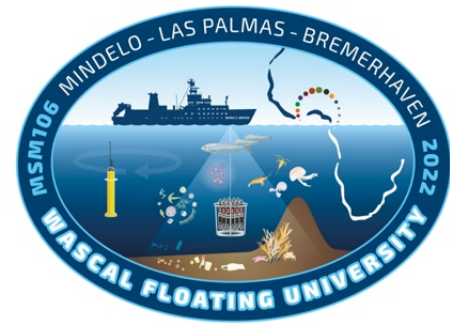


RV MARIA S. MERIAN - MSM106 (26.02. – 19.03.2022)
3. Wochenbericht (07.03. – 13.03.2022)



Last week began with the planned port call in Las Palmas on the Spanish island of Gran Canaria. A total of 4 scientists and 1 engineer from GEOMAR and the Thünen Institute of Sea Fisheries disembarked during the 7-hour stay in port. They made room for 4 more scientists from both institutes, who gave new impulses to the student training during the second leg of the cruise.

Unfortunately, there was no time for the new team to familiarise themselves with the conditions on board. Already 6 hours after setting sail, a physical, biogeochemical and ecological sampling of the time series station ESTOC (European Station for Time-Series in the Ocean, Canary Islands), located 60 nautical miles further north, began. Since 1994, sampling has been carried out at the station at more or less regular intervals to investigate biogeochemical cycles, the vertical transport of carbon and ocean acidification. Such time series have enormous value for science, as they offer the possibility to precisely quantify changes taking place in the ocean and to analyse them in an interdisciplinary way. The Achilles heel of such stations is often the availability of ship capacity on site, so sampling during MSM106 has been an important contribution to the continuation of these time series. Such sampling was also previously carried out in Cabo Verdean waters at the time series station CVOO (Cabo Verde Ocean Observatory, see Fig. 1, left).

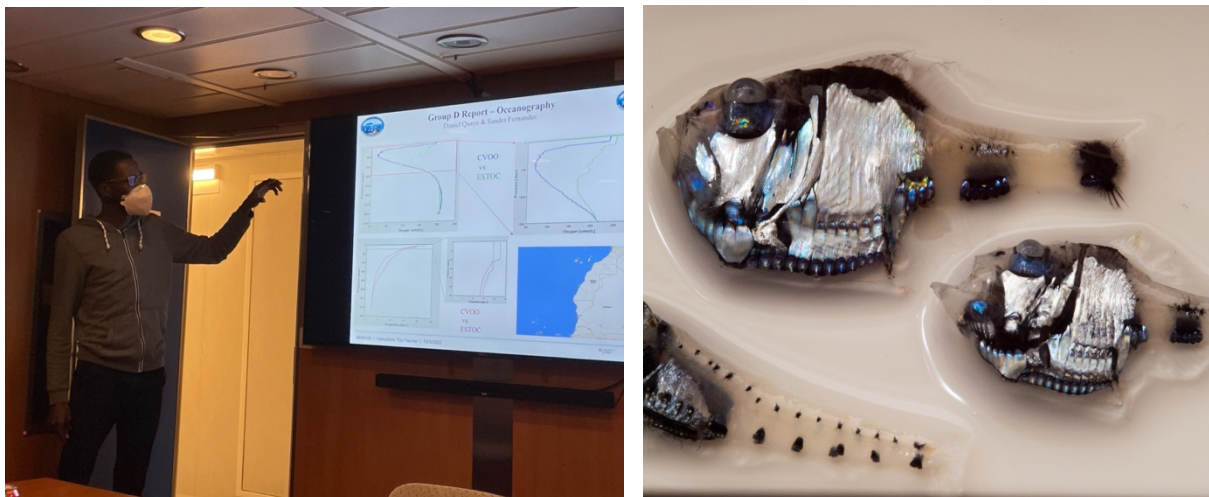


Figure 1, (B. Fiedler / H. Fock): Daniel Quaye from Ghana compares hydrographic data collected at CVOO and ESTOC (left). *Myctophum nitidulum* - A subtropical species of lanternfish (Myctophidae) caught near ESTOC (right).

The colleagues from the Thünen Institute also started their work immediately and carried out depth-stratified sampling with a 0.5 m² plankton net with 9 individual nets as well as a 7 m² IKMT trawl (see Fig. 1, right). Together with the students, the change in species composition along the north-south gradient from the tropical latitudes to the Bay of Biscay as well as the daily vertical migration of plankton and fish fauna in the ocean - an important process for the global carbon

cycle and a component of the so-called biological carbon pump - is being investigated.

A towed catamaran was also successfully used to collect samples of microplastics at the sea surface. Before, the geometry of a mesoscale eddy got determined by two ADCP transects, which then got sampled at the edge and centre to better understand how microplastics are transported from the coast to the open ocean. On board, the first samples got measured directly with a hyperspectral camera, which allows a first characterization of the particles. The potential microplastic particles were dried, placed individually on a slide and then scanned all together. So far, microplastic particles have been found in every haul this week, but in very low concentrations. The work contributes to the JPI Oceans project HOTMIC, which investigates the horizontal and vertical oceanic transport of microplastics and its impact on the marine ecosystem.

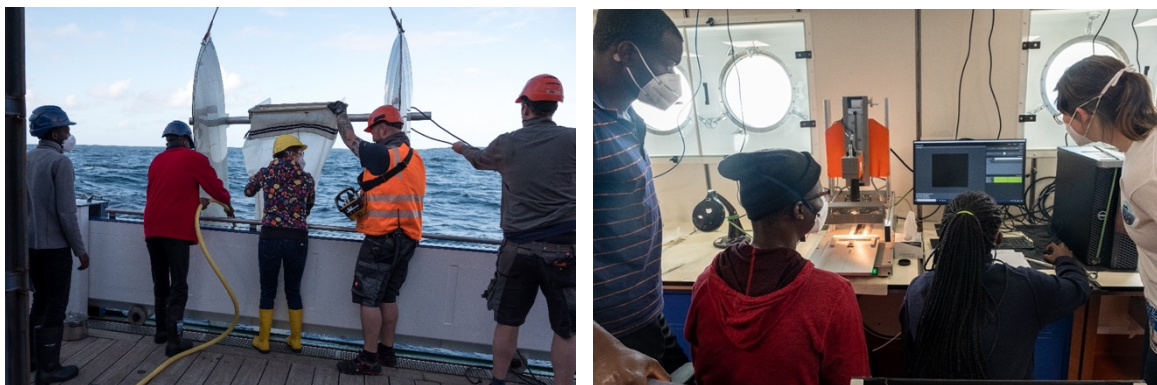


Figure 2, (S. Kahlert): Retrieve the catamaran and wash the sample into the "cod-end" at the end of the net bag (left). Gnilane Diouf from Senegal operates the Hyperspectral camera that allows to immediately identify if the particles were plastic or not (right).

In addition to the scientific work on board, each group of students also takes part in a module on science communication, which is taught and practiced on board by a member of the GEOMAR Communication & Media team. General methods for communicating scientific content to different target groups are explained to the students in more detail and smaller projects are implemented directly. For example, the entire student cohort designed and implemented a live event on the internet from on board the MARIA S. MERIAN as part of an international event. At the so-called Ocean Decade Laboratory "A Healthy and Resilient Ocean" as part of the UN Decade of Ocean Research for Sustainable Development, the students reported for over 45 minutes from the vessel. A large number of participants, mainly from West Africa but also from many other regions, were given an authentic insight into the work of marine scientists.

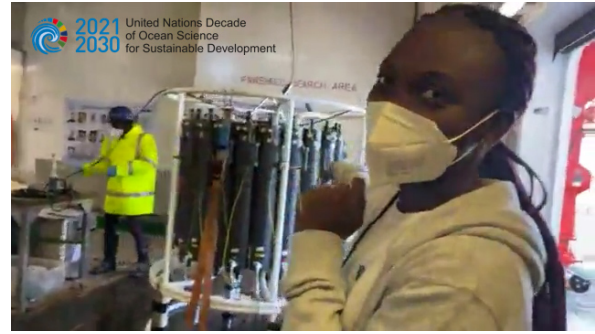


Figure 3, (S. Kaehlert): Melissa Ndure from Sierra Leone took viewers on a 45-minute tour of the working deck and through laboratories, interviewing her colleagues along the way.

After another sampling of a mesoscale eddy 100 nautical miles off the Portuguese coast, there is still daily station work to be done along the transit to Bremerhaven. A 5-metre swell and strong winds of 6-7 force make the station work difficult, but Captain Ralf Schmidt and his crew always manage to keep the MARIA S. MERIAN very stable in position and to carry out the instrument deployments safely.

On board, preparations are already beginning for the port call in Bremerhaven and the shipyard period. From the point of view of the scientific participants, including the students, a very successful voyage is almost behind us, despite the bumpy start (caused by a case of corona infection on board). The students have undergone a great development on board, worked with full commitment and learned a lot.

"There is no time to relax, everyone has to work!" as one student put it so aptly.

Greetings from Cape Finisterre,
Björn Fiedler and all MSM106 participants

GEOMAR Helmholtz Centre for Ocean Research Kiel