

23.12.2018 9° 22'N 079° 55'W off the Caribbean coast of Panama at the entrance to the Panama Canal

MSM80 CUSCO

First weekly report covering the period from 20.12. till 23.12.2018

The research cruise MSM80 with R/V Maria S. Merian at the turn of the year 2018 to 2019 is part of the research project CUSCO (Coastal Upwelling System in a Changing Ocean) funded by the German Federal Ministry for Education and Research (BMBF).

Coastal upwelling systems belong to the most productive marine ecosystems worldwide. Although they only cover 2 per cent of the ocean surface, they provide 20 per cent of global fisheries yield. Reason for this high productivity is the upwelling of nutrient-rich water from greater depth, driven by the trade winds. As soon as the nutrients reach the sun-lit surface layer of the ocean, they trigger and fertilize an algal bloom.

In spite of the generally high productivity of upwelling regions, there are substantial differences in the food chains between the four major coastal upwelling systems of the Canary Current off Northwest Africa, of the Benguela Current off Southwest Africa, of the California Current off the North American Pacific coast, and of the Humboldt Current off Chile and Peru. Although all these ecosystems show a similar upwelling intensity and primary production (growth of micro-algae), the coastal upwelling system of the Humboldt Current exceeds the others in terms of fisheries yield eight- to tenfold. One fish species alone, the Peruvian anchovy, provides up to 12 Mio. tons or more than 10% of the global marine fisheries yield in certain years.

The CUSCO project and the research cruise MSM80 address the question, why in particular the coastal upwelling system of the Humboldt Current off Peru produces so much fish biomass. What are the reasons and mechanisms that lead to such an efficient transfer of energy along the food chain?

To answer this question, an interdisciplinary and international research team is on board: five nationalities from three German universities, two German marine research institutions, and the Peruvian fisheries research institute IMARPE. In the following weekly reports, the different teams on board will introduce their respective research.

During the first few days on board, we unpacked our expedition equipment from the freight containers, assembled measuring devices and plankton nets, and established ourselves in the labs.

We benefited from the fact that the ship was still moored in port on the first day and after that anchored on roads off the Caribbean coast of Panama with very calm conditions.

Captain Maaß and the entire crew of Maria S. Merian provided active and very skilful support.

After we took up fuel yesterday on roads, we are now looking forward to the passage through the Panama Canal tonight and Christmas at sea, before we will reach our study area in the South Pacific off the coast of Peru in a few days time.

The weather is sunny and tropically warm with 28°C. The atmosphere on board is fine, and we are looking forward to the start of our research cruise with – hopefully – lots of samples and interesting results.

On behalf of all cruise participants, I wish you a Merry Christmas and best regards from R/V Maria S. Merian,

Holger Auel



Fig. 1: Introduction to safety procedures: How to get into a survival suit? (Photo: H. Auel)



Fig. 2: Pilot boat alongside R/V Maria S. Merian off the Caribbean coast of Panama (Photo: H. Auel)