1st Weekly Report of M120, Recife – Walvis Bay

November 17th to18th, 2015

METEOR cruise M120 began on Saturday, October 17th in Recife, Brazil. The research cruise is part of the cooperative project SACUS „Southwest African Coastal Upwelling System and Benguela Niños“ funded by the German Ministry for Education and Research and the EU funded collaborative project PREFACE „Enhancing prediction of tropical Atlantic climate and its impacts“. The investigations in both projects focus on the upwelling regions of Angola and Namibia. The research objectives within the SACUS project aim at physical mechanisms of regional climate variability and change and its consequences for the ocean's biogeochemistry, hypoxia and marine ecosystems in the upwelling regions. Research within PREFACE focuses on a better understanding of the tropical Atlantic climate system, improved simulation and prediction of tropical Atlantic climate on seasonal and longer time scales and improved quantification of climate change impacts, including fish stock changes in the eastern upwelling regions of the tropical Atlantic.
M120 contributes to the projects' research goals by investigating the variability of eastern boundary current transport, water mass variability, and the propagation of coastal waves in the eastern upwelling regions of the South Atlantic. Additionally, the cruise focuses on a quantitative understanding of the physical processes controlling the mixed-layer heat and freshwater budgets. The observational program is complimented by measurements of greenhouse gas concentrations of CO_2, N_2O, CH_4 and CO_2 isotopes and measurements of the atmospheric concentrations and size distribution of aerosols.

International Cooperation

The scientific team of M120 includes 22 scientists and technicians (Fig, 1). Apart of participants from the Helmholtz Centre for Ocean Research Kiel, the Leibniz Institute for Baltic Sea Research Warnemünde and the Max-Plank-Institute for Meteorology, three international groups have joined the cruise. Particularly noteworthy is the participation of two young scientists from the National Institute of Fisheries in Angola who participate in a capacity building program on ocean observing systems and data processing during the cruise. Additionally, we welcomed onboard two participants from the Niels Bohr Institute of the University of Copenhagen, Denmark and one participant from the Institute of Marine Research in Bergen, Norway. The three international institutes are partners in the EU-PREFACE project that interconnects scientists from 8 European and 9 African countries.

Fig. 1. Scientific participants of M120 onboard Meteor in the harbor of Recife (Photo: Tina Dippe)

Underway measurements along the transatlantic transect at 12°S

FS METEOR left the port of Recife on Saturday at 7.30am local time and reached the first position of the transatlantic transect on Sunday at 9am board time. Since then, hourly measurements of temperature and salinity in the upper 400m of the water column are being conducted using an underway-CTD system. Additionally, upper ocean velocities are continuously recorded by the two shipboard Ocean Surveyors and concentrations of greenhouse gases in the surface layer are measured. In combination with bottom pressure sensors moored at the western and eastern boundary of the transect and the currently deployed western and eastern boundary current arrays, the data set will be used for investigating water mass variability associated with the meridional circulation variability across 12°S.

During our first two days, the meteorological conditions have been perfect for a fast transit towards Africa. The vessel steams against weak trade winds (2-3 Bft.) and weak swell from the south east with a mean velocity of about 11 knots. The current speed is faster than we had anticipated allowing us to make up time that we had lost due to repairs of METEOR‘s central hydraulic system.

We are experiencing an excellent onboard atmosphere to which the sunny weather and warm temperatures certainly contribute. Moreover, the cooperation with Captain Rainer Hammacher and the crew of METEOR has been outstanding.

Best regards from the tropical South Atlantic
Marcus Dengler and the participants of the M120 cruise