Subpolar-to-Subtropical Connections: Labrador Sea Water Spreading Pathways (Continued)



Amy Bower (WHOI)

Susan Lozier and Stefan Gary (Duke University)



RAFOS Displacement Vectors 700 (red) and 1500 (blue)



Criticisms

- Floats released too far offshore—outside of or at edge of DWBC
- Floats were isobaric—if isopycnal would have 'stuck' to the DWBC in greater numbers
- Simulated isopycnal floats in a highresolution numerical model (FLAME) show similar result as RAFOS—model is not realistic representation of circulation

Does cross-slope position matter?





RAFOS Release Sites





Relative Displacements of Isotherms and Isobaric Floats (from Shaw and Rossby, 1984)





An Example of Float/LSW Detachment from the Continental Slope: Float 673 at 1500 m









Importance of Mesoscale Variability





Spreading with time of simulated 3-D trajectories using:

(left) model mean velocity field

(right) time-varying model velocity fields





EKE in FLAME Compared to AVISO and Drifters



Two-Year Destination Statistics



Summary

- RAFOS floats released across width of DWBC at 50N—*not* biased by release position to follow interior pathways
- Detachment of LSW from the slope of the Grand Banks is a 2-D process—well-captured by isobaric RAFOS floats
- FLAME reproduces major circulation features around Grand Banks, giving more support for simulated float results
- Mesoscale variability of the Gulf Stream around the Grand Banks has profound impact on LSW spreading pathways