

ANT XXII/3

Weekly Report No. 4

14.02.05 - 20.02.05

The fourth week of our cruise began with a further biology station in the context of the ANDEEP programme south of Maud Rise. A series of special instruments were used to recover samples of animals living on top of and in the sea floor. The sediment profile imaging system records pictures and movies from the sea floor and even from within the upper part of the sediment layer. Multicorer and box corer cut out samples of different size from the bottom and bring them to the surface together with the water layer on top of it. Epibenthic sledge and Agassiz trawl provide samples from a wider area since they are towed along the seabed. At the beginning of the station a baited trap was deployed to catch amphipods in 4650 m depth. It was successfully recovered at the end of the ANDEEP station. This sequence of instruments, which was used at this station, will be the backbone of the station work at the further ANDEEP stations during the coming week.

After the biology station, physical oceanography continued the work along the section on the Greenwich Meridian. CTD stations were measured every 30 nautical miles where vertical profiles of temperature and salinity and water samples were taken to determine the concentrations of tracers, oxygen, dissolved CO₂, nutrients and salinity. Part of the samples was measured on board and some have to be brought back to the home labs for later analysis.

At the southern end of the transect moorings were recovered and deployed. Moorings are observation systems that remain in ocean up to several years. During this period of time they measure and record water temperature and salinity, current velocity and direction and the sea ice thickness. Mooring deployment is a highly sophisticated operation that requires long experience. The good weather made things much easier to us than we are used to. Since the measurements should characterise the whole water column, our moorings are up to 5 km long. Floatation from steel or glass spheres in 150 m below the sea surface keeps the mooring line upright above the bottom anchor weight. At this line a variety of instruments and further floatation is fixed.

When a mooring is deployed in open water, the upper floatation is first dropped from the ship into the water. Then the ship steams slowly towards the final mooring position and pays out mooring line on which the instruments are fixed. Once the full length of cable and all instruments are floating at the sea surface the ship tows the whole set as long as is needed to the final position. It is a highly delicate operation to slip it just at the right spot, so that the bottom weight sinks to the desired position and keeps the mooring there until its recovery. Between the anchor and the line is an acoustical release. After an acoustical signal from the ship, the release separates the line with the instruments from the anchor. Then the released instruments return to the sea surface where they are

collected from the ship.

The new acoustic POSIDONIA system installed on POLARSTERN proved to be highly advantageous. It allowed us to follow carefully the sinking bottom weight after slipping and the rising of the mooring back to the surface after the release. This technical progress permits to us to position the mooring much more precisely than in the past and highly facilitates the recovery.

On Saturday we passed by Atka Bight on our way to Kapp Norvegia, where the ANDEEP transect across the continental slope off Kapp Norvegia began on Sunday morning. On our way we intended to recover three traps for fish and amphipods, which had been under heavy ice during a cruise a year ago. However, only one fish trap could be recovered. The two others had disappeared since then. Further to the southwest another mooring with a sediment trap deployed a year ago could not be recovered neither. Most likely it has become the prey of one of the many icebergs around that position. On Sunday morning we started the work off Kapp Norvegia where we will stay most of the week.

With the best wishes from all on board
Eberhard Fahrbach