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65°N -

55°N

50°N -

 $45^{\circ}N$

65°N -

SUMMARY

years) of the float data were in trapped in eddies just upstream eastern boundary. loopers. One hundred eight loop- (west) of the Charlie Gibbs (52N)

ACCE RAFOS float trajectories ers were identified in 96 different and Faraday (50N) Fracture Zones 65°N near the 27.5 density level were an- eddies. Roughly half of the eddies which seem to be preferred routes alyzed to investigate discrete ed- were cyclonic (49%) and half were for flow crossing the mid-Atlantic dies in the northern North Atlan- anticyclonic (51%), although the Ridge. Six floats looped in five antic with the objective of determin- percentages varied in different re- ticyclones which translated southing their geographical distribution gions. Some eddies were station- westward away from the eastern 60°Nand characteristics. Floats that ary for long times (over a year) boundary near the Goban Spur made two or more consecutive and others clearly translated, of- near 47N-50N. These could have loops in the same direction (loop- ten in the direction of the general been weak Meddies forming from ers) were considered to have been circulation as observed by non- remnants of warm salty Med Wain an eddy. Overall 16% (25 float looping floats. Several floats were ter advected northward along the 55°N-



1. ACCE RAFOS Float Trajectories

Looping ACCE RAFOS Floats in Eddies

116 RAFOS float trajectories—URI floats in red, WHOI floats launched near the Mid-Atlantic Ridge in blue and near the eastern boundary in green. Circles show $45^{\circ}N$ launch locations. Floats launched in the NAC tended to drift northeastward and floats launched along the eastern boundary tended to drift northwestware north of Porcupine Bank (52N) and southwestward south of Porcupine Bank. Many floats drifted in a clockwise around minger Basin.





two or more consecutive loops in the same direction. 108 loopers were identified in 96 different eddies, 49 anticyclones and 47 cyclones. Four anticyclones and 3 cyclones had more than one float looping in them.

3. Number of Anticyclonic and Cyclonic **Eddies in 4** Areas in the North Atlantic



60°N -55°N 50°N 45°N

4. Eddy Translation



 $40^{\circ}W$ $20^{\circ}W$ $10^{\circ}W$



Displacement vectors of translating eddies using records of at least 30 days and 3 loops. Eddy translations appear to be due to a) self-advection, b) advection by background currents (as observed by non-looping floats) which often appear to be constrained by sea floor topography, and c) interactions with other eddies. Several other eddies remained nearly stationary for long times in the Iceland Basin and west of the Mid-Atlantic Ridge near the Charlie Gibbs and Faraday Fracture Zones.

5. Eddies with Multiple Floats



oping float in them. Top panel shows the locations of the eddies. Bottom panel shows the individual float trajectories in each eddy.



6. Anticyclonic Eddy in the Iceland Basin

Three floats looped in a stationary anticyclone in the Iceland Basin for 14 months. In mid-December 1998 float 569 was entrained into another anticyclone which translated toward the first eddy and merged with it in January, 1999.





7. Meddy-like Anticyclones



floats looping in five ted southwestward away warm salty Med Water advected northward along the eastern boundary. possible formation mecha nism is the sharp direction change of the boundary near the Goban Spur.

8. Eddies Near Fracture Zones



Floats looping in anticyclones (red) and cyclones (blue) just upstream of the Charlie Gibbs (52N) and Faraday (50N) Fracture Zones, which seem to be preferred routes for flow crossing the Mid-Atlantic Ridge. By the end of October 1997, 3 floats became trapped in an anticyclone near 50N 35W which lasted for at least 9 months, positioned over slightly higher topography that its surroundings. In March 1998 two cyclones translated eastward around the perimeter of the anticyclone as though they were advected by the larger eddy's swirl velocity. In late July 1998 an anticyclone and a cyclone formed a dipole near 52N 37W.

OS32F-196