RV SONNE

Cruise SO285 „TRAFFIC 2“

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

9. Weekly report

11th - 17th of October 2021

After more than three weeks of intensive station work with 154 stations in total and 440 instrument deployments, our measurement mission in the Benguela upwelling system already ended on Sunday, October 10th, with the arrival of RV SONNE in Walvis Bay. Thus, this week was dominated by the wrap-up of the last stations and clean-up, as well as a look back at the last day of our field work. On this day, Luisa Meiritz and the crew recovered and re-deployed our long-term sediment trap system. It is located in an area specially reserved for research near the entrance of the Walvis Bay harbor. To avoid conflicts with fishermen, this area is officially marked on the nautical charts. The special feature of this position is its proximity to the coast, which allows us to study the impact of the land on the marine ecosystem.

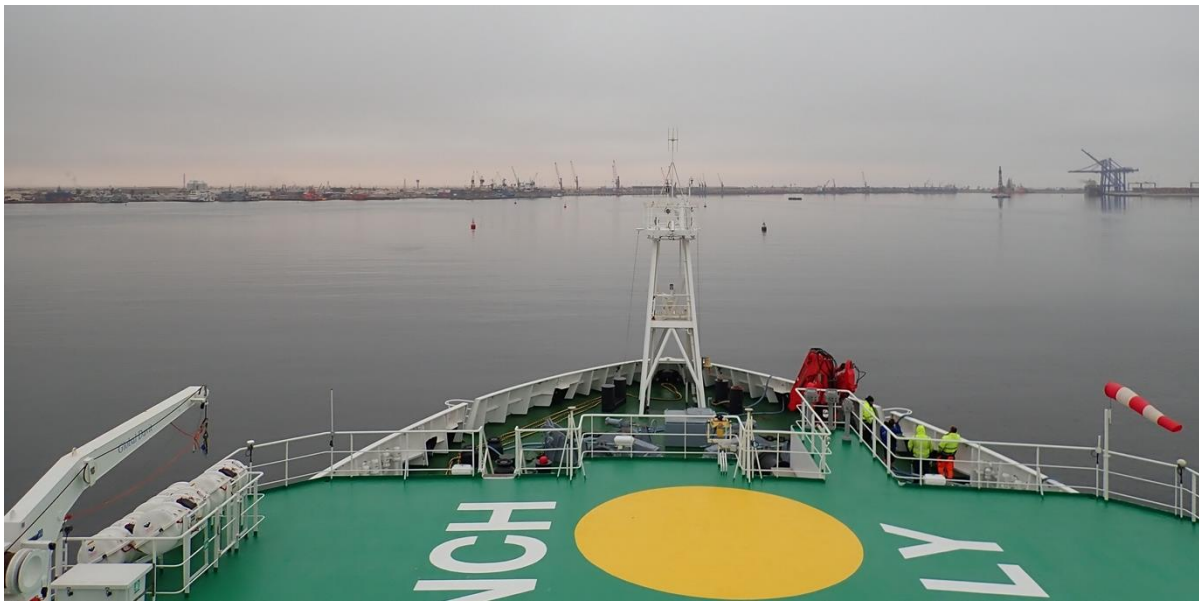

Figure 1: Walvis Bay in coastal fog *Picture: Julia Plewka*

Walvis Bay is located at the edge of the Namib Desert, in the delta of the Kuiseb River, at a small bay frequented by many birds. Coastal deserts comparable to the Namib are found along all major upwelling systems, because the cold upwelling water cools the air reducing moisture transport from ocean to land. The results are coastal fog and drought on land (see Figure 1). Despite the lack of water, however, Namibia has a number of rivers such as the Kuiseb or the Omaruru Rivers just north of Walvis Bay, that cross the Namib and end at the shore (see Figure 2). Unlike the rivers we are familiar with, Namibia's rivers are dry rivers that very rarely carry water. They function as air jets, where wind is channelised and accelerated, stirring up fine river sediments and carrying them as dust far out into the open sea. Based on these dust plumes, river mouths can be clearly identified on satellite images (see Figure 2).

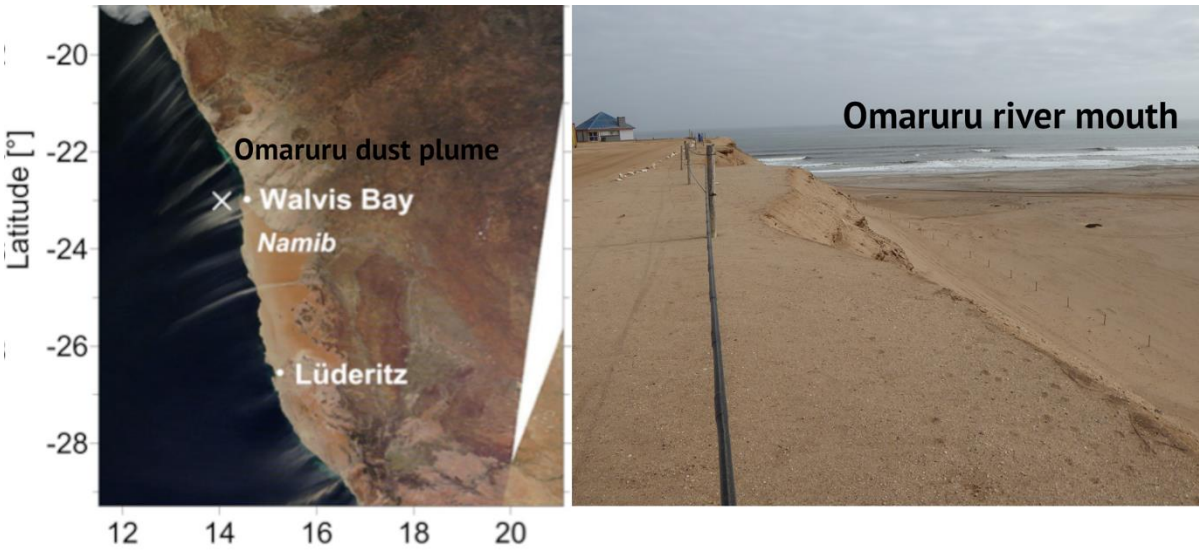

Figure 2: Left: Satellite image (MODIS TERRA) showing the dust plumes of the individual dry rivers along the Namibian coast. The cross marks the approximate position of our long-term sediment trap mooring. Right: mouth of the Omaruru River. Picture: Tim Rixen

About 30% of the material we found in our sediment trap off Walvis Bay consists of this dust. It carries minerals that are crucial for the growth of plankton and the functioning of the biological carbon pump in the ocean. For plankton, they bring essential trace minerals like iron while acting as ballast material within the biological carbon pump. Imagine that the plankton is loaded with small stones. This causes the plankton and – with it – the CO_2 stored in its biomass to sink faster into the deep ocean, where the CO_2 can no longer be exchanged directly with the atmosphere. This process and its dependence on global changes is another important topic, that we will work on in the coming weeks using the data obtained during this cruise.

RV SONNE, at sea, 2°S / 9°W, 17th of October 2021

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