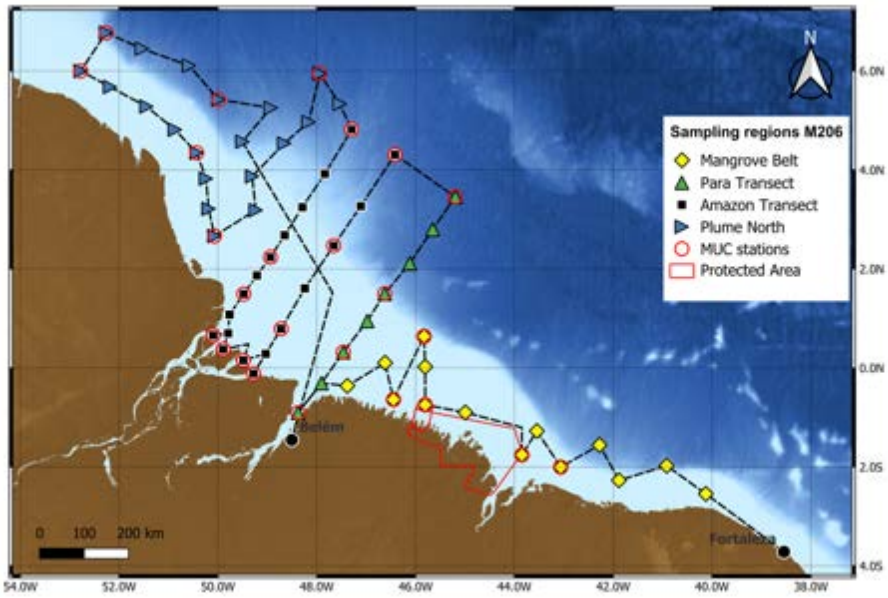
FS Meteor
Expedition **M206**

01.12.2024 (Fortaleza) –
30.12.2024 (Belém)

M206, 1. Weekly Report 29.11.-01.12.2024

On 1 December, the interdisciplinary research cruise M206 with RV Meteor departed from the port of Fortaleza at 9 am to study the distribution of trace elements, organic matter and isotopes that enter the Atlantic Ocean from the coastal mangrove belt on the way to the mouth of the Amazon River and through the Pará and Amazon River plumes. Around 20 % of the world's freshwater reaches the ocean via the Amazon, and the water spreads out into the sea in a far-reaching freshwater plume. In the process, it carries large quantities of trace metals such as iron and copper as well as certain isotopes and dissolved organic substances. These substances and the processes they undergo when river and seawater mix are the scientific objective of the project. This is the second time the team has investigated the area. In 2018 (cruise M147), they visited the area during the rainy season, and this year the sampling is taking place during the dry season, which is characterised by an extreme drought throughout the region, but especially in the upper Amazon, compared to regular years. This is probably already an effect of increasing human intervention in the sensitive Amazon ecosystem, e.g. through the construction of dams, deforestation and intensive agriculture. In addition, climate change will measurably change the flows and material inputs from the Amazon and other rivers into the ocean.



Preliminary route and station planning for cruise M206; water samples are to be taken at all stations; sediment stations are also planned at the stations outlined in red.

The cruise is being carried out in close cooperation between the Constructor University and the GEOMAR Helmholtz Centre for Ocean Research in Kiel, the University of Oldenburg, the University of Hamburg, ETH Zurich and the Brazilian universities Universidade Estadual do Norte Fluminense, Universidade Federal de Santa Maria and Universidade Federal do Rio Grande do Sul. In addition to the DWD employee, a total of 28 scientists (mainly from the fields of marine biogeochemistry, physical oceanography, isotope geochemistry and analytical chemistry) and an observer from the Brazilian Navy boarded the ship on 30 November and continued the set-up work on the working deck and in the laboratories that had already begun the day before. Prior to this, a reception organised by the

embassy had taken place on 29 November from 3 p.m. with around 30 guests from politics, the navy, embassy staff and scientists. In a 90-minute event in the conference room, after a welcome by Captain Rainer Hammacher and the organiser Nina Sartori from the embassy and a brief overview of the results of the previous cruise M205, the chief scientist Andrea Koschinsky and the Brazilian scientific representative Carlos Rezende provided information about the scientific objectives and content of the cruise. After a brief insight into the planned intensive outreach concept by Clive Maguire, the participants were given guided tours of the various areas of the ship and then had the opportunity to view the scientific posters on display and the equipment already set up on the working deck over drinks and snacks. This closing event was primarily used for intensive dialogue and networking among the various participants and came to a formal end at around 7 pm.

Photos from the reception on 29 November 2024 on board FS Meteor before the start of cruise M206; left: Presentations on the aim and content of the project; right: Some guests including the State Secretary during the subsequent exchange

The set-up of the equipment and laboratories continued over the course of 1 December following the safety drill and equipment deployment planning. In addition to Meteor's own CTD rosette, pumps for sampling surface water, a relatively new trace metal-clean mini-rosette, a multicorer and a bottom water sampler will be used to take water and sediment samples in a depth range of 10-2000 m along the coast, on the shelf and beyond the shelf edge. Hydroacoustic methods, especially ADCP measurements, will also be used. Furthermore, we will use available satellite data to obtain information on freshwater inputs based on salinity and chlorophyll distributions, which will be used for detailed station planning. The thermosalinograph runs continuously and also shows us small-scale changes in the salinity of the surface water. On 2 December at 8 a.m. we will start with the first station, where the CTD rosette as well as the pumps and the trace metal-clean mini-rosette will be used.

We document our journey with daily entries in a blog and look forward to interested readers accompanying us on our journey:
https://andrea-koschinsky.org/category/m206/ (English)

Everyone on board is feeling well and sends our best wishes!
Andrea Koschinsky (M206 chief scientist) and the entire M206 team