FS Meteor
Expedition **M206**

01.12.2024 (Fortaleza) –
30.12.2024 (Belém)

M206, 6. Weekly Report 29.12.-30.12.2024

To conclude the M206 cruise, a brief review of what we have achieved.
Our study area (Fig. 1) covered the estuaries of the Amazon and Rio Pará, from the freshwater endpoints along the salinity gradient across the shelf into the open Atlantic, where we reach the seawater endpoint. The study area also included the mangrove belt southeast of the Rio Pará and the river plume moving northwest to the mangrove-covered coast and shelf of French Guiana. While most stations were located in shallow water (<100 m), the outermost sampling sites were set at 2000-4000 m depth to capture the open ocean water in the background as well as the outer part of the river plume.

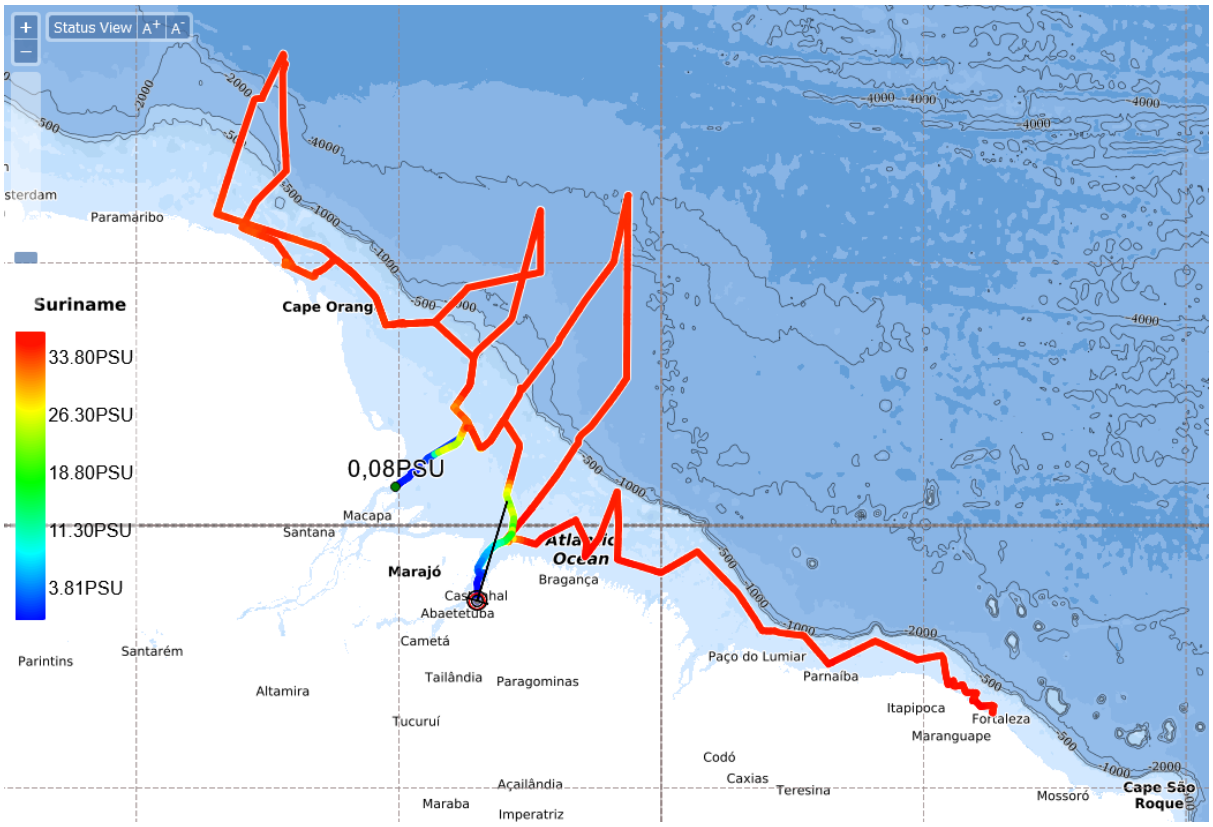

Fig. 1: The entire route of expedition M206, visualised using the TSG salinity data (DSHIP) recorded during the entire trip.

Sampling of the surface water and water column was conducted with a towfish (52 samples), a standard CTD rosette (39 deployments), a trace metal rosette (25 stations) and a bottom water sampler (14 deployments), surface sediments were sampled with a multicorer (deployed at 18 stations). Hydroacoustic measurements and satellite data were used to support station planning. The water stations were almost without exception successful and although we could not sample all areas optimally due to the restrictions of the Brazilian Navy, in the end almost all sample containers were filled. During the first transect along the mangrove belt, it was difficult to collect sediment and bottom water samples as multicorers and bottom water samplers do not work well on hard or sandy bottoms.

Along the Pará, Amazon South and North transects and in the northern extent of the Amazon plume, sediment quality improved so that muddy sediments and suspended sediments could be successfully sampled. The combination of surface sediment samples and suspended sediments on a transect outside the Amazon and along its sediment plumes offers the opportunity to study mineral alteration processes in detail when river particles come into contact with seawater.

After arriving in Belém on the morning of 29 December, the remaining time on 29 and 30 December was used to pack the last samples and equipment and to complete the data sets generated on board. We can say that under the given conditions, which were characterised by the strict requirements of the Brazilian Navy and the previous extreme drought in the entire region, we made the most of the opportunities and achieved a good part of the research objectives thanks to the excellent cooperation between all the scientists and the great support from the ship's crew with a great deal of creativity and commitment. The sample and data sets from the Amazon and Rio Pará river plumes will enable us to estimate the seasonal variability of the fluxes of trace metals and organic substances by comparing them with the data from the M147 during the rainy season. The intensive sampling of the regions with dense mangrove belts and the integration of data directly from a mangrove area from the previous PROBRAL campaign will enable us to better categorise the material flows from mangrove systems in comparison with those from the rivers and their corresponding role in the bioproductivity of the coastal regions. There are already indications that the mangrove systems obviously play a greater role in this than previously known, which is important in view of the increasing global destruction of mangroves.

We say goodbye with a group photo of the M206 scientist group and wish everyone a good start in the new year and a successful and healthy year 2025!

On behalf of the entire M206 team - Andrea Koschinsky