METEOR Cruise M157

Mindelo (Cape Verde Islands) – Walvis Bay (Namibia); 04. August – 16. September 2019

6. Weekly report; 15. September 2019

In the past week, the work on the transect at 25°S could be completed. In the late Thursday evening the METEOR reaches the working area along the 23rd latitude for the last time. Here some profiling measurements could be made in the water column (see below) and samples could be taken to complete the previously obtained data set.

In past weekly reports, various groups have already reported on their work on board. The last in this series is the chemistry group, who seeks to measure concentrations of dissolved trace gases, a core purpose in EVAR linking between processes in the atmosphere, water bodies and sediments on the seafloor.

The high production of organic life in surface waters leads to significant fluxes of organic carbon through the water column down to the seabed. The microbial degradation of dead organisms preferentially consumes oxygen and releases the trace gases N_2O and CH_4 when sinking through the water column as well as on and in the sediments. Their concentrations can already be analysed at relatively shallow water depths. On this cruise we investigate the seasonal cycle of transport and exchange processes of these gases by continuous measurement (Fig. 1), as well as by determination of the respective concentrations in discrete samples from the water body (Fig. 2).

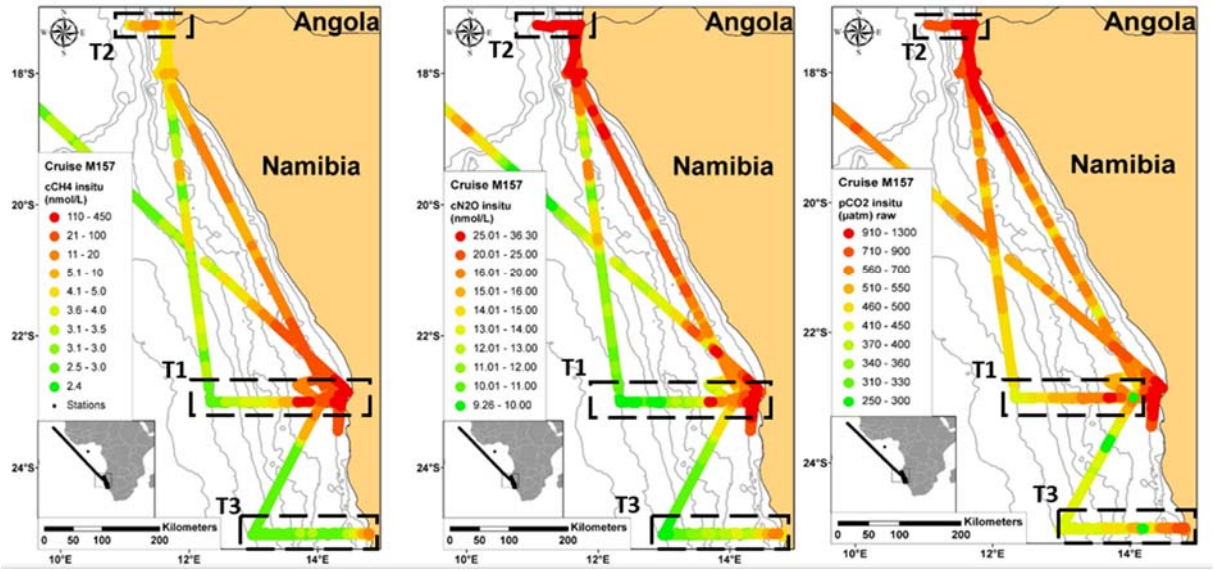

Fig. 1 Distribution of important trace gases in surface waters along out cruise track

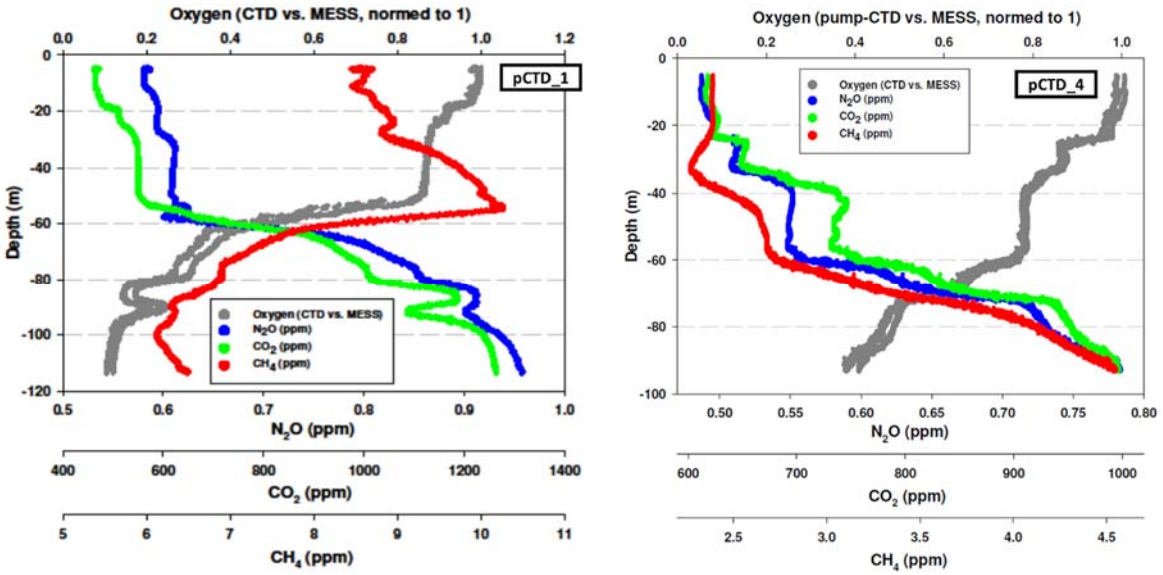

Fig. 2 Extremely high resolved vertical profiles of trace gas concentrations at one of the sampling sites. Sampling was carried out by means of a Pump-CTD.

A total of 291 discrete water samples were collected at 30 selected stations to determine the trace gas concentrations within the water column. The new measurements are a valuable key to broadening the current understanding of different exchange processes, their temporal and spatial variability, and their complex biogeochemical interactions in the high production area of the Benguela system.

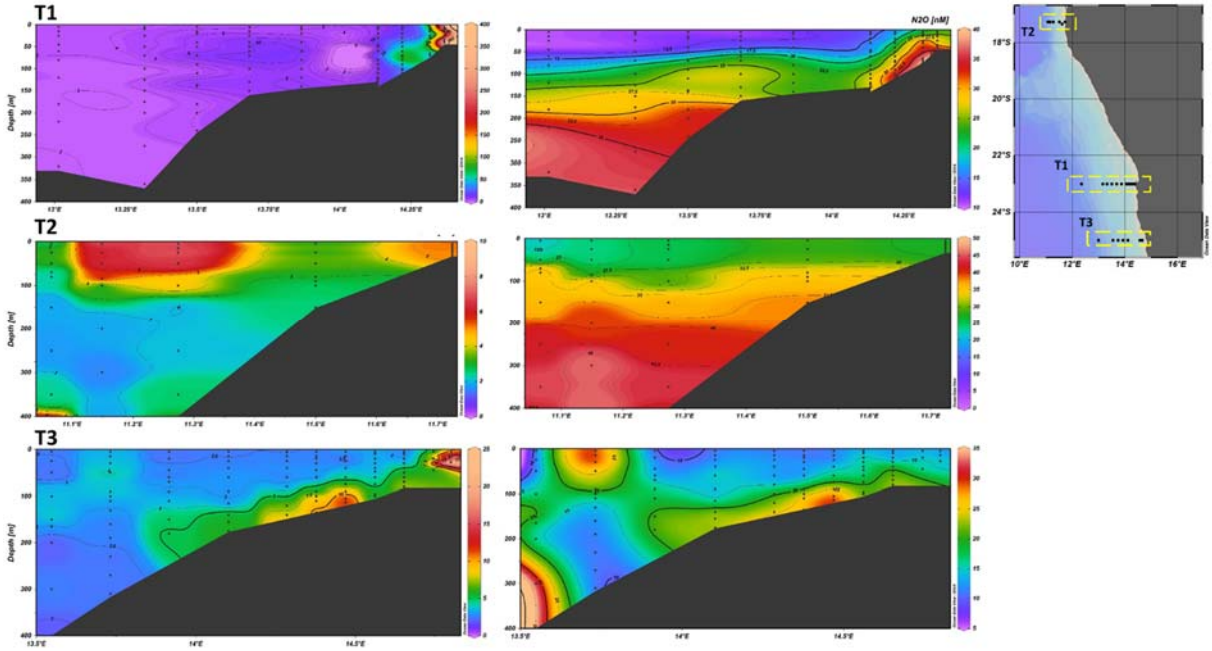

Fig. 3 2D profile sections of trace gas concentrations through the water column along the three transects studied during this cruise.

Expedition M157 is coming to an end. If everything goes according to plan, the Meteor will arrive tomorrow morning in the port of Walvis Bay where the work program of this cruise started four weeks ago today. In total, we covered 6,300 nautical miles, half of which was the transit from Mindelo to Walvis Bay. We were able to collect samples and measurement data at 49 individual stations and drove about 330 instrument operations. We would like to take this

opportunity to thank the entire METEOR crew for ideally supporting our extensive research program. With this, I want to conclude the last weekly report of this METEOR expedition.
We are looking forward to our families and friends.
Matthias Zabel und das M157-Team

On behalf of the M157-Team,
Matthias Zabel
Universität Bremen