FS 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)

6th Weekly Report (07.11. - 13.11.2022)

The last week of the expedition MSM112 was still intense with with sampling and surveying. The week started in the waters off La Guajira, where we sampled stations with CTD in water depths up to 2600m, proceeding to shallow areas near the coast and took additional gravity cores and box cores. As in the weeks before, the conditions were perfect for the research work. The deployments went smoothly and the now excellently coordinated team was able to open, sample, process and archive the respective boxes and cores almost immediately. Things went very well and so - with a few stations for additional samples along the way - we were able to return to the first study area a little earlier than planned: the Rio Magdalena river plume.

First on the list was the recovery of the sea floor observatory. The lander had been in the river mouth for about two weeks at a depth of 30m and had recorded current profiles with several ADCPs. Despite many previous deployments of this device, it is always a relief when the acoustically triggered buoy surfaces, the line attached to it is reeled in, and then the lander is slowly hoisted on board. It was clearly affected by the turbid and polluted waters of the Rio Magdalena: With a very special smell and covered with a layer of organic material - biofouling. But also loaded with great data on hydro and transport dynamics in the estuary, including a short storm event - we had not felt that at all far away in La Guajira.

Figure 1: Recovery of the lander in the Rio Magdalena estuary.

Based on the observations of the first week and more recent satellite imagery, we had learned a bit more about the dynamics of the river plume and were able to optimize our measurement program accordingly. On specific profiles we can now make statements about the temporal variability of suspended sediments and density layers using data from repeated measurements. For these measurements, we combined profile measurements with the shipboard installed ADCPs with using a towed catamaran with various CTD and current sensors. At selected stations along and across the sediment plume, we collected water samples and determined the structure and nature of the sediment plume with microstructure probes, CTD, and LISST (in-situ particle sizing).

Figure 2: The towed catamaran with sensors for the measurement of near-surface currents and density stratification.

The MSM112 research program ended with the last CTD station on the afternoon of November 13, 2022, in the Rio Magdalena river mouth. All samples and cores are labelled, the data sorted, all aluminium boxes are packed, the containers loaded. On deck, the box grab and the gravity core rack are fixed, waiting for their next missions and the colleagues of the following expedition. We arrived in Cartagena in the morning, with beautiful views of this fascinating port city and great data, promising samples and the best memories in our luggage.

Many thanks to all involved in making this expedition possible: shipping company, Leitstelle, the ship's command, crew and all participating scientists and technicians on board and ashore.

Greetings in the name of all participants,

Christian Winter

(Kiel University)