



Maria S. Merian Cruise 2 leg 1

Third weekly report: 05.06 - 11. 06. 2006

We have now covered 3 fourths of the section and we are entering the Irminger Sea. Work performed includes 30 CTD stations, 1 VMP profile and 7 Provor deployments. Meteorological conditions were very good the whole week.

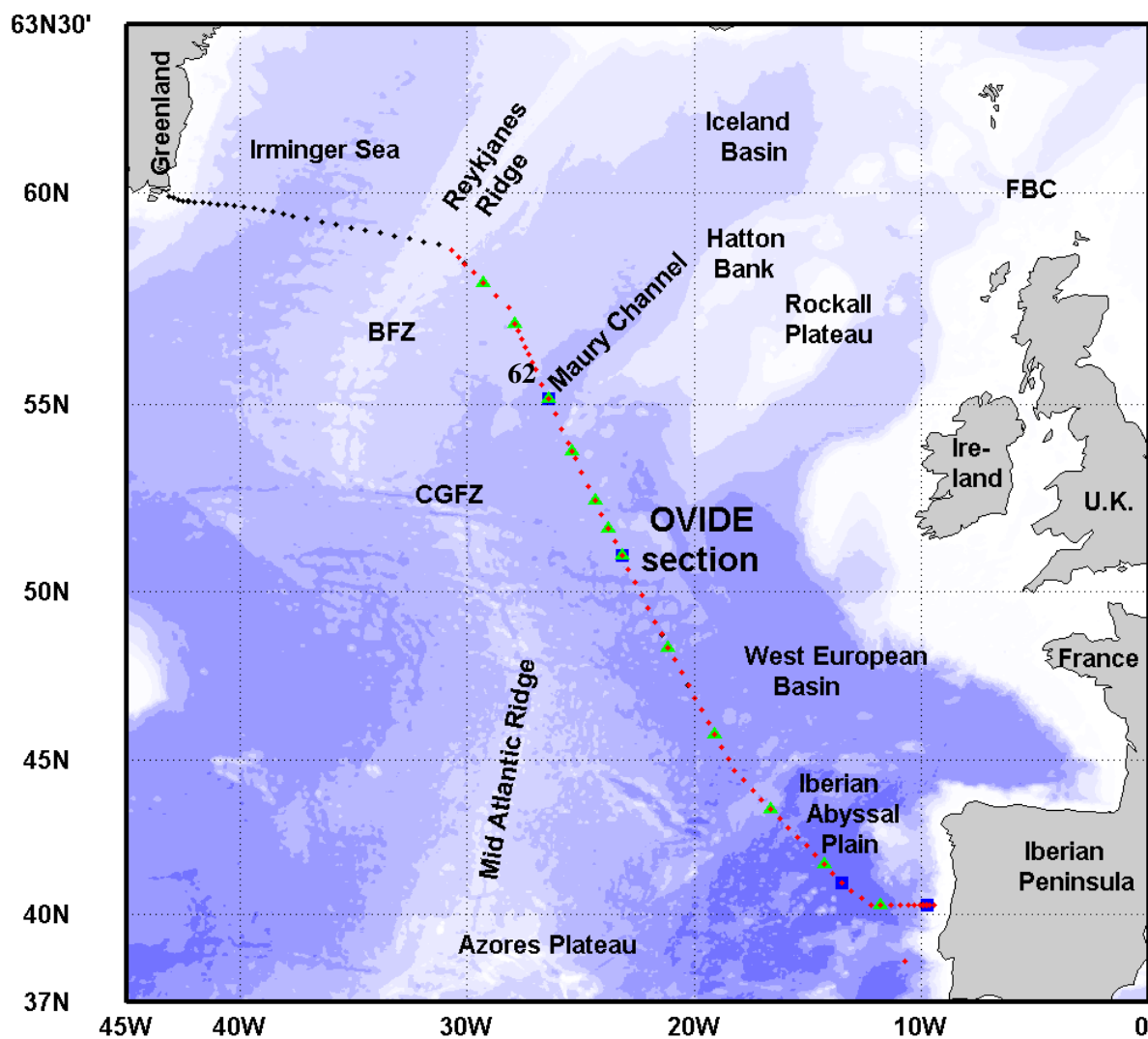


Figure 1: Ovide section planned in 2006. Red dots indicate the hydrological stations performed from May 24 to June 11. The blue squares are the stations where we added a VMP profile, and the green triangles, the stations where we also deployed a profiling float.

We deplore the loss of our VMP and the failure of one of the pods. However, hydrological and ADCP data are excellent, and the main objectives of the survey should be reached by the end of next week.

An example of synthesized data is shown on fig. 2. The fronts clearly stand out between 49°N and 53°N, showing the net north-westward transport of the North Atlantic Current mainly around 50°N. The meanders of the current were better anticipated by the PSY1V2 version of Mercator model (fig. 3) than by its higher resolution version.

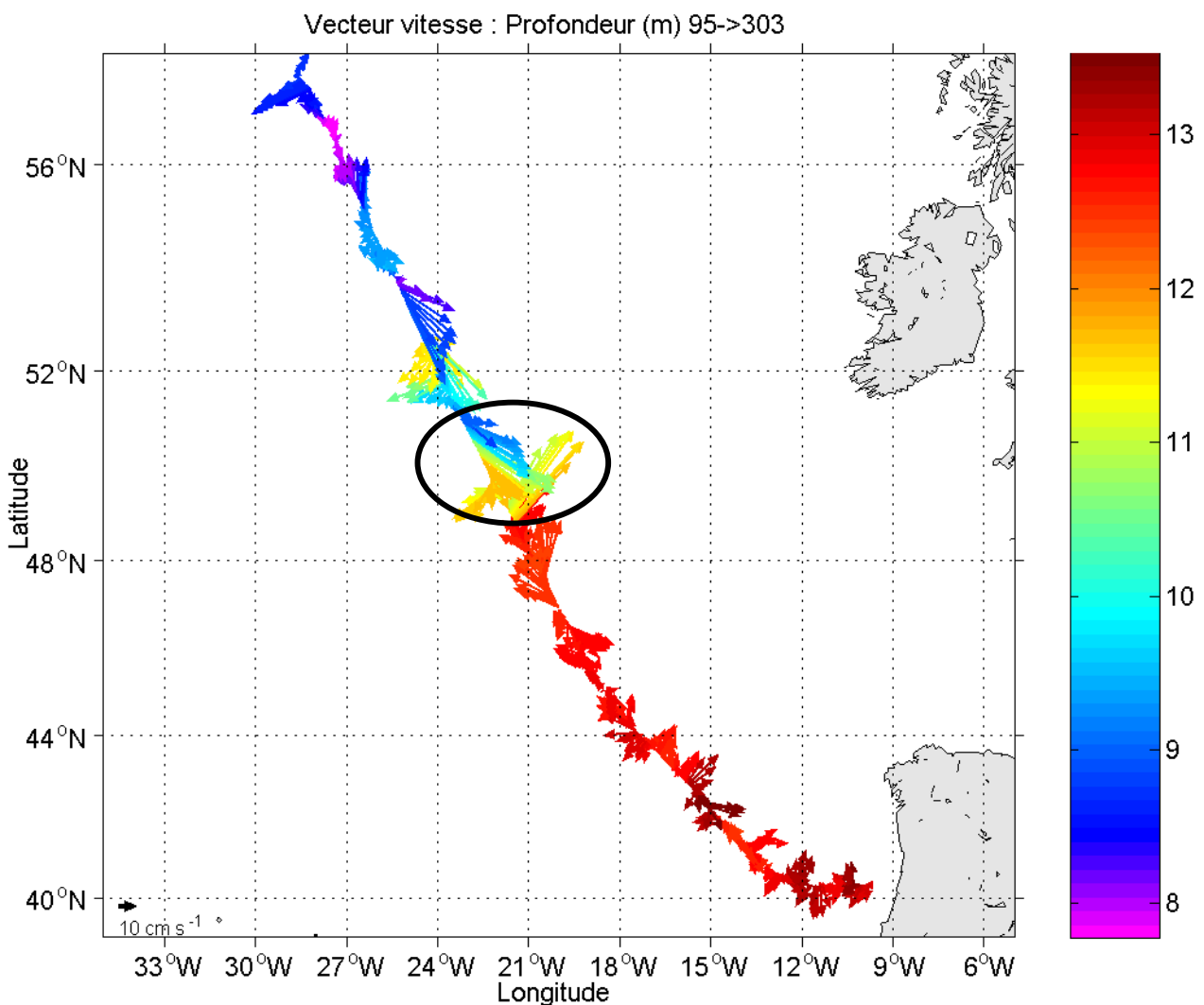


Figure 2: Velocities measured by the ship ADCP and averaged between 95 and 303 meter depths. Color indicates the mean temperature in this layer, that has been interpolated from CTD station data.

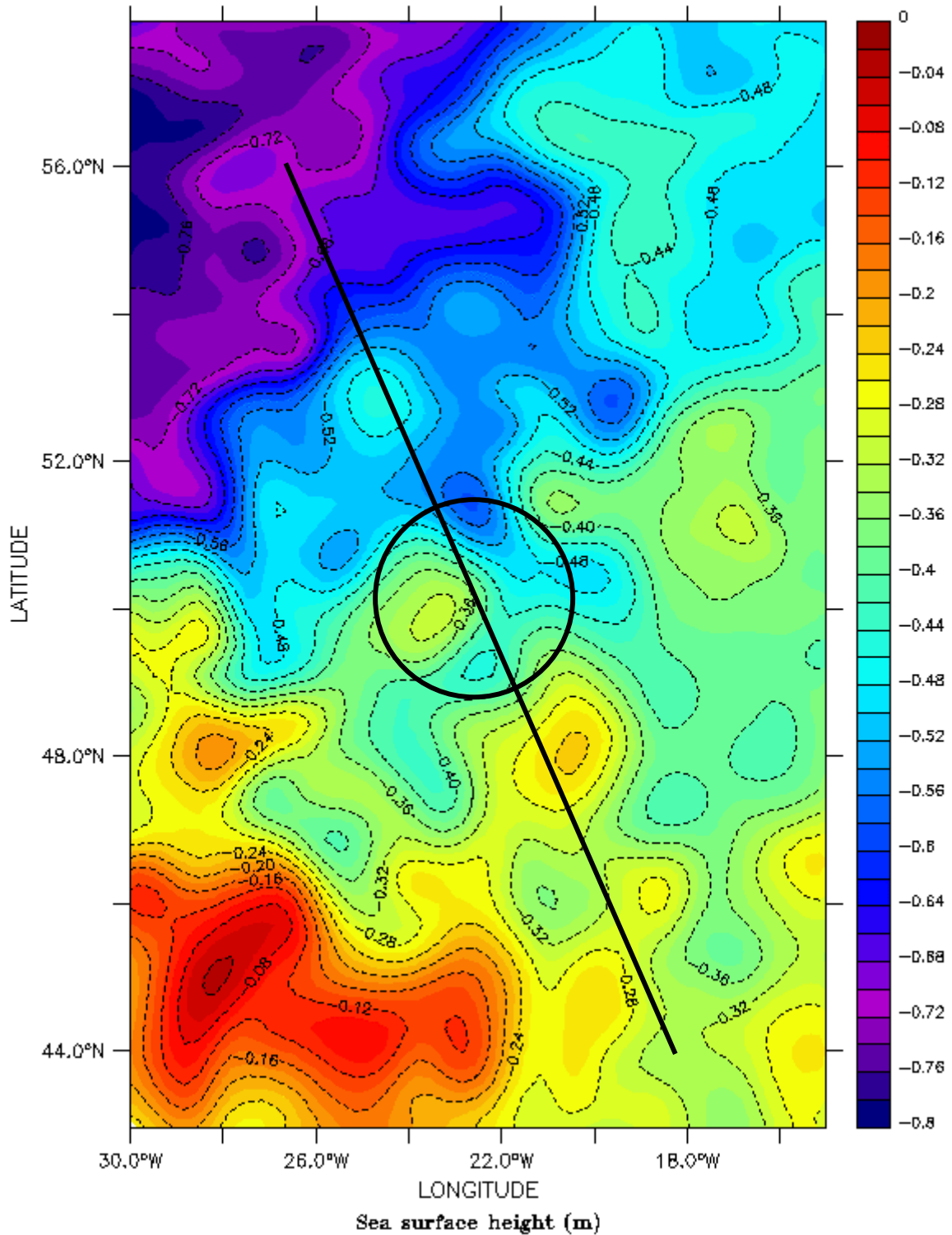


Figure 3: Sea surface height best estimate of the PSY1V2 version of Mercator model. As for an atmospheric pressure chart, surface currents follow the isolines and strong velocities are expected where isolines get closer. Red (purple) areas indicate anticyclonic (cyclonic) circulation.

The LADCP data give us information on the deeper currents. For example, station 62, north of Maury Channel (fig. 1), shows a large south-westward flow at depth, although the first 500 meters flow in the opposite direction. There, the Iceland-

Scotland Overflow Water at the bottom (relative maximum of salinity fig. 6), along with Labrador Sea Water between 1000 and 2000m (minimum of salinity and maximum of oxygen on fig. 6 and 7), are transported around the Reykjanes Ridge. After circulating cyclonically around the Irminger Sea, they merge with the Deep Western Boundary Current at the bottom of the East Greenland Slope.

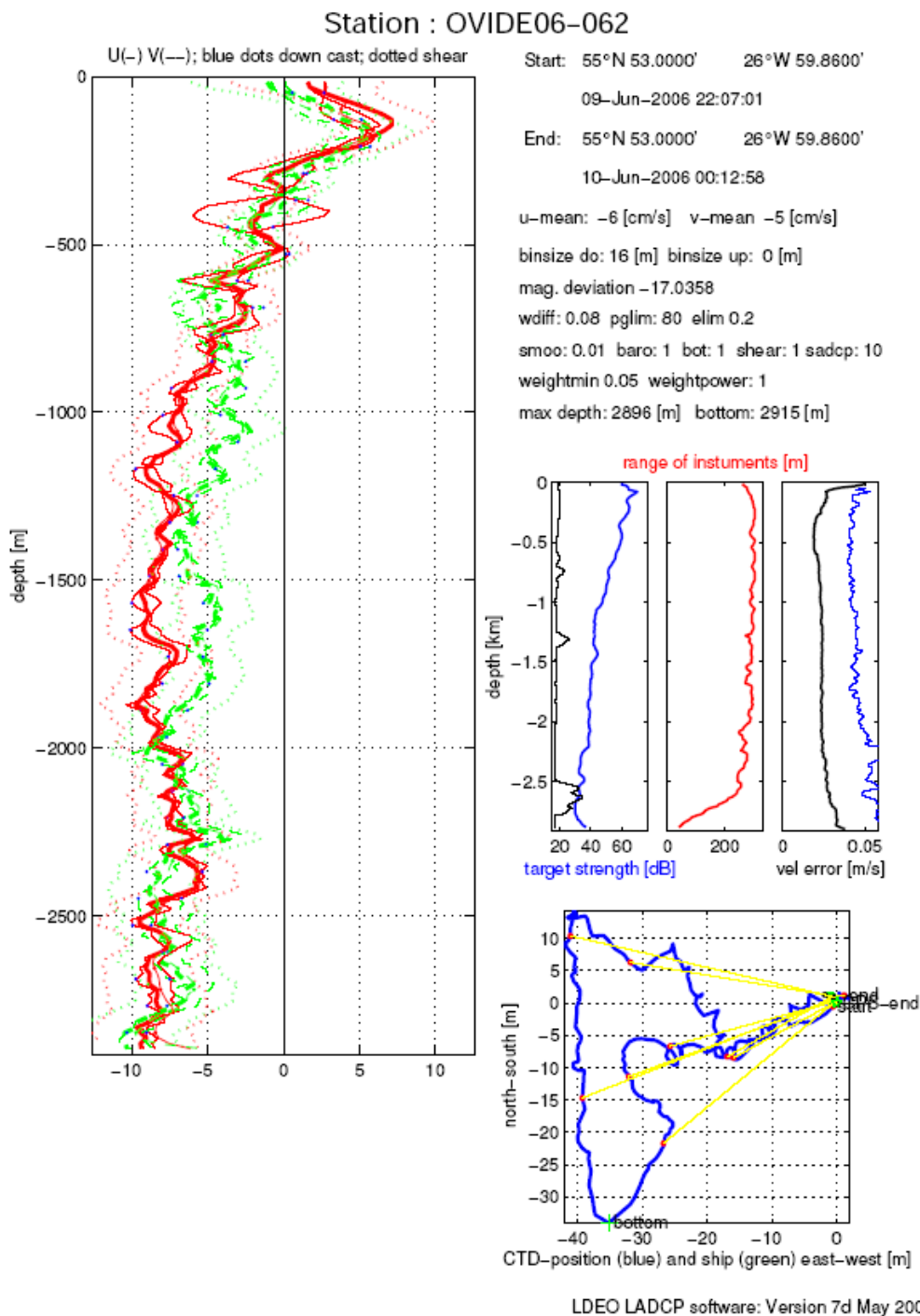


Figure 4: Horizontal velocity profile of station 62 measured by the 150kHz Lowered ADCP and analyzed with Martin Visbeck's software. Zonal velocity in dashed green, meridional in red. Ship ADCP is used to improve the first 500 meters of the profile. The processing include the estimation of the CTD horizontal trajectory, plotted at the bottom-right.

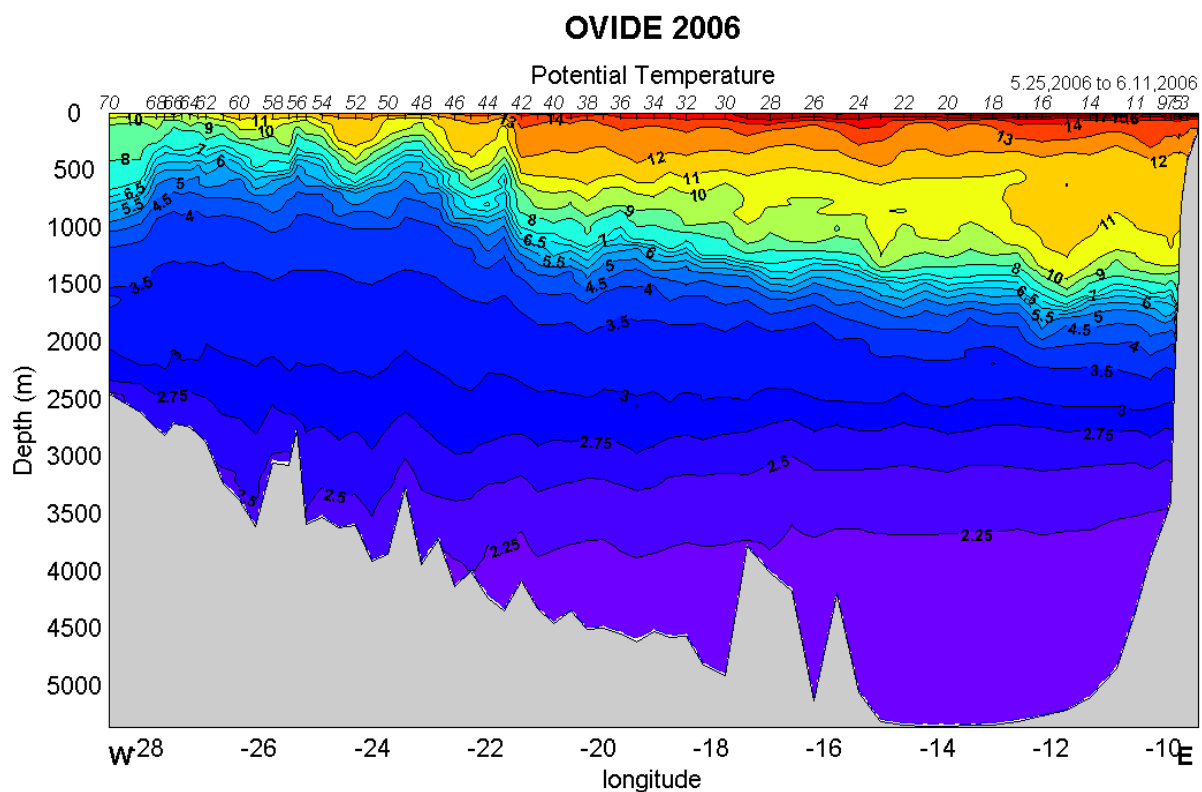


Figure 5: potential temperature section as measured on June 11, 2006.

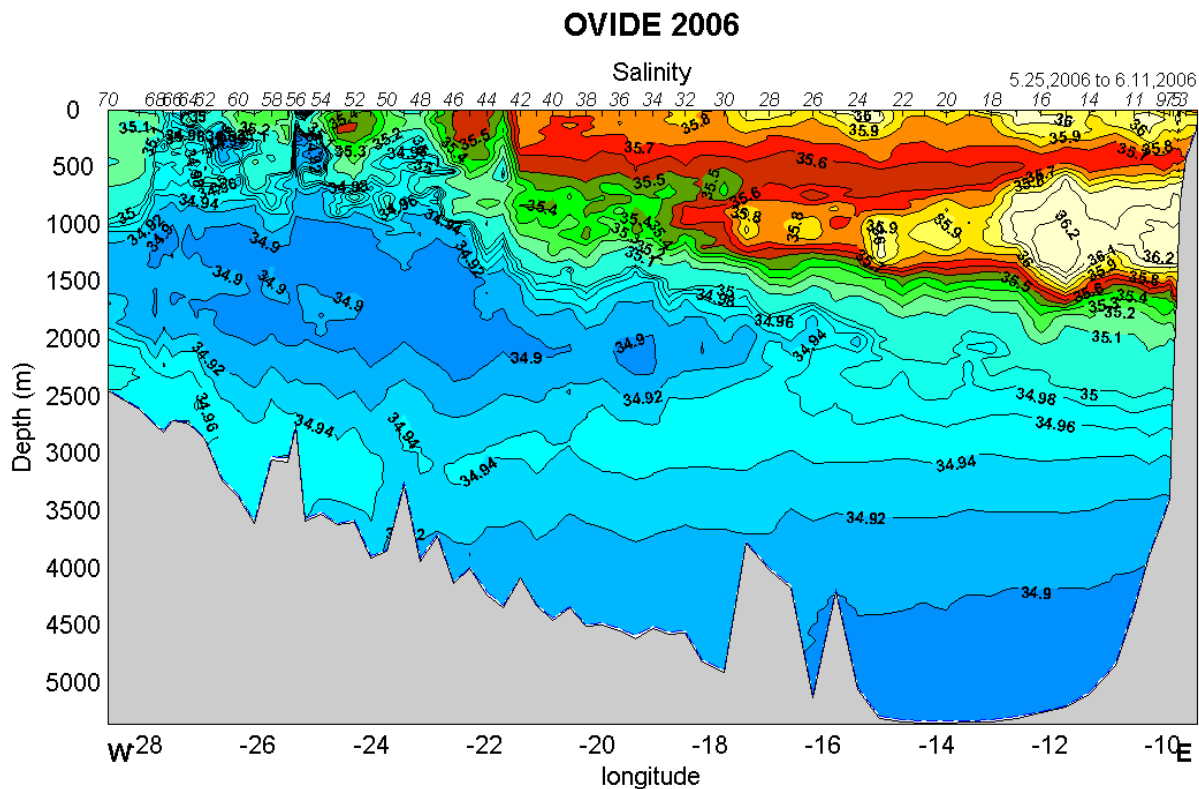


Figure 6: salinity section as measured on June 11, 2006.

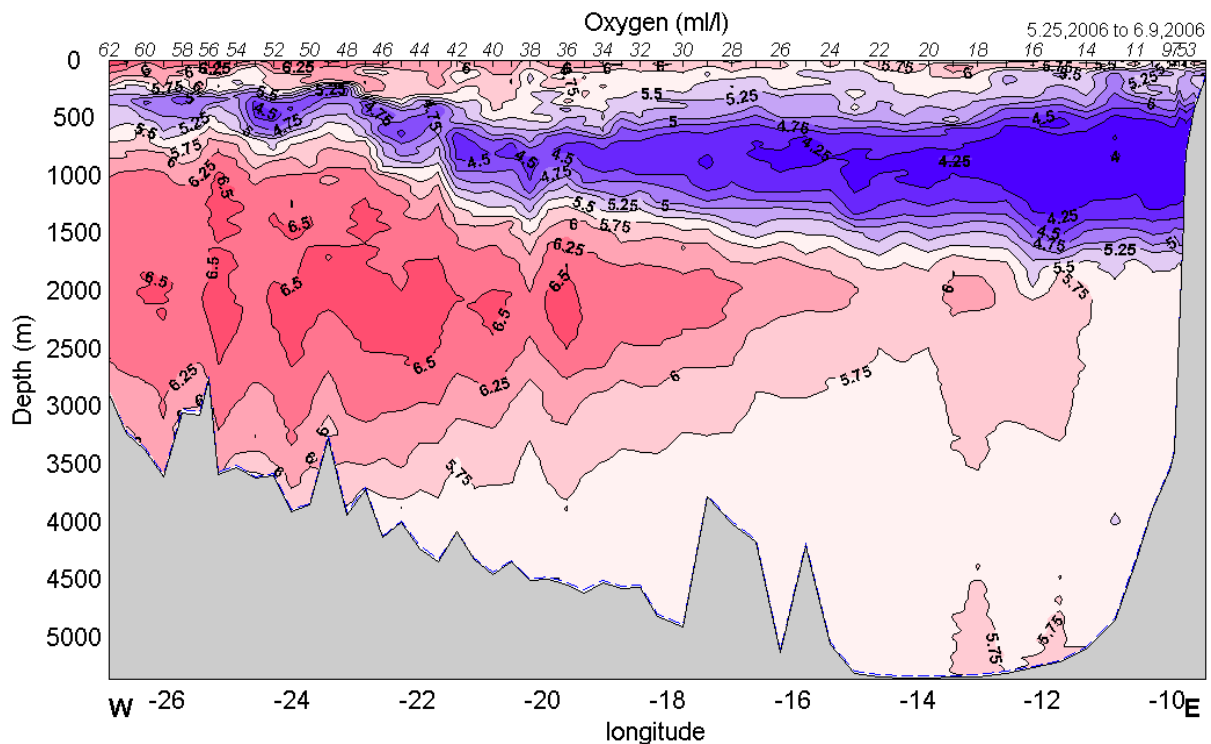


Figure 7: oxygen section as measured on June 11, 2006.

The measurements of next week will bring crucial information in our estimate of the Meridional Overturning Cell, since we will be crossing the Deep Western Boundary Current bringing back dense water that was transformed in the Subpolar Seas.

All the scientists of this mission are most grateful to Captain von Staa and to all the crew aboard the Maria S. Merian.

Bien sincèrement,

Pascale Lherminier et toute l'équipe scientifique à bord du M.S. Merian.