Geophysical Research Abstracts, Vol. 7, 03395, 2005
SRef-ID: 1607-7962/gra/EGU05-A-03395

Mixing in the overflow across the Wyville Thomson ridge

T.J. Sherwin (1) and W.R. Turrell (2)

(1) Scottish Association for Marine Science, Dunstaffnage Marine Laboratory, Oban, Argyll, UK PA37 1QA (toby.sherwin@sams.ac.uk), (2) Fisheries Research Services Aberdeen Laboratory, PO Box 101, Victoria Road, Aberdeen AB11, UK 9DB

As the plume descended its temperature near the sea-bed warmed by over 3 °C in about a day. Although the slope was quite steep (0.03), the mean speed of the current (typically 0.36 m/s) was too slow for significant entrainment of NAW to occur (the bulk Richardson number was of order 5). However, very large overturns (up to 50 m) were evident in some CTD profiles, and it is demonstrated from Thorpe scale estimates that the warming of the bottom waters was due to mixing within the plume. It is likely that some of the NSDW had mixed with NAW before it crossed the ridge. The route of the overflow through the gully made it descend more rapidly to great depth (1700 m) than other overflows in the North Atlantic. The water that flowed into the northern part of the Rockall Trough had a temperature profile that ranged from about 3 °C to 8 °C. Water with a temperature of $>$ 6 °C probably escaped into the Iceland Basin, between the banks that line the north-western part of the Trough. Colder water ($<$ 6 °C) must have travelled down the eastern side of the Rockall Bank, and may have had a volume flux of up to 1.5 Sv.