RV MARIA S. MERIAN - MSM112 “RioM ROFI”

The Rio Magdalena Delta Region of Freshwater Influence

07.10. - 14.11.2022, St. John´s (Canada) - Cartagena (Colombia)

4th Weekly Report (24. - 30.10.2022)

Expedition MSM112 "RioM ROFI" off the Caribbean coast of Colombia has picked up pace. Two of the subaqueous canyons off the mouth of the Rio Magdalena have now been surveyed. With the EM122 multibeam echosounder, spatial data of the seafloor from the thalweg to the higher adjacent areas are now available. The gradients are impressive: It is only 38 nautical miles from the shallow shelf to water depths of almost 2900m. In some places the channels have eroded 400m into the adjacent rocks. With the parametric echo sounder the structure of the subbottom is measured. Profiles across the axis of the canyons can then be used to define suitable positions for sampling with box and gravity corers. The work with the equipment and the processing of the samples now is almost a routine, nevertheless, it is always exciting: Did the box corer close alright on the seafloor? Did the gravity corer penetrate the sea floor well? After a critical look at the winch rope tension diagram, one has quite an idea – but we can only be certain after the device is back on deck.

The liners of the gravity cores are cut into 1m sections, split lengthwise, and opened for sedimentological description. A deeper analysis will be carried out in the laboratories at home, but the initial descriptions and photographs already give a first insight into different depositional conditions: Distinct alternations of sediments of different characteristics. The boxes of the large box corer are opened, carefully described and immediately sampled: sub-samples are taken with push cores, syringes, and sample boxes and labelled for further analysis in the different laboratories in Germany and Colombia.

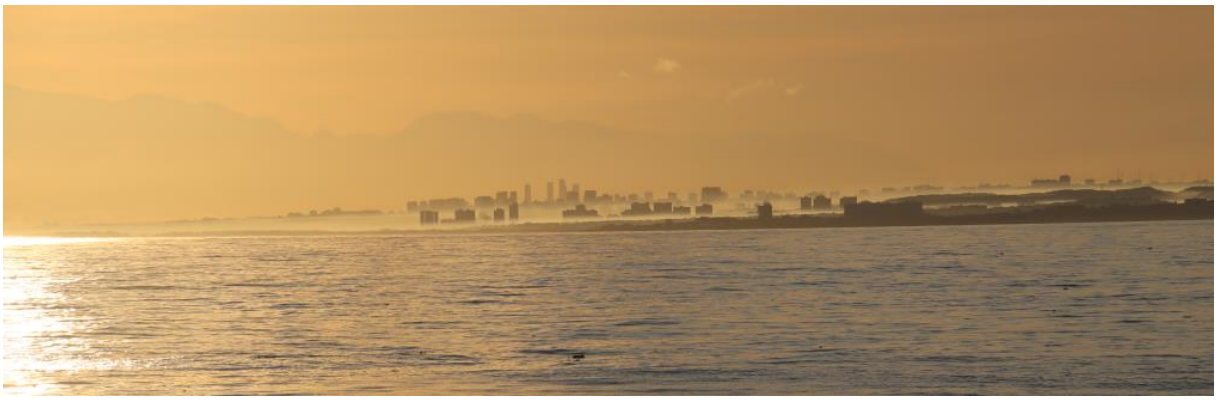
Left: A freshly split sediment core is prepared immediately after collection, Right: gravity sounder, box grab and the lander on deck of RV MARIA S. MERIAN during a quiet minute.

In the meantime, the longed-for extension of the research permit has also arrived - previously, the authorities in charge had approved the samples we applied for at exact positions - now we are allowed to optimize the previously specified position of cores and samples in a limited area. This also applies for the autonomous lander, a measurement system that is deployed to the seafloor for a period of time to measure data on waves and current velocities, grain sizes and turbidity of the water column. Thus we optimised the position taking into account the morphological conditions in the mouth of the Rio Magdalena. Now the lander is deployed at about 30m depth for the next two weeks.

The lander observations contribute to the second thematic field of our cruise: The characterization of the hydro- and transport dynamics in the region of freshwater influence. We are investigating the structure of the freshwater and sediment plume, which extends from the river mouth many kilometres out into the Caribbean Sea, using a variety of methods: In addition to the lander, the on-board installed current meters (ADCP) and the CTD probe, a towed catamaran with a measurement chain of sensors and a microstructure probe that is continuously winched up and down from the stern of the ship. For these observations, various transects had been defined on the basis of satellite images, which are now being traversed - in some cases repeatedly. Again and again we cross the obvious transition from the brown-grey sediment plume and the blue water of the Caribbean.

Greetings in the name of all participants,

Christian Winter (Kiel University)



Barranquilla in the morning