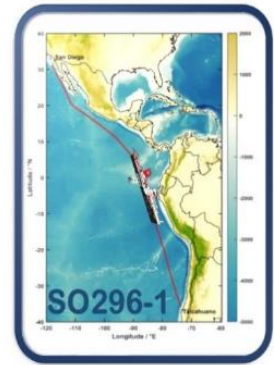


FS SONNE – SO296/1

27.12.2022 - 18.01.2023

Port Hueneme (USA) – Talcahuano (Chile)



3rd Weekly Report (10. - 17.01.2023)

After crossing the equator in the second week, station work continued to go smoothly. Out of the Peruvian latitudes, we continued south and finally reached Chilean waters. From here on, the weather changed. The winds increased somewhat along with the swell and a dense cloud cover hung in the sky. Both the air and water temperatures dropped. Tropical temperatures were now over despite the prevailing summer in Chile. We also had to take another break from sampling in Chilean waters on January 14. The reason was again the crossing of a protected area called "Nazca-Desventuradas". Here, too, any kind of sampling is prohibited for the protection of the marine ecosystem.

On January 12 between 14° and 15°S, even before we reached the protected area, we observed a surprise in terms of chlorophyll a, which increased to 3 mg/m³. This was also reflected in the significantly higher nutrient concentrations (Fig. 1). The concentration changes had an impact on filtration operations. The higher productivity in these waters resulted in the rapid occupancy of filters prepared for POC and chlorophyll measurements. Consequently, the volumes of water samples had to be reduced from two liters to one liter to allow flow during filtration. This phenomenon also affected the effectiveness of the filtration system for microplastic determination. After only a few liters, the filter became clogged, which could be observed by the reduction in flow. For this situation, again, the only option was to reduce the sample volume. Samples were taken every three hours along with the other parameters (chlorophyll a, POC, DOC, SPM, nutrients, and estrogens). Instead of the usual nine hours filtration, the filter had to be changed about every 10 minutes to avoid a blockage of the filter.

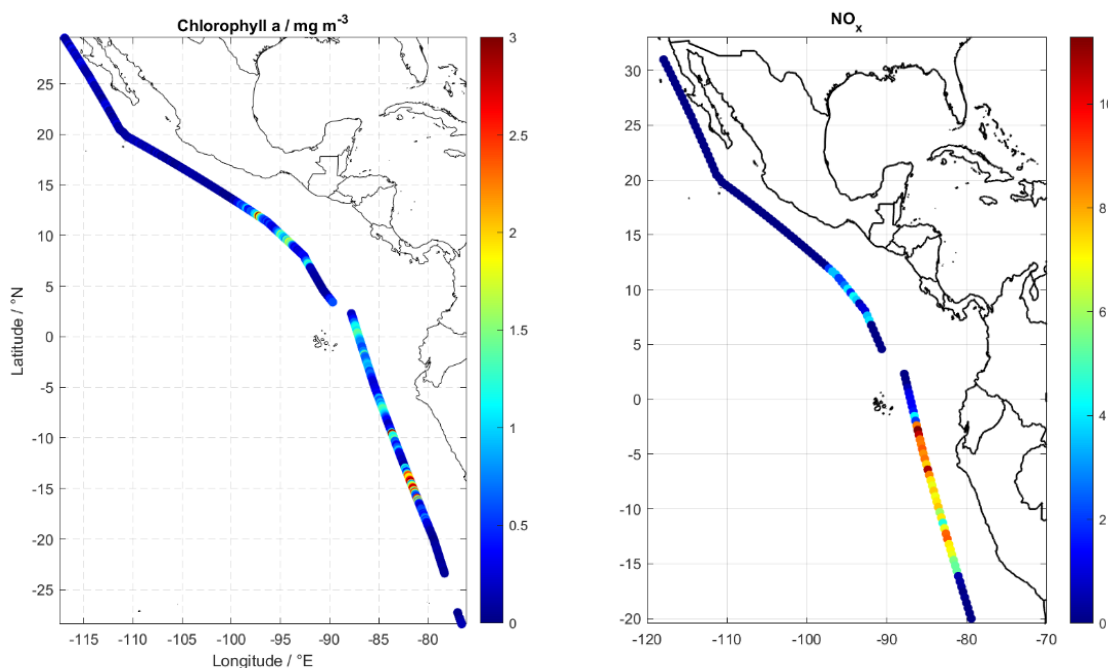


Figure 1: Chlorophyll a concentrations on the left and an example of surface water nutrient (NO_x) concentrations along the entire transect to date on the right.

How much microplastic could be filtered out of the water in each case in this way can unfortunately only be determined in our terrestrial laboratory at the IOW in Warnemünde and the University of Rostock.

Besides these circumstances, the sight of a visible phenomenon was breathtaking. What before were only small bioluminescent areas appearing as short balls of light in the water, was this night a light blue illuminated sea behind the ship, excited by the ship's propellers (Fig. 2).

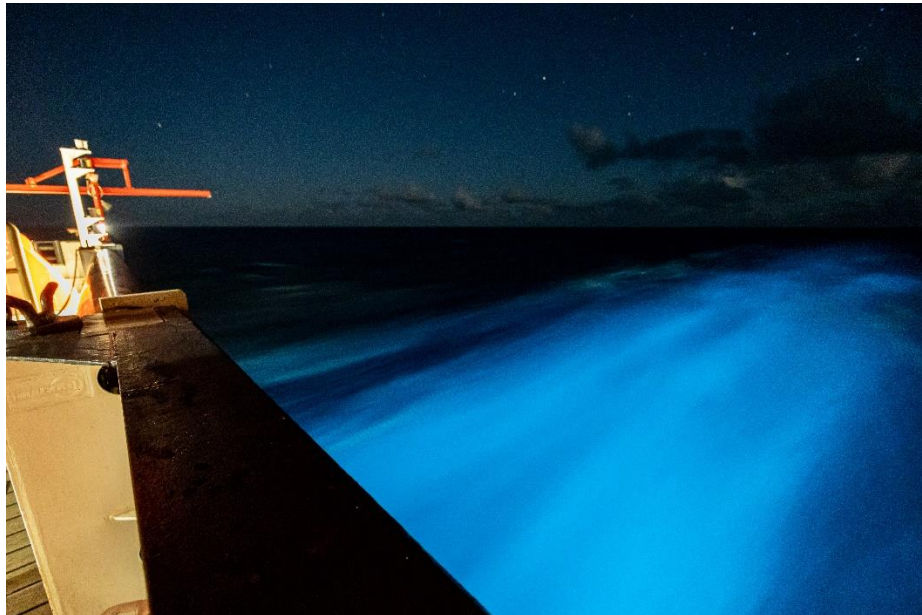


Figure 2: Bioluminescent phytoplankton illuminates the water behind the ship at night. (Photo: N. Mönnich).

In addition to the station work, which continued again every three hours after the passage of the protected area, other seminars were held. Jorge Pacheco introduced his country Chile and his university "Universidad Austral de Chile" in his presentation. He also presented the results of his master thesis, for which the focus was on the salt and temperature exchange between the Pacific Ocean and a series of rivers (Rio Valdivia, Rio Tornageleones, and the Cruces River) close to Valdivia. In the end, he also thought about some traditional dishes and drinks from Chile and presented them to us.

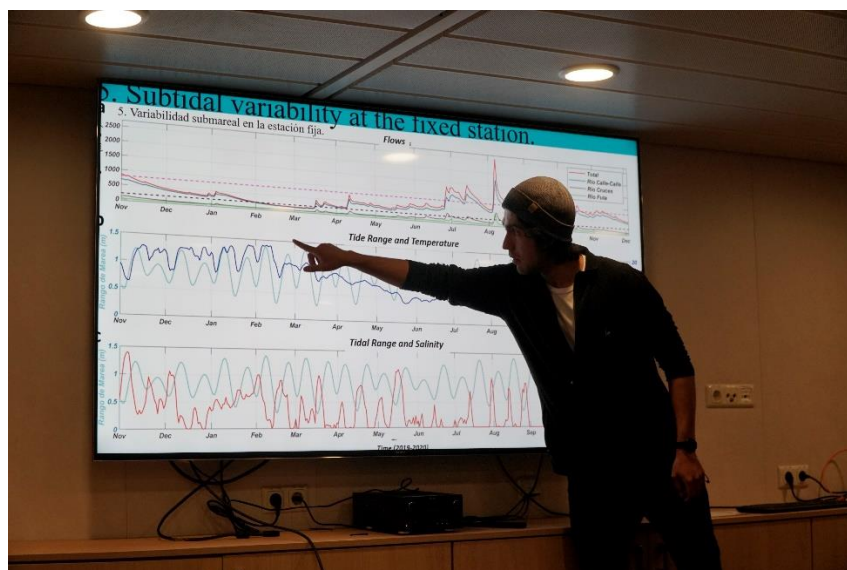


Figure 3: Jorge Pacheco presents the results of his master thesis in the seminar room (Photo: B. Klostermann).

Now all station work is almost completed, on the evening of January 17 the last sampling at station no. 151 will take place. After almost 5000 nm of travel we will reach our destination port Talcahuano (Chile) in the morning of January 18. There all equipment will be safely stowed in the container for transport and the cruise participants will start their homeward journey.

After more than 35 years in marine research, this is my last weekly report. I thank all those who have accompanied and supported me for so many years!



Figure 4: Still represented, the group of Boobies around and on the ship (photo: A. Estelmann).

Greetings on behalf of all cruise participants

Detlef Schulz-Bull

(Leibniz Institute for Baltic Sea Research Warnemuende)