

## 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)*



### **1<sup>st</sup> Weekly Report** (06. - 09.10.2022)

The Rio Magdalena is the main freshwater tributary to the Caribbean Sea. At the mouth its discharge interacts with tidal and wind-driven currents, mesoscale eddies, the Panamá-Colombia Current and possibly the La Guajira upwelling system in north-eastern Colombia, forming a unique region of land-sea interactions with complex transport patterns of water, sediments, nutrients and pollutants along the Caribbean coast, shelf and the open ocean.

The outer estuary of the Magdalena River is prototypical of a tropical ROFI (Region Of Freshwater Influence) system. Understanding the processes of fluvial and marine interactions is important, as tropical ROFIs are particularly vulnerable systems that may react strongly to climate change in the future.

The joint expedition MSM112 "RioM ROFI" of Colombian and German research groups with the German research vessel MARIA S. MERIAN aims to investigate geophysical, sedimentological and biochemical land-sea interaction processes. We plan hydroacoustic measurements, direct sampling (water, surface sediments, plankton, and box and gravity cores) and the deployment of an autonomous seafloor observatory (lander). Research objectives are to understand the dynamics and extent of the mixing zone and the river plume; to analyse transport pathways of suspended sediments and bottom sediments; and to reconstruct the evolution of the recent delta.

First, however, is the twelve-day transit from St. John's (Canada) to Cartagena (Colombia). Our team from IOW Warnemuende and CAU Kiel and the containers came on board on October 6th. We could set-up the most important straight away and, after a bunker stop, set off in the evening. With a maximum speed of 10 knots through the water, due to the energy saving measures in place, we make good progress. We are sailing through the Sargasso Sea, the fascinating loops of the Gulf Stream, which we see in cross-section in the flow data of the Acoustic Doppler Current Profiler (ADCP). ETA in Cartagena is the 18<sup>th</sup> of October, and the Colombian team will board there. After a diplomatic reception on October 20 the actual research cruise will finally start. In the meantime, we set up the equipment, fine-tune the measurement programme and hold scientific talks and seminars. The weather is fantastic, and we are in good health!

Greetings on behalf of all participants,

Christian Winter

(Kiel University)