



## Second weekly report of *RVPoseidon* Expedition POS 533 - AIMAC

### Atmosphere-Ocean-Islands-Biogeochemical Interactions in the Macaronesian Archipelagos of the Cape Verdes, the Canaries and Madeira (04.03.-10.03.2019)

#### Mindelo (Kap Verden) - Las Palmas (Gran Canaria) - Funchal (Madeira) - Las Palmas

After we finished our station work near the islands of Boavista and Sal on Monday evening, we used the crossing to the north side of the island of Sao Vicente for a small costume party, where Melchor and Magdalena won the prize for the best costume. They showed the ocean in a healthy state with many different organisms and in a "high CO<sub>2</sub>" world where jellyfish dominate biodiversity. The nightly radiosonde, to measure the boundary layer dynamics, was started in teamwork by Jesus and a zebra (Fig. 2), but after all the strange figures had disappeared the next morning, the work continued as usual.



**Fig. 1:** Magdalena and Melchor show the oceans condition in climate change in a high CO<sub>2</sub> world.

A flat surface station up to 150 m water depth in front of the - CVAO (Cape Verde Atmospheric Observatory, Fig. 3.), then a final deep sampling from 3500 m water depth at the time station CVOO (Cap Verde Ocean Observatory) of GEOMAR, and

then we started the transit to the Canary Islands. On the way, 3-hourly water and air samples were taken from the surface as usual, which were immediately investigated in the laboratory for trace gases, nutrients and phytoplankton (Fig.4).



**Fig. 3:** Sao Vicente with the Atmosphere Observatorv CVAO.

up and down, being abruptly slowed down or accelerated. Although it is quite exhausting, we have almost become accustomed to the endurance gymnastics, as the ship movements require permanent balancing and balance, whereby one or the other bruise cannot be avoided, since some movement still comes as a surprise. Spectacular images of ocean dynamics were also possible in the last few days (Fig.5).

The weather forecast was good and we were optimistic that we could do the 700 nautical miles in about four days and reach our first station in Spanish waters during the night from Saturday to Sunday. But not only we but also the weather forecast was too optimistic. The reality in the last five days consisted of winds 7 to 8 against which the Poseidon steamed untiringly and of 5 to sometimes even 6 meters of sea. So today we continued the fifth day rocking and rolling with the waves, whipping



**Fig. 2.** Radiosonde launch on the evening of March 4 to measure the atmospheric boundary layer.



**Fig. 4.:** The mass spectrometers of Dennis and Helmke have been measuring flawless, sulphurous and halogenated compounds in seawater since the beginning of the voyage. The compounds are produced in water and then released to the atmosphere.

Tonight, however, we will finally arrive at our first station off the Canary Islands, where in the next three days we will conduct intensive depth and surface profiling in the immediate vicinity of the islands of Hierro, Gomera, Tenerife and Gran Canaria and measure various parameters in the sea water and air (Fig. 6).

In the water samples we examine exactly, as in the surface samples on the transit, various biogenic and anthropogenic trace gases, the marine carbonate



Fig. 5: Swell between Cape Verde and the Canaries (Dennis Booge).



Fig. 6: Claudio prepares the next CTD and pins the UIs on. Each bottle receives a unique number (Unique Identifier), which is then also assigned to the water samples to facilitate later identification of the examined parameters.

system, nutrients, the organic matter in seawater, the phytoplankton community and their diversity. On Thursday afternoon, a harbor entry is planned in Las Palmas, where a part of the scientific crew will change. The continuously measuring devices are occasionally turned off by magic hand, whereby we could not clarify the cause yet. However, the sensors were generally noticed immediately by red flashing warning messages, so that we were able to restart them quickly and have so far lost only a minor amount of data.

by intense eddy activity in this area (Fig. 8) is. The measuring instruments showed an expected increase of some trace gases, such as bromoform, which is an ubiquitous metabolic product of marine algae. However, since it also occurs in large quantities in anthropogenic disinfection processes, we expect high concentrations in coastal areas of the Canary Islands in the next few days.

In the rather phytoplankton-poor marine area south of the Canary Islands, we crossed a filament that, as an offshoot of the Mauritanian upwelling area off the African coast, transports diatoms and other microorganisms into the open ocean (Fig. 7), supported

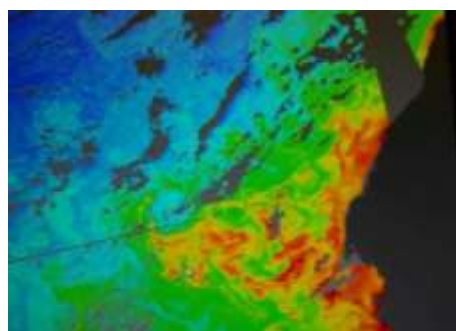


Fig.7: Elevated chlorophyll ([www.worldview.atomdata.nasa.gov](http://www.worldview.atomdata.nasa.gov)) content in a filament from upwelling

Everyone is looking forward to a calmer sea near the islands.

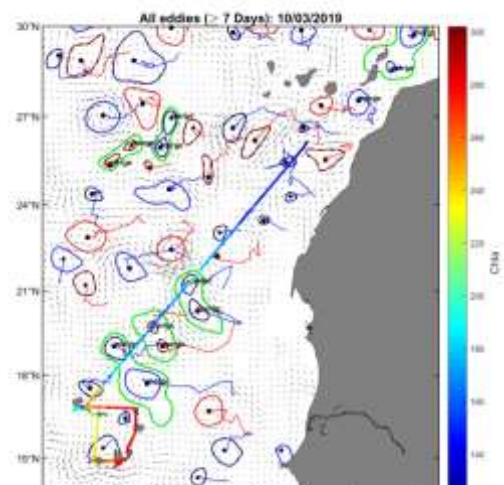


Fig. 8: Eddy activity off Westafirka with route of Poseidon and Chl a (Claudio Cardoso).

Greetings from the Poseidon, where all are well.

Yours Birgit Quack