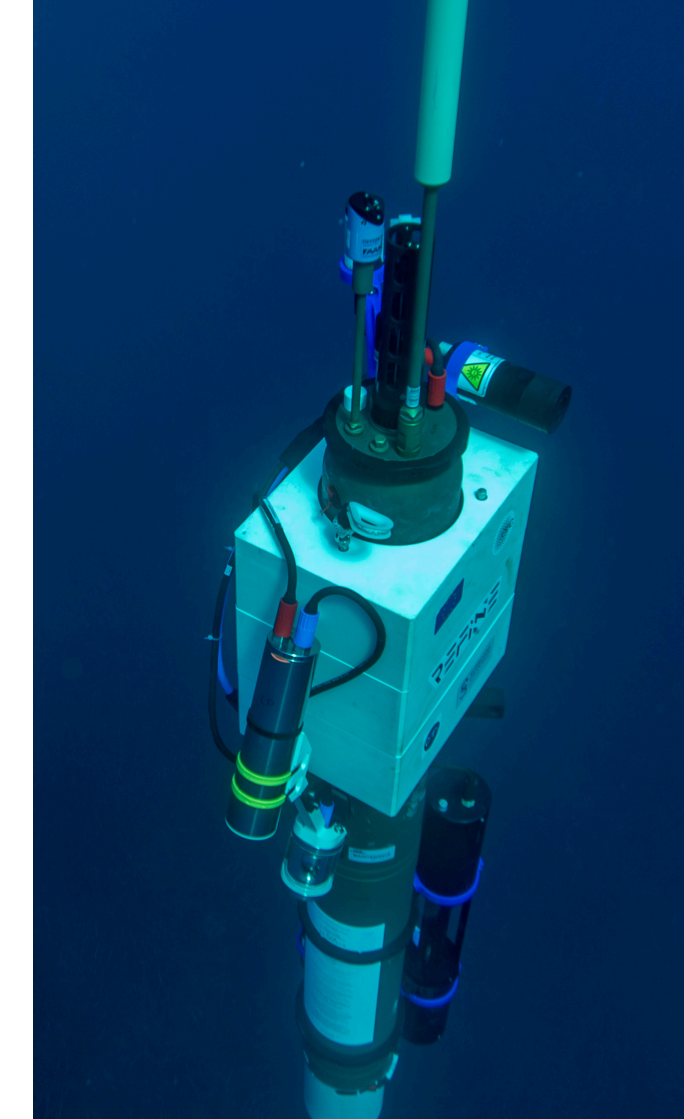
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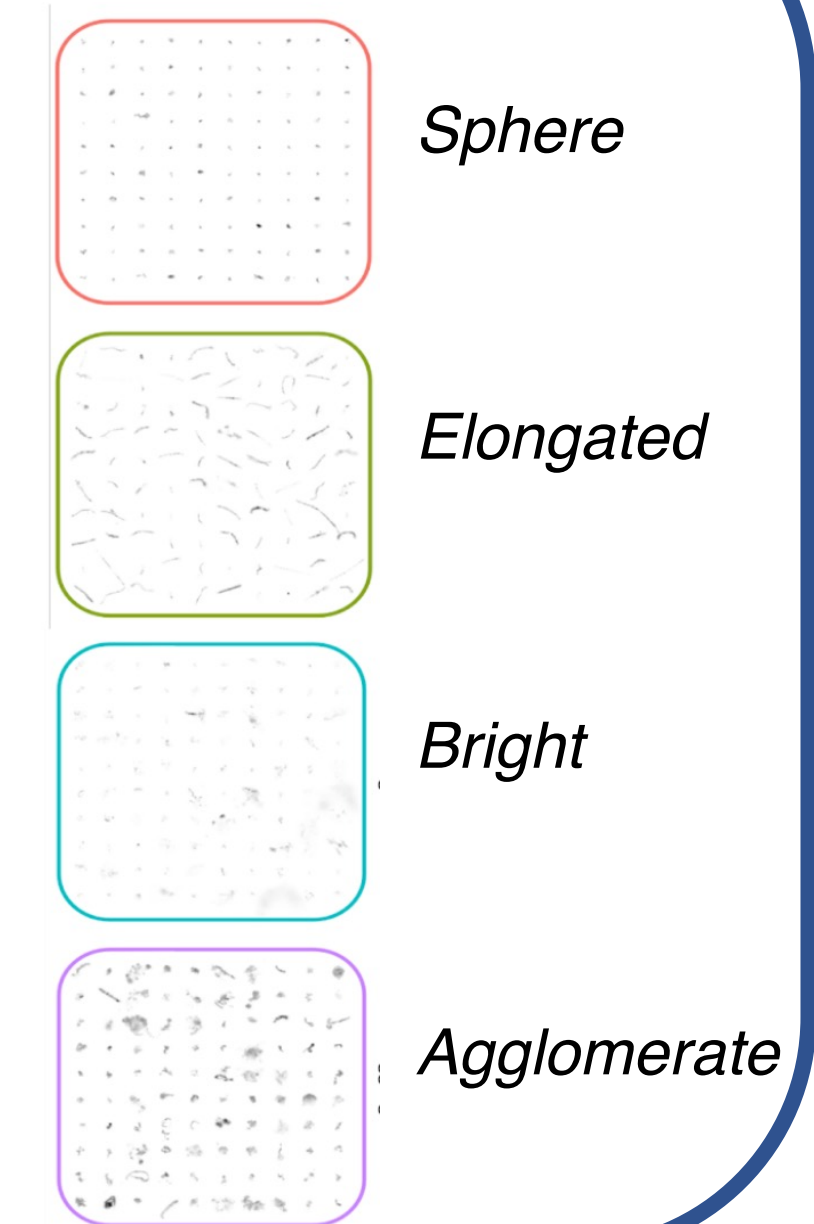
## Plankton



## UVP6 on float



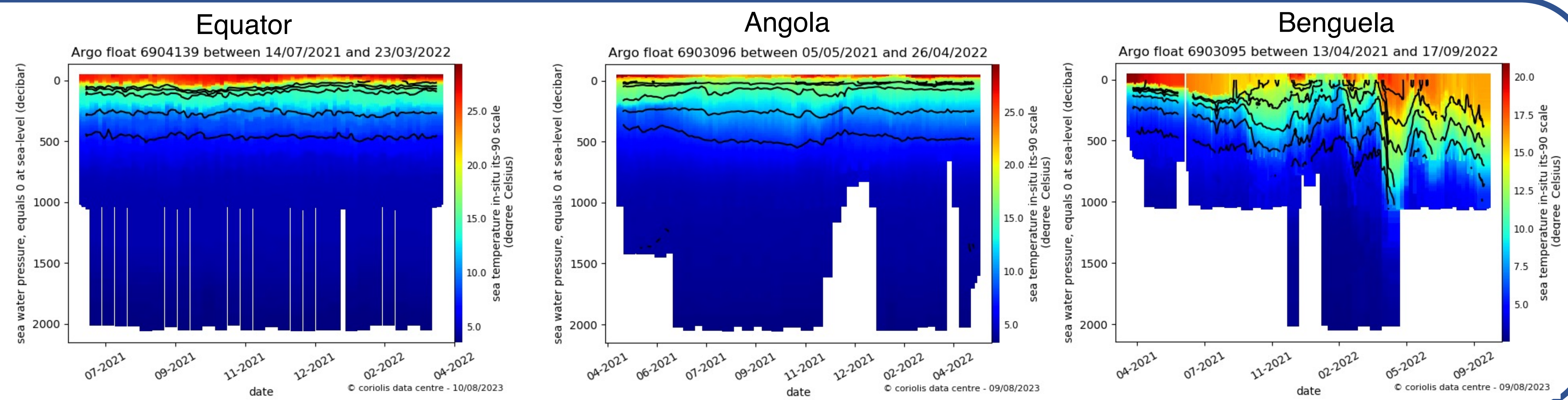
## Marine Snow



Trudnowska et al., 2022; Panaiotis et al., 2023; Stemann and Boss (2012); Picheral et al., (2020)

## Planktonic Habitat

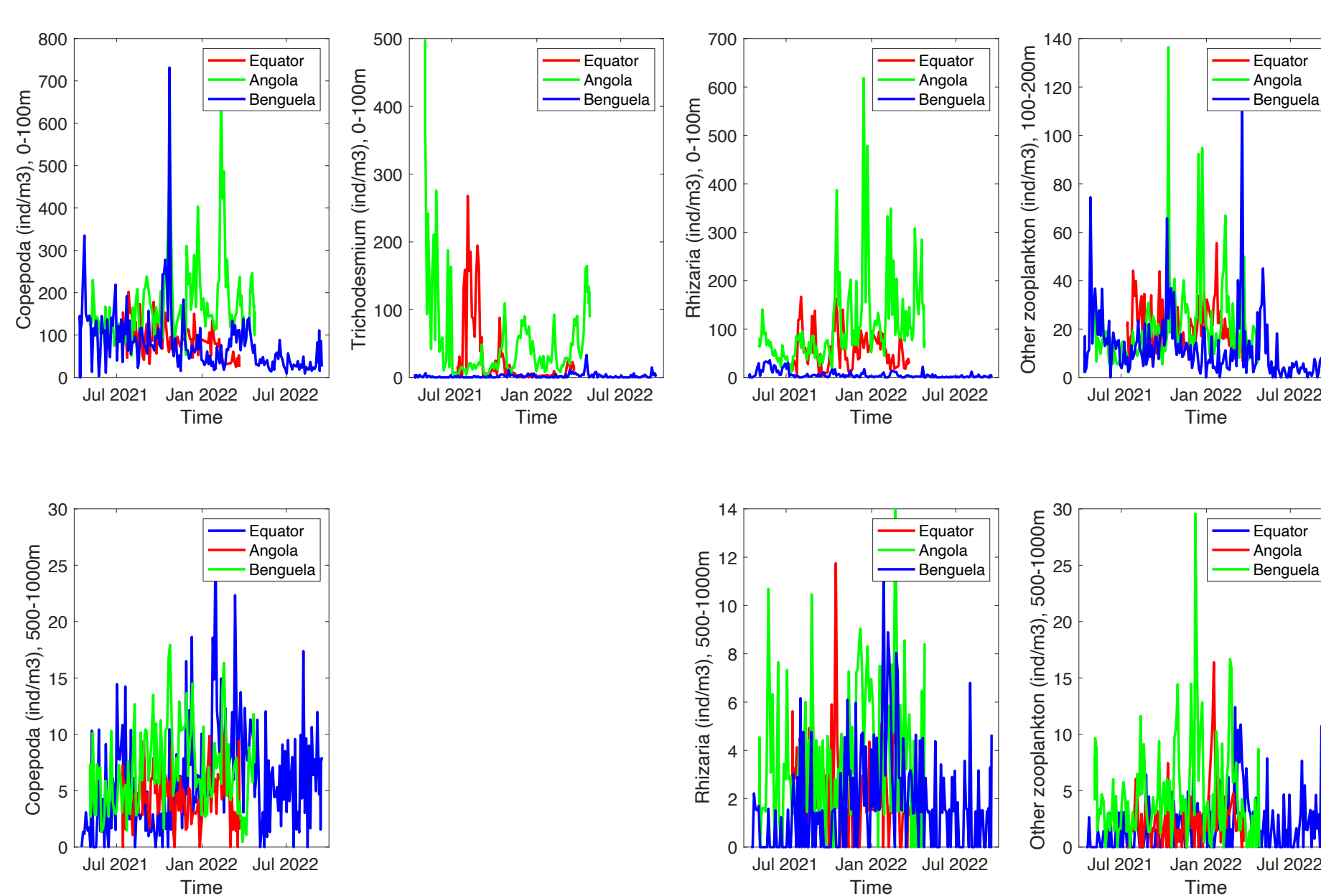
The floats deployed at the Atlantic equator and showed weak horizontal and temporal gradients in temperature. In the Angola basin, rising of isotherms was the signature of upwellings. In contrast, the float in the Benguela basin showed important changes of temperature as the float was entrained in the circulation between cyclones and anticyclones.



## Plankton and marine snow community composition

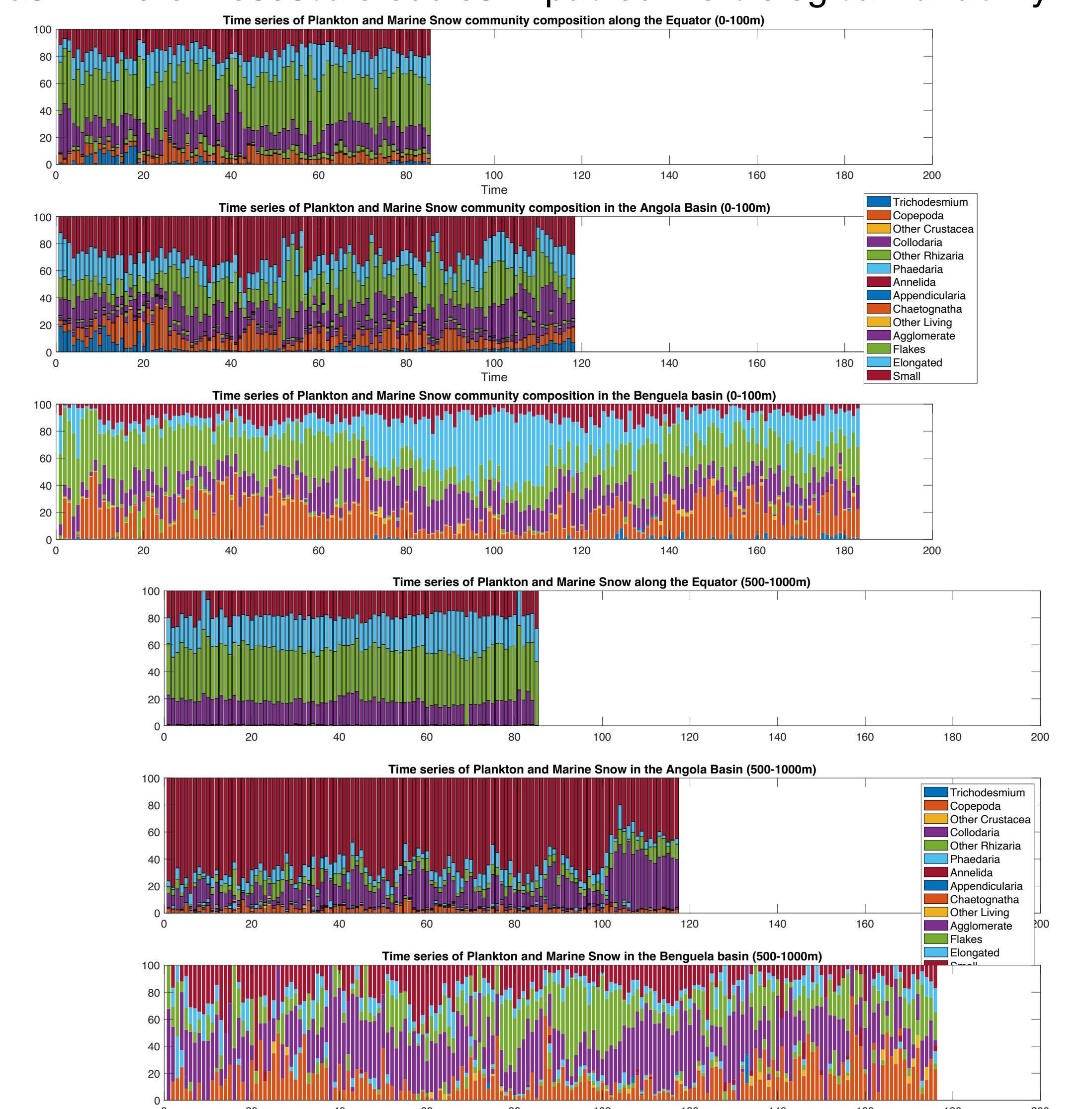
The three main plankton categories were, **Trichodesmium**, **Copepoda** and **Rhizaria**. Time series in the 0-100m layer showed distinct patterns in the three basins:

- Higher concentrations and strong peaks of Copepoda and Rhizaria in the Angola basin than at the Equator or Benguela basin
  - Strong peaks of Trichodesmium at the Equator and in the Angola Basin
- Time series in the 500-1000m layer showed less distinct patterns in the three basins and lower concentrations than in the upper layer.



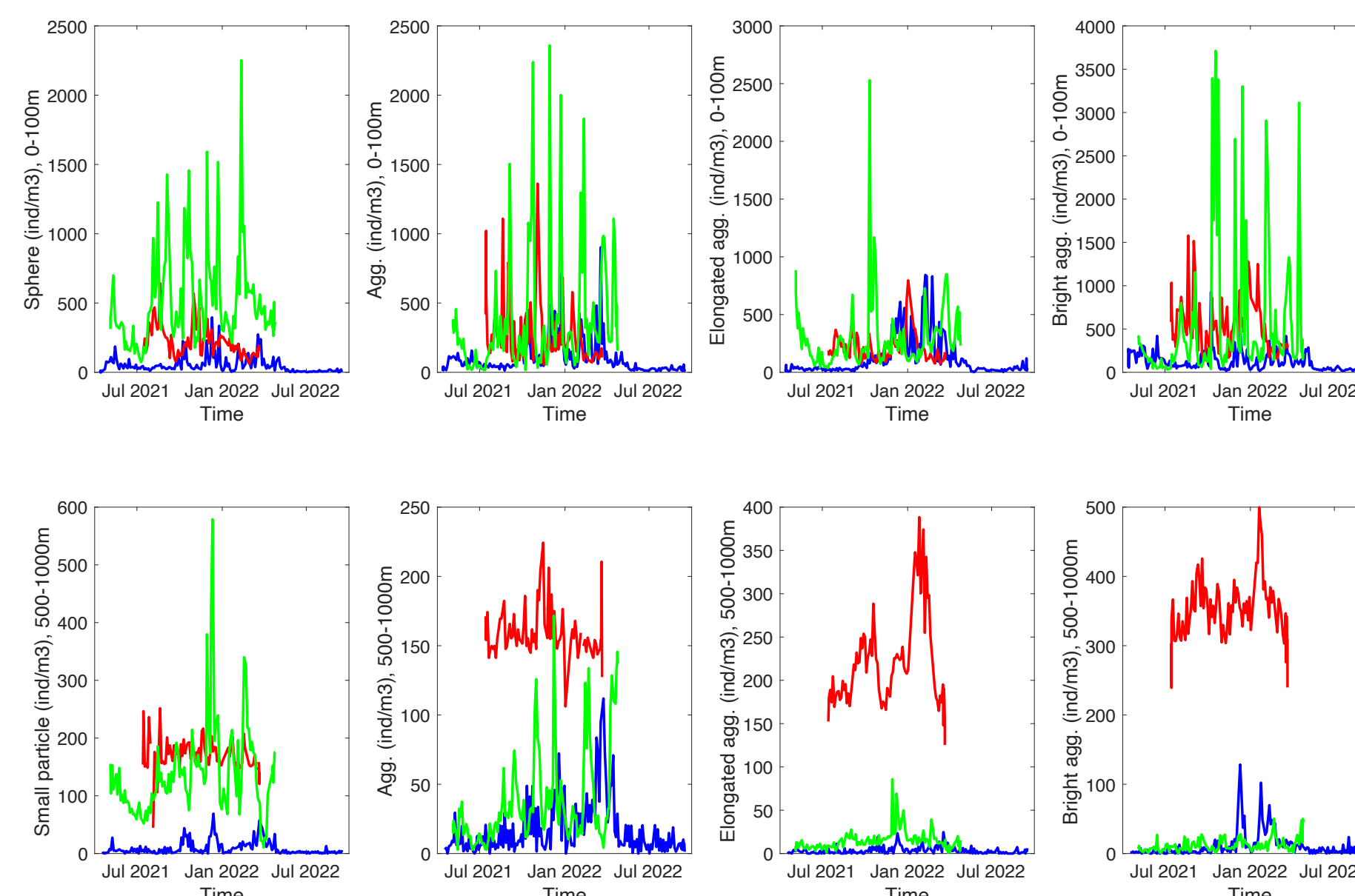
Time series of the community structure of plankton and marine snow showed distinct patterns in the three basins:

- Among plankton, Copepoda, Trichodesmium and Rhizaria were dominant in the epipelagic layers respectively in the Benguela, Angola and Equator
- Among marine snow, Elongated, Spheres and Flakes were dominant in the epipelagic layers respectively in the Benguela, Angola and Equator
- Plankton contribution to total count was low in the mesopelagic apart in the Benguela basin where mesoscale eddies impacted the biological variability.



Time series of Marine Snow showed distinct patterns in the three basins:

- Higher concentrations and strong peaks of all morphotypes of marine snow in the Angola basin during upwelling events than at the Equator or Benguela basin at surface and in the mesopelagic
- Higher concentrations of all types of marine snow in the equatorial mesopelagic relative to the other sites.
- Mesopelagic peaks of marine snow reflected surface intermittent production events.



## Bibliography

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