

RV SONNE

SO285 „TRAFFIC 2“

Emden - Emden, 20th August - 2nd November 2021

11. Weekly report

25th - 31st October 2021



This week we traveled from Las Palmas on the Canary Islands to Emden, our port of destination. The longest voyage of the RV SONNE so far is now coming to an end. Hence, this is the last SO285 weekly report and time for a group picture (see Figure 1), summarizing our preliminary results and in particular to thank captain Oliver Meyer and his crew for their excellent support during the cruise.



Figure 1: Participants of the RV SONNE cruise SO285

Picture: Solvin Zankl

Cruise SO285 is the second field campaign of the BMBF-funded joint project TRAFFIC (Trophic TRANSfer eFFICIency in the Benguela Current). In contrast to the first TRAFFIC cruise with RV Meteor (M153) during the austral summer/autumn in 2019, cruise SO285 took place during the austral winter/spring of the year 2021. The overall aim was to capture ecosystem responses to seasonally varying physical conditions in order to better understand and predict e.g. climate change impacts on fisheries and CO₂ sequestration in the Benguela Upwelling System (BUS).

First results partly confirm our expectations but hold also some surprises. For example, the upwelling source waters were more oxygenated during our current cruise than during M153, which may have been caused by the winter mixing of the water column. Furthermore, similar to M153, the plankton samples showed a pronounced heterogeneity with a species composition that changed with increasing distance from the coast, and that differed also between the BUS regions.

However, we were particularly surprised by the observation that, contrary to our expectations, productivity in the northern part of our study area (NBUS) was nearly as low as during the summer/autumn cruise M153. In addition, we found masses of jellyfish of the species *Chrysaora fulgida*, while there were almost no mesopelagic fish in our nets.

In the southern part of our study area (SBUS), the situation was somewhat different. Here, the system was overall more productive and characterized by an increased occurrence of salps. At the same time, we found hardly any sardine larvae. However, mesogelagic fish of the species *Maurolicus walvisensis* were abundant.

These observations support our TRAFFIC hypothesis, in which we postulate that "dead end" species such as jellyfish and salps are of different importance in the NBUS and SBUS, and displace fish from their ecological niche. This could be true for jellyfish and fish in the NBUS, and for salps and sardines in the SBUS. However, due to the high spatial and temporal variability of these systems, the data density is too low to prove such trends. Nevertheless, we have made these observations and are now interested in investigating possible causes and effects of such changes in ecosystem composition on the marine carbon cycle. For this purpose, we will evaluate our underway measurements in combination with high-resolution nutrient profiles and the results from our drifting and moored sediment traps as well as satellite data.

RV SONNE, at sea, 50°N / 1°W, 30th October 2021

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