



Export of Labrador Sea Water from the Subpolar North Atlantic along the Western Boundary: New Float Results

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In the 1990s, profiling floats at the Labrador Sea Water (LSW) level drifting southward along the western limb of the subpolar gyre showed a strong tendency to leave the boundary and drift eastward along the subpolar front rather than to continue equatorward around the Grand Banks. This was surprising in light of tracer observations which implied that the predominant export pathway for LSW from the subpolar to subtropical region was along the western boundary. In 2003, we began a three-year seeding program with acoustically-tracked (i.e., completely subsurface) floats to (1) verify the profiling float observations, (2) document any seasonal and/or interannual variability in export pathways of LSW and (3) elucidate the eddy processes that determine the export pathways. Six floats are being deployed every three months over the continental slope near 50N, three each at 700 m and 1500 m, for a total of 72 floats. So far 11 floats have surfaced after successfully completing two-year missions. Only two (both at 700 m) were exported to the subtropical gyre, while the others all left the western boundary east of the Grand Banks and drifted northward and/or eastward (similar to the profiling floats). Two 700 m floats drifted through the 1100-m deep Flemish Pass, while the others all passed around the seaward flank of Flemish Cap before they left the slope and drifted into deep water. Some floats left the slope preferentially at the southeastern flank of Flemish Cap. Sea surface height anomaly and sea surface temperature fields are being analyzed to test the hypothesis that shoreward meanders of the North Atlantic Current at Flemish Cap may temporarily block the southward progression of floats (and LSW) along the continental slope.