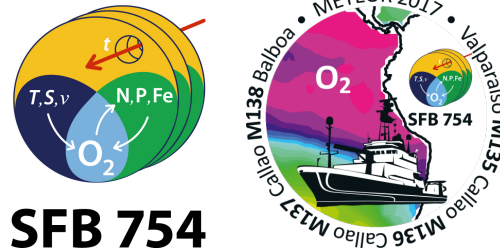


**Meteor cruise M137, Callao – Callao, 06. – 29. May,
1. weekly report, 07. May 2017**

Stefan Sommer and the entire M137 Team



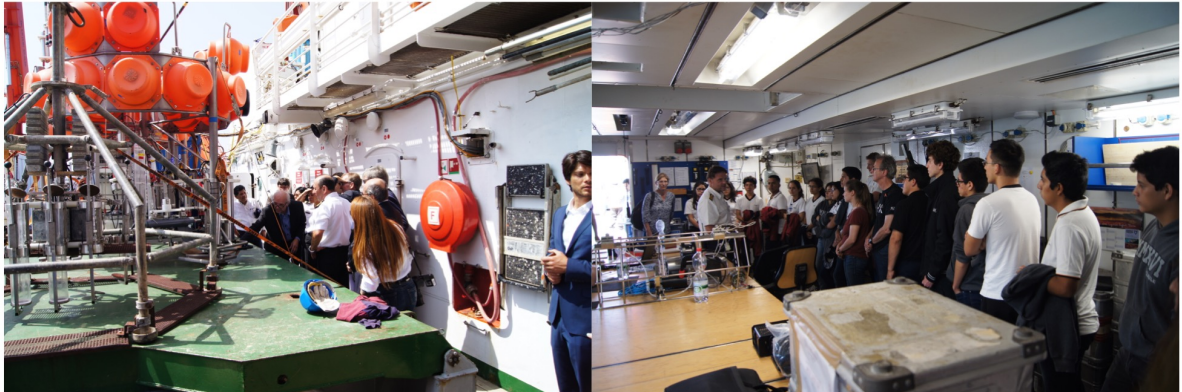
The METEOR expedition M137 to the oxygen minimum zone (OMZ) off Peru takes place within the framework of the Kiel collaborative research centre SFB754 (Climate – Biogeochemistry Interactions in the Tropical Oceans). OMZs represent key-regions for the marine biogeochemical element turnover. However, still we lack a complete understanding of which processes and feedbacks between the seafloor and the water column cause the presently observed expansion of OMZs.

Aim of the research cruise is to quantify the solute fluxes between the seafloor and the bottom water and its transfer to the higher water column. Particularly at the upper and lower boundary of the Peruvian OMZ the availability of oxygen (O_2), nitrate (NO_3^-) and nitrite (NO_2^-) in the bottom water is highly variable at different time scales. The impact of such variable conditions on the solute turnover and fluxes between the seafloor and the bottom water shall be experimentally determined in order to quantify the nutrient and trace metal budget over longer timescales using numerical models. This will contribute to increase our predictive capability of the future development of the Peruvian OMZ.

Two key organisms, the sulfur bacteria belonging to the genus *Thioploca* and *Beggiatoa* as well as foraminifera, which are single cell organisms are in the focus of these experiments. Both groups of organisms are able to store high amounts of NO_3^- and NO_2^- , which they use for their energy metabolism and thereby strongly affect the nitrogen turnover in the sediments and the water column. Dependent on the presence of dissolved sulfide in the pore water of the sediment and O_2 availability in the bottom water the sulfur bacteria can further affect the phosphorous cycle in the sediment. Another experiment focuses on processes leading to the massive release of sulfide from the seafloor, which is highly toxic to all aerobically living organisms and causing an extreme perturbation of the ecosystem with major effects on aquaculture. As during the previous METEOR cruise M136, the coupling between seafloor processes with physical processes in the bottom boundary layer and the water column is major focus of the station work of this cruise.

These tasks represent a major challenge, hence scientists from 6 different institutions, covering different disciplines are on board of RV METEOR. This includes physical-, chemical, biogeochemical oceanography as well as microbiology and ecology and mirrors the interdisciplinary structure of the Kiel collaborative research centre. Eleven cruise participants were already on board since the previous cruise M136, the remaining participants including two Peruvian scientists from the IMARPE (Instituto del Mar del Perú)

boarded at the 4th and 5th of May. The stay in the harbour was used to establish the laboratories. At the 4th of May the German ambassador J. Ranau and collaborators as well as representatives from the Peruvian military visited RV METEOR. We conducted a tour around the ship and introduced the visitors into our scientific gear and research. The visit was very nice and all were very interested. At the following day RV METEOR was visited from pupils of the German-Peruvian School Beata Imelda in Chosica. At the late afternoon we conducted a small workshop with 11 scientists from IMARPE to discuss first results from the METEOR cruise M136.



Photos of the visit of the German embassy and Peruvian military representatives and the visit of the visit of pupils in the harbour of Callao (Photos: M. Dengler)

At Saturday at about 09:00 the RV METEOR left Callao during good weather conditions. After a short transit, we started with the station work along the depth transect at 12°S.

We look forward to a successful expedition with calm weather.

All on board are fine. With kind regards,
Stefan Sommer and the entire M137-Team