RV MARIA S. MERIAN – MSM107

18.05. - 03.06.2022, Bremerhaven - Tromsø

2nd Weekly Report (23. - 29.05.2022)

It has been a busy, but successful week on MARIA S. MERIAN. There was great relief when all crewmembers and scientists still tested negative for Covid after six days at sea. This meant that we could finally stop wearing FFP2 masks and for the first time see who we are at sea with.

We have just (Sunday 29 May) finished our third and last transect from the Irish shelf to the open ocean. These included 19 individual stations where we investigated the water column and the seafloor as well as five hydroacoustic surveys to study current velocities and directions, particles and organisms in the water column and the topography and composition of the seafloor over large areas at high resolution. The program is highly interdisciplinarity, but all scientists have worked together as one team to ensure optimal positioning and sampling of the individual stations. This starts with a key station in the open ocean where all water column properties are sampled. While the biochemists, biogeochemists, planktologists, microbiologists, and oceanographers work up the samples and analyse the data, our geophysicists and sedimentologists carry out a detailed hydroacoustic survey to identify specific sites with canyons, erosion and sedimentation.

Our research area is bordered by four key stations, two open ocean and two shelf stations, where we make high resolution investigations of carbon and nitrogen from production to transformation, transportation and turnover. These studies include particulate and dissolved organic and inorganic compounds in both the water column and the seafloor. The area bordered by the four key stations is covered by grid stations composed of three transects and detailed hydroacoustic surveys. This allows us to follow the fate of organic matter from its production in the surface ocean to the sedimentation in seafloor as well as its recycling and trophic transfer (see Figure 1).

The two open ocean stations included direct measurements of the vertical organic matter flux. This was measured using free-drifting sediment traps that were equipped with gel traps, conventional traps, CTDs for water column properties (temperature, salinity, chlorophyll, turbidity and oxygen), as well as a newly developed in situ camera to measure size-specific settling of individual aggregates during the 24 h deployment of the drifting traps (see figure 2).

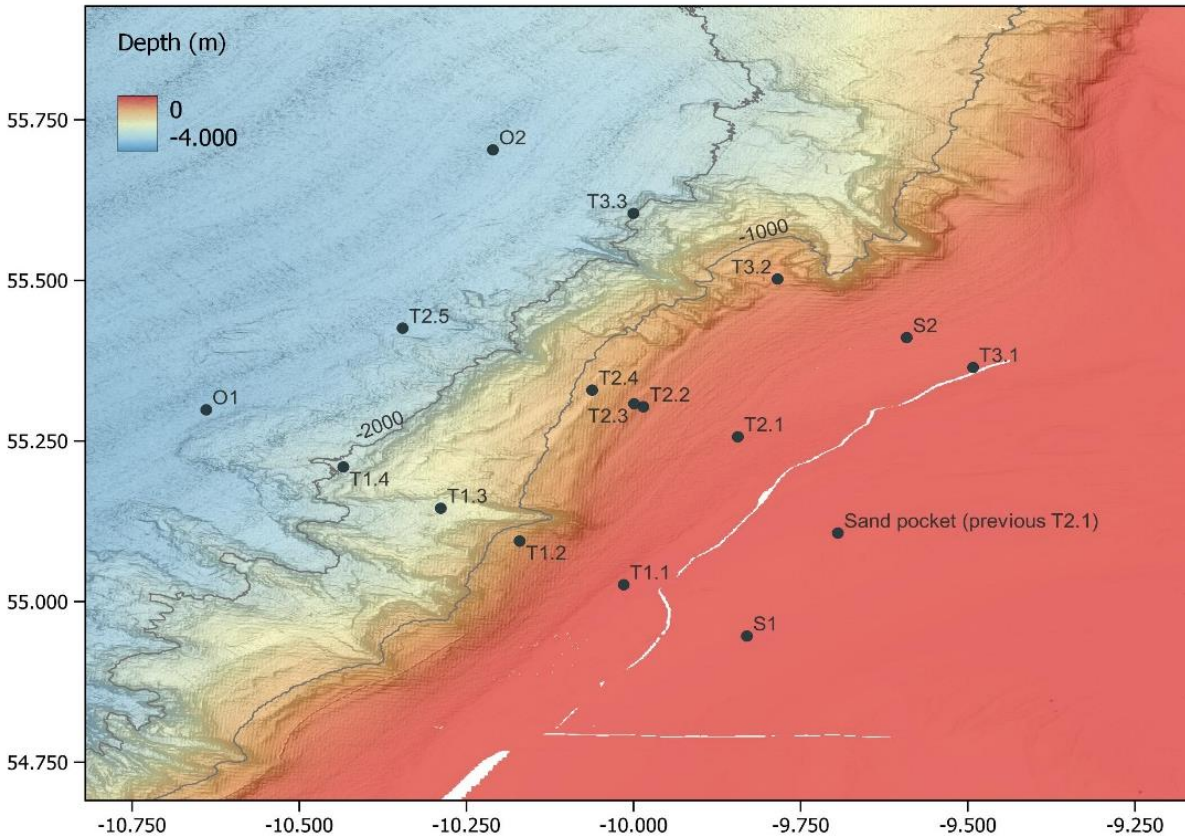

Fig. 1: Over-view of the research area off the Irish shelf.

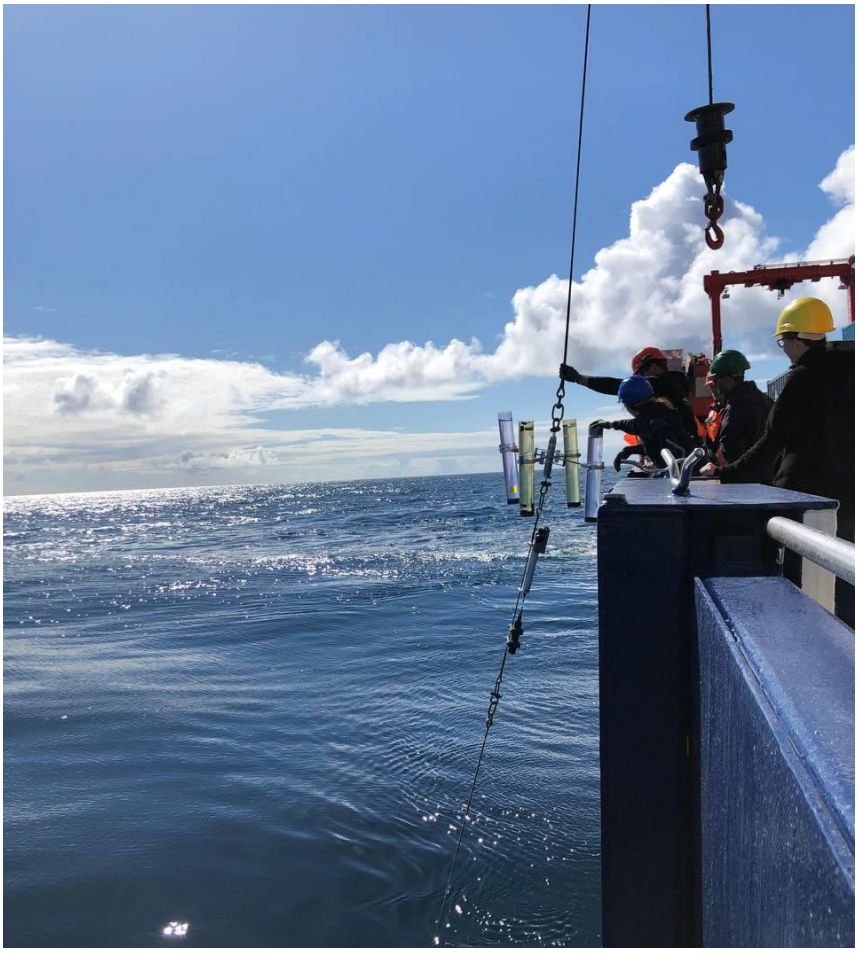

Fig. 2: Deployment of the second drifting trap where four collection cylinders are deployed gyroscopically at six depths; 100 m, 150 m, 200 m, 250 m, 300 m, and 400 m. Each of the four cylinders deployed at each depth is filled with a viscous gel that preserves the size and structure of individual settling aggregates.

On Monday 23 May, we deployed the CTD-Rosette and the in situ camera ROSINA on the grid stations T1.1, T1.2, and T1.3. At T1.3 we deployed in situ pumps and the multicorer as well. Tuesday 24 May, we sampled the first open ocean station, O1, where almost all our instruments were deployed: CTD-Rosette, plankton nets, drifting traps, secchi disc, marine snow catcher, ROSINA, and multicorer. Wednesday 25 May, we finished the sampling at O1 and continued with a hydroacoustic survey at the second transect. Hereafter, we investigated T2.1 and T2.2. In the morning of the 26th of May we made a hydroacoustic survey in the area between the middle and the northern transects and spent the rest of the 26th and the morning of the 27th of May to finished the second transect (T2.3, T2.4, and T2.5). In the afternoon on the 27th we started the long study at the second open ocean station (O2) where we performed similar studies to those done at O1. The studies at O2 were done in the afternoon on the 28th of May and we continued with a hydroacoustic survey of the northern transect and started the northern grid station in the evening of the 28th and continued until the morning of the 29th. After we had recovered the drifting trap on the 29th of May, we started our last hydroacoustic survey between the middle and the northern transects.

In the evening on the 29 May we will start our second shelf key station studies and spend the night between the 29th and the 30th finishing a few grid stations and a last hydroacoustic survey before we leave the research area off the Irish shelf.

The collaborations between the ship's crew and the scientists is still working perfectly and the mood on board the ship continues to be high.

Best regards from the Irish shelf and all MSM107 participants,

Morten Iversen

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