



Monitoring the exchanges between the Atlantic and the Arctic across the Greenland-Scotland Ridge

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The Arctic Mediterranean (the Arctic Ocean and the Nordic Seas) receives a continual input of warm water from the Atlantic Ocean. This Atlantic inflow supplies about 90% of the total inflow to the region and keeps large areas much warmer than they would otherwise have been and free of ice. In the Arctic Mediterranean, the imported Atlantic water is cooled and freshened. It returns to the Atlantic, partly in near-surface layers on both sides of Greenland, and partly as a deep overflow of cold, dense water that crosses the Greenland-Scotland Ridge. After crossing the ridge, the overflow water entrains ambient water and sinks into the depths of the Atlantic where it becomes the main contributor to the North Atlantic thermohaline circulation. Some climate models indicate that anthropogenic climate warming may induce a substantial weakening of these flows in the 21st century (IPCC, 2007). If this were to happen, large ecological and societal impacts may be expected (ACIA, 2005) and monitoring the characteristics and intensity of the exchanges is therefore a high priority task. To fulfill this task, a group of European marine research institutes have implemented a monitoring system,

including regular research vessel cruises and quasi-permanent moorings with self-recording current meters and other instruments. This system has been developed over the last decade and has provided time-series of the characteristics and intensity of the exchanges. The field-work has mainly been carried out by national fisheries research institutes, but a number of other European institutes have been involved. Funding has been supplied by grants from national, Nordic, and European research funds, most recently within the THOR (Thermohaline Overturning – at Risk?) project, which has been funded by the European Framework Programme 7, but future funding of the monitoring system is unclear.