

MERIAN MSM76 – weekly report 2

13. – 19.09.2018

On 13 August we started deploying successfully the remaining three of a total of six moorings, with which we will observe for the duration of at least two weeks the turbulent circulation patterns that are important for the properties and the strength of the “Denmark Strait Overflow Plume” - the deep current flowing over the Greenland-Iceland Ridge. Strong winds and poor visibility due to fog accompanied our work. We succeeded in recovering a mooring in Denmark Strait, that had acquired measurements of the overflow for the duration of twelve months. After servicing the instruments, we re-deployed the mooring at the same location. This way we accomplished to continue the measurements in this key location of the Atlantic Meridional Overturning Circulation that have been operated quasi-continuously since 1996. Unfortunately, an attempt to recover a second mooring was not successful.

For the largest part of the week we then conducted a survey of the spatial distribution of the overflow plume along the continental slope of Greenland downstream of Denmark Strait. For this purpose, the vessel successfully covered 90 stations during which data of the vertical distributions of temperature, salinity, dissolved oxygen and current velocity were collected throughout the entire water column by means of a lowered sensor system (CTD / LADCP). The data show, that the overflow plume sinks to greater depths with increasing distance from Denmark Strait. We will use these observations to calculate to what extent this important current gains in strength by entraining ambient waters along the way. Valuable measurements of the bathymetry (depth soundings by a swath echosounder) complete the observations.

Toward the second half of the week the winds calmed down and the sun re-appeared, allowing for occasional sightings of whales and icebergs floating by in the distance. By Saturday we had completed the survey and conducted an 18 hour-long time series station, in order to investigate the turbulent mixing processes of relatively warm, ambient waters into the cold plume. In spite of strong, variable currents the nautical staff of R/V Merian S. Merian managed skillfully to keep the vessel in position over the entire period. Now that we have completed the first part of the measurement program in Demark Strait, we are in transit toward Scoresby Sound on the east coast of Greenland, where we will work in the next week.

Kind greetings on behalf of the expedition team,

Torsten Kanzow