Monitoring the North Atlantic Ocean

Monitoring the North Atlantic Ocean is important for gaining understanding of the processes involving deep water formation and for tracking changes which may occur therein as a result of a changing climate.

The North Atlantic Ocean is a key area for the thermohaline circulation. It is one of the few areas where the transformation of surface waters to deep waters takes place, thereby closing the link between the northward flow of warm surface waters and the southward flow of cold deep waters.

The monitoring of the North Atlantic is done by means of survey cruises and moored instruments. The survey cruises cross the northern part of the North Atlantic, from Labrador to Greenland and from Greenland to Ireland, nearly annually. These cruises, which started in 1990 as part of the World Ocean Circulation Experiment, offer insight into the interannual to decadal variability.

In September 2003, the NIOZ also deployed two moorings on the survey line east of Greenland. The instruments in the moorings monitor the currents and the vertical temperature and salinity structure of the water column on a daily basis. These daily measurements, which now form a 5 year long record, indicate that the variability at intra-annual time scales is of equal size as the interannual variability in this region. Information of both the interannual and daily time scales must be combined to fully understand the processes responsible for the variability of the North Atlantic, especially the variability in deep water formation.

With the Royal Netherlands Meteorological Institute (KNMI), a partner in the CS01 project, the observations from the monitoring project have been compared to simulation of the North Atlantic Ocean of Coupled Climate Models. This comparison shows that the deep water formation in the models could also be improved upon.

FEMKE DE JONG
Drs. Femke de Jong finished her study in Physical Oceanography and Meteorology at Utrecht University in 2004. She started her PhD study at the Royal NIOZ in which she investigates on the variability of the northern North Atlantic Ocean on a range of time scales. Special focus in this study lies on convective or deep mixing in the Irminger Sea.
+31 222369412 / femke.de.jong@nioz.nl

HENDRIK VAN AKEN
Dr. Hendrik M. van Aken obtained his Masters degree in Geophysics (Physical Oceanography and Meteorology) in 1981 at the University of Utrecht, where he also obtained his PhD. He is currently head of the Physical Oceanography department of the Royal NIOZ. His research focuses on the large scale ocean circulation and its role in climate, but also on climate variation in the Wadden Sea.

PROJECT: CS01 – North Atlantic Ocean modelling and monitoring

PARTNERS: Royal Netherlands Institute for Sea Research (Royal NIOZ) / Royal Dutch Meteorological Institute (KNMI) / Utrecht University / Institute for Marine en Atmospheric research Utrecht (IMAU)

The NIOZ research vessel Pelagia. The R/V Pelagia is used for the survey cruises and the deployment and recovery of the moorings.