

Dr. Amy Bower: Atlantic Climate and Circulation Experiment

Warm Water Pathways and Intergyre Exchange

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Project Summary

The North Atlantic Current, which transports subtropical water northeastward from the Gulf Stream, and the Poleward Eastern Boundary Current, which carries Mediterranean Outflow Water northward along the European continental slope have been proposed as the two most likely sources of the warm, salty water that is transformed into intermediate and deep water in the subpolar region. We studied the circulation in this region using isopycnal, acoustically-tracked RAFOS floats that were deployed in these two currents with the overall goal of describing the pathways of warm water towards the subpolar region. Our specific objectives were to 1) provide a quantitative description of the bifurcation of the North Atlantic Current east of the Mid-Atlantic Ridge; 2) assess the importance of meridional eddy fluxes, compared to large-scale advection, in the northward flux of heat and salt in the northeastern North Atlantic; and 3) establish the degree of continuity of the Poleward Eastern Boundary Current to the entrance to the Norwegian Sea and the fate of the Mediterranean Outflow Water carried by this current.

Manuscripts



[Discrete eddies in the northern North Atlantic as observed by looping RAFOS floats.](#)

Shoosmith, D. R., P. L. Richardson, A. S. Bower, and H. T. Rossby, 2005. *Deep Sea Research II*, 52, 627-650.

[Directly measured mid-depth circulation in the northeastern North Atlantic Ocean.](#)



Bower, A. S., B. Le Cann, T. Rossby, W. Zenk, J. Gould, K. Speer, P. Richardson, M. D. Prater, and H.-M. Zhang, 2002. *Nature*, 419, 603-607.

Movies of Sea Surface Height and RAFOS Float Trajectories



[Eastern Boundary Floats](#)

[Iceland Basin Eddy](#)



[Crossing Mid-Atlantic Ridge](#)



Non-Referreed Publications

Bower, A. S., P. L. Richardson, H. D. Hunt (WHOI), T. Rossby, M.D. Prater, H.-M. Zhang, S. Anderson-Fontana, P. Perez-Brunius, and P. Lazarevich (URI), 2000. Warm Water Pathways in the Subpolar Region: An overview of the ACCE RAFOS Float Program. *International WOCE Newsletter*, March 2000.

T. Rossby, M.D. Prater, H.-M. Zhang, S. Anderson-Fontana, P. Perez-Brunius, P. Lazarevich (URI), Bower, A.S., P. L. Richardson, and H. D. Hunt (WHOI), 2000. Warm Water Pathways in the Subpolar Region: Some Case Studies. *International WOCE Newsletter*, March 2000.

Posters



[Directly-measured mid-depth circulation in the Northeastern North Atlantic Ocean](#)

Bower, A. S., B. LeCann, T. Rossby, W. Zenk, J. Gould, K. Spear, P. L. Richardson, M. D. Prater, and H.-M. Zhang, 2002. Presented at WOCE, March 2002.

[Looping ACCE RAFOS Floats in Eddies](#)



Richardson, P. L., D. Slater, A. S. Bower, and H. T. Rossby, 2001. Presented at AGU, Spring 2001.

Technical Reports



[Warm Water Pathways and Intergyre Exchange in the Northeastern North Atlantic: ACCE RAFOS Float Data Report, November 1996-November 1999](#)

Furey, H., A. Bower, and P. Richardson, 2001. WHOI Tech. Report WHOI-01-17, 153 pp.

[Investigating Eddies in North Atlantic RAFOS Float Data](#)



Slater, D., A. Bower, and P. Richardson, 2001. Woods Hole, MA, 50 pp.

Data Sets

[WFDAC Subsurface Float Data Archive](#)

Subsurface Float Data Assembly Center: storage center for subsurface float data, from 1972 (Rossby, MODE) through 1998 (Fratantoni/Richardson, North Brazil Current).

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