## 3<sup>rd</sup> Weekly Report M208, Mindelo-Mindelo

24.2.-2.3.2025



The third week of Meteor cruise M208 focused on our section work in the southern part of the Senegalo-Mauritanian upwelling system. This upwelling system is driven by seasonally intensifying winds as well as turbulent mixing on the shelf. According to our original working plan, we had planned sections at 11°N, off Guinea-Bissau; at 14°30'N, just south of Dakar; and at 18°N, off Mauritania.

The 11°N section began last Sunday with CTD stations to measure hydrography, nutrients, chlorophyll, and particles, as well as to collect water samples. These samples were used not only for additional biogeochemical analysis on board and later in the lab at home but also to prepare incubation experiments to study nitrogen fixation and biological productivity. Other measurements along the section included water sampling for trace metal analysis and net catches using different types of plankton nets. On the shelf and continental slope, we conducted enhanced profiling with a microstructure probe to measure turbulence induced by breaking internal waves. These internal waves, generated by tide-topography interactions at the continental slope, provide the energy for the upward mixing of nutrients on the shelf, fuelling high productivity. Indeed, extremely high abundances of different types of phytoplankton were measured on the shelf off Guinea-Bissau despite weak winds in the southern part of the Senegalo-Mauritanian upwelling system.

When we completed the 11°N section on Thursday, we still had not received diplomatic authorization to conduct measurements in Senegalese waters. As a result, we had to shift the planned section from 14°30′N to 13°30′N, placing it within the exclusive economic zone of The Gambia, for which authorization had been granted. While we were in the middle of our section work off The Gambia, the authorization for Senegal arrived as well.

We would like to express our gratitude to the German Embassy and the Federal Foreign Office for their great help in securing permission to conduct measurements in Senegalese waters. This authorization will enable us to complete our section work in Senegal and, in particular, to continue our underway measurements of atmospheric parameters, such as aerosols, Saharan dust, and wind. While we have already encountered some Saharan dust during our cruise, we still hope to measure higher air concentrations during our northward transit.

Although we enjoyed warm tropical weather at 11°N, with temperatures reaching 25°C, conditions in the coastal upwelling system were often relatively cool, sometimes dropping below 18°C. In addition to the pleasant weather conditions, our scientific cruise participants—who this time are predominantly vegetarian—particularly appreciated the excellent selection of food, with plenty of fresh salads, vegetables, and fruits. A big thank you to the galley!

Greetings from the tropics,

Peter Brandt and the participants of Meteor cruise M208



**Fig. 1:** Measurements along the 11°N section off Guinea-Bissau: Zonal velocity toward the east is shown in red, while westward velocity is in blue. Meridional velocity toward the north is marked in red, and southward velocity in blue. The velocity field reveals the broad northward flow of the Mauritania Current and the equatorward jet on the shelf (Figure Alexandra Andrae).