# M136

(11.04. – 3.05.2017)

## 1st Weekly Report April 16, 2017

FS METEOR cruise M136 began in Callao, Peru on April 11. The research cruise is the second of four cruises to the southeastern Pacific carried out within the framework of the DFG Collaborative Research Center (SFB) 754 „Climate-biogeochemical interactions in the tropical ocean“. The scientific measurement program focuses on advancing understanding of benthic and pelagic nutrient and trace metal cycling in oxygen minimum zones and on quantifying the associated loss of nutrients in the ocean. Additional objectives are determining ventilation rates by submesoscale processes, quantifying export fluxes of particulate organic matter out of the euphotic zone, and determining production and decay rates of dissolved organic material in the water column, as well as investigating mechanisms of iron stabilization, removal and cycling in the water column.

The interdisciplinary focus of the SFB 754 is also reflected by the participating scientists - physical oceanographers and biogeochemists specializing on benthic as well as pelagic metabolic processes are collaborating during the cruise. We are involved in 6 different SFB 754 subprojects and work in 9 different research units.

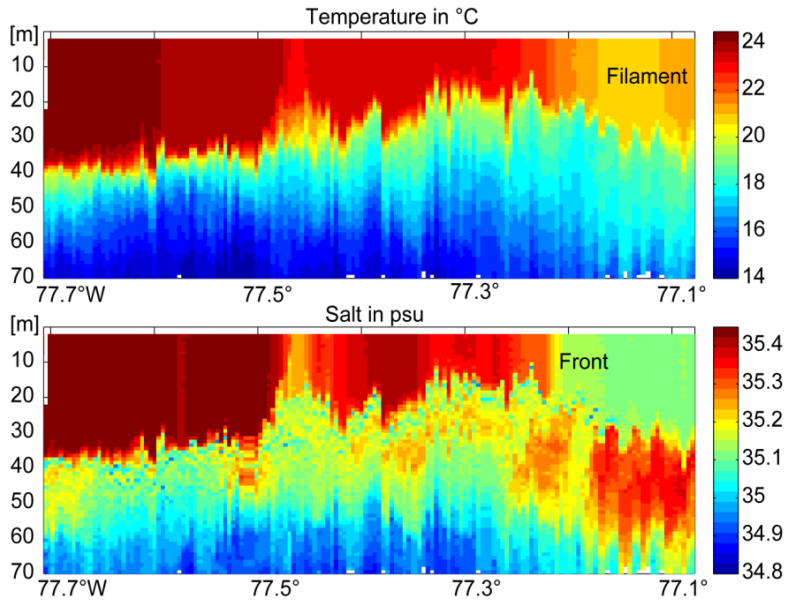
One day before our departure from Callao port, a reception was held on FS METEOR. It was nicely arranged by the German Embassy in Lima, Peru. About 80

*Photographs of the reception on FS METEOR in Callao port. (Fotos: U. Papenburg)*

guests joined the reception from different departments of the Peruvian government, colleagues from Peruvian research institutions, and employees of the German Embassy including vice Ambassador Schmidt. We were particularly happy about the visit of vice Minister for Production Hector Soldi and the President of the Peruvian marine research institution IMARPE Admiral Javier Gaviola. The Peruvian President Pedro Pablo Kuczynski had also announced his participation, but was forced to cancel at short-notice for a visit to northern Peru which is currently suffering from severe rainfall and floods.

The reception began with welcome speeches by the METEOR captain, the chief scientist of the cruise, the vice Ambassador and vice Minister Soldi. Guided tours around the ship including the bridge and laboratories were offered and the guests were invited to a presentation about our research activities off Peru. The reception was a great success and was complemented upon by our guests.

On Tuesday, METEOR left Callao at midday. The scientific program started three hours later with a hydrographic section along the continental slope in a southerly direction using RapidCast, an underway hydrographic profiling system (see left). At 14°S, a section perpendicular to the continental slope was completed that included water sampling for physical and biogeochemical parameters. Additionally, a mooring and a drifting sediment trap were deployed. The 14°S section ended on Friday with all objectives achieved.




*High spatial resolution measurements of temperature and salinity profiles sampled with the RapidCast system (preliminary data). (Graphik: S. Thomsen)*

Since then we have been conducting a three-day study to investigate the coupling between physical and biogeochemical processes at fronts and within cold filaments. Off Peru, fronts and filaments are particularly pronounced during austral fall. Near real-time satellite data is simultaneously used to locate the filaments which are then sampled for hydrographic parameters with the RapidCast system at high spatial resolution. These data are then used to select optimal positions for biogeochemical sampling.

*Snow Catcher (Foto: J.F. Schubert)*

A further focus of our work program is to quantify anaerobic processes occurring inside particles while they sink through oxic parts of the water column. For the first time, we are using a so called “snow catcher” for collecting particles, which is a large vessel for retrieving 100 liters of sea water at a particular depth. The mechanism for closing the lower and upper lids of the snow catcher is similar to the mechanism used for the Nansen bottles 50 years ago. Once it has been lowered on a cable to the desired depth, a weight (messenger) attached to the wire is dropped that activates a release mechanism to close the lids slowly, preserving the particles trapped inside.

Today, on Easter Monday, despite the high workload, the mess was nicely decorated and we enjoyed a great Easter feast thanks to the galley and stewards. The fine weather and the excellent support from Captain Jan F. Schubert and the crew of the METEOR ensure a great atmosphere on board.

Happy Easter from the tropical South Pacific.

Marcus Dengler and the participants of M136