Overflow Water Pathways in the Subpolar North Atlantic Observed with Deep Floats

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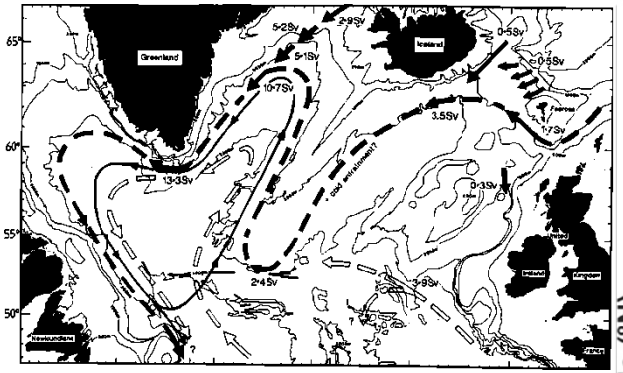
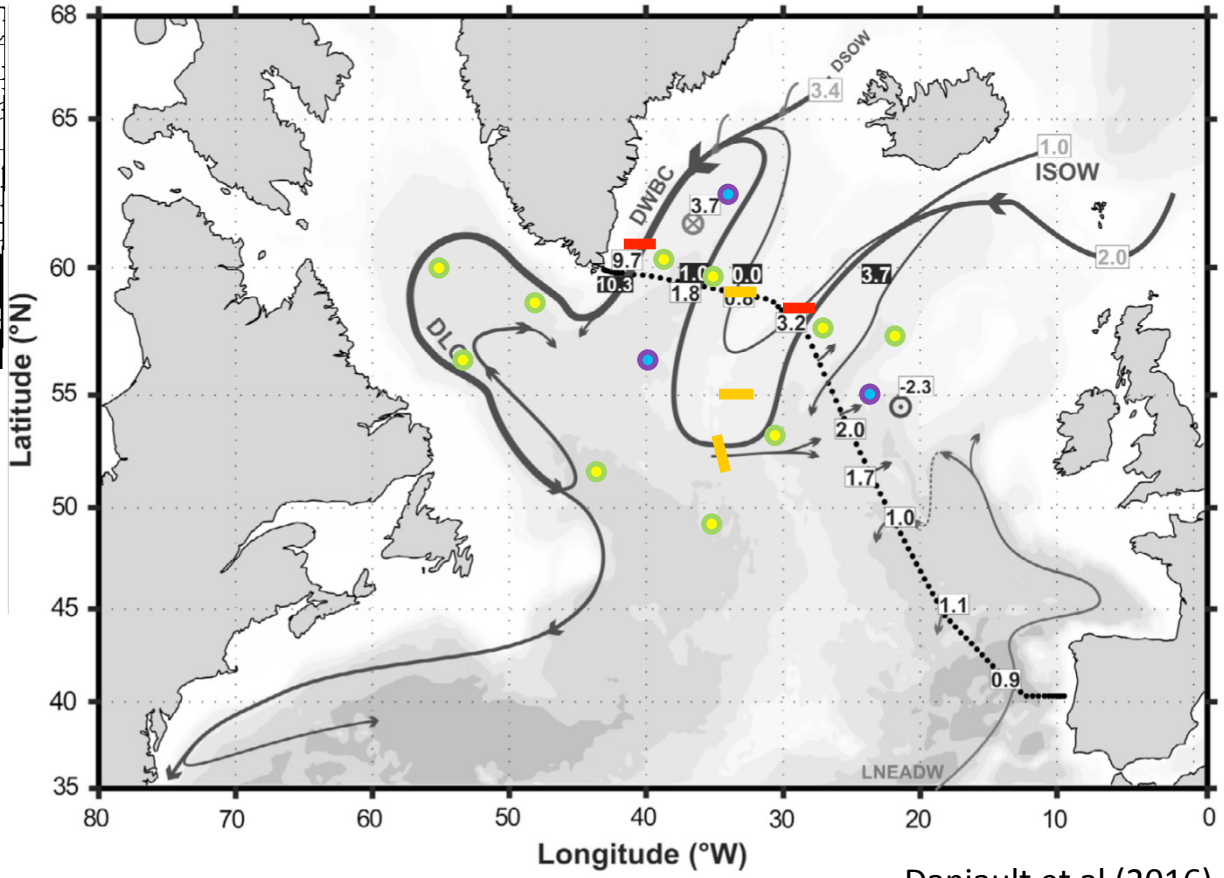


Dickson and Brown (1994)

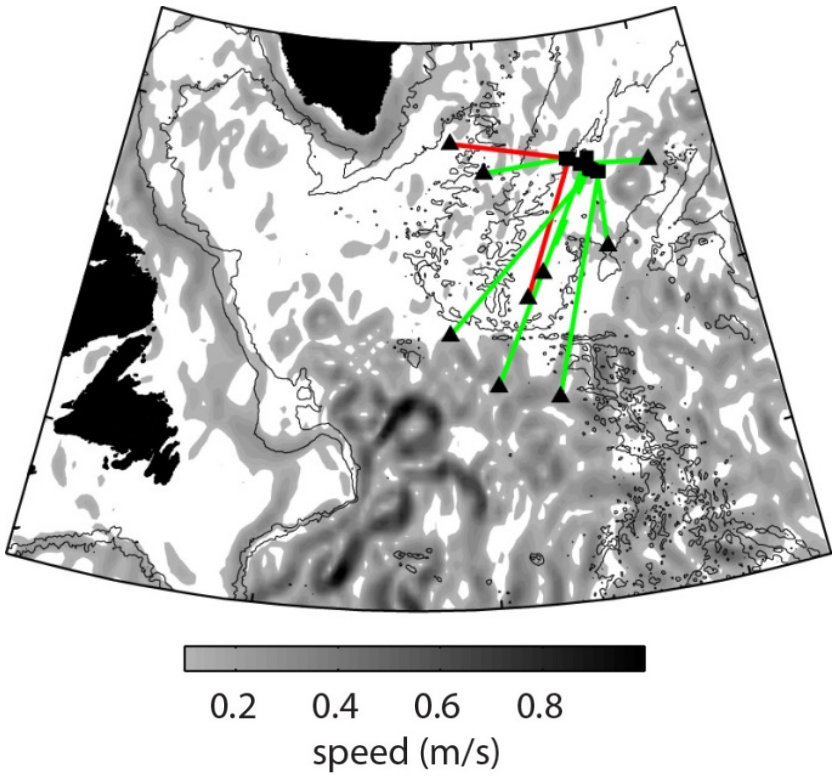


Daniault et al (2016)

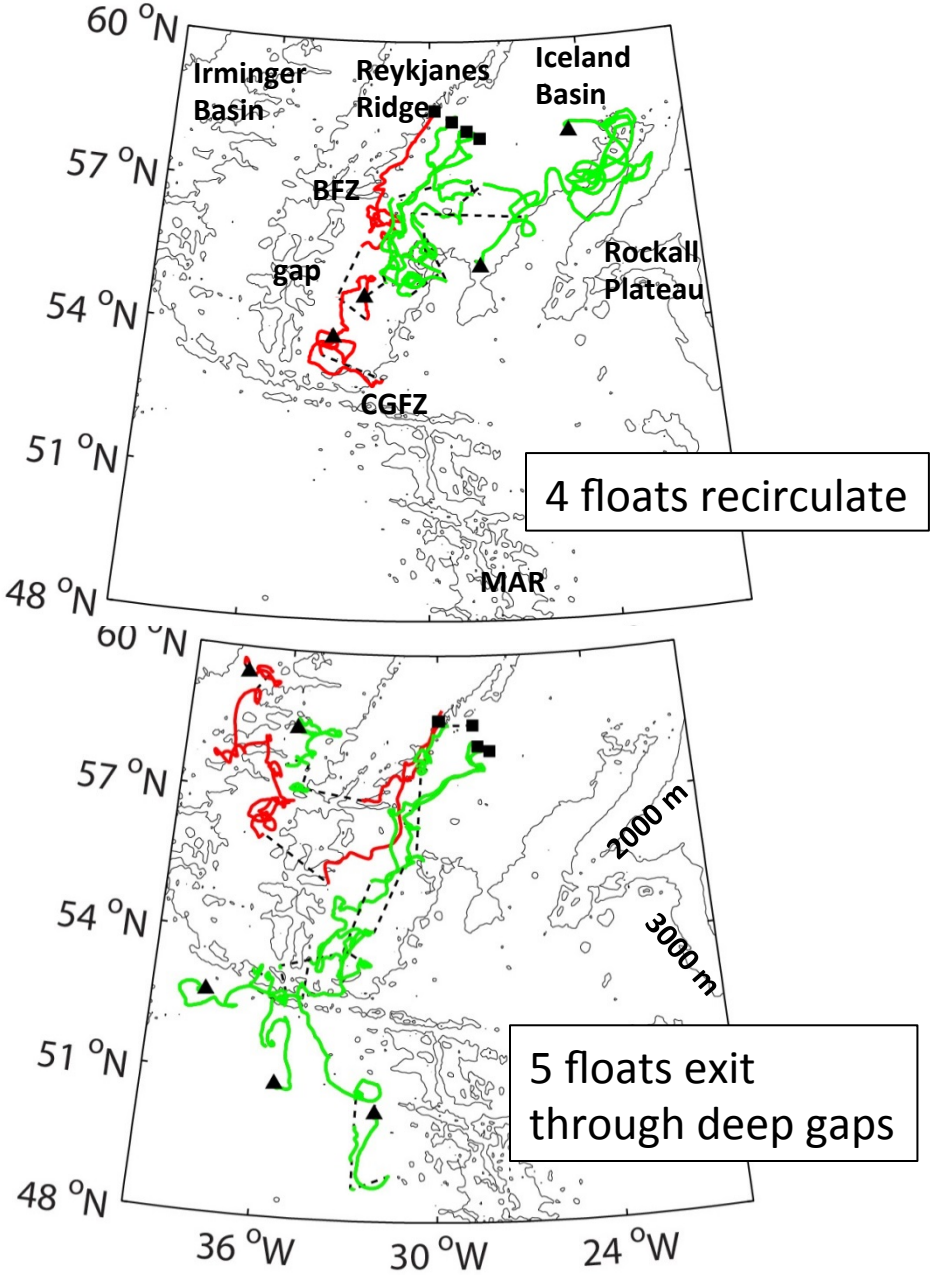
OSNAP Float Program Description

- 120 RAFOS floats deployed 2014-2017
- 5 sites, 4 around Reykjanes Ridge and 1 east of Greenland
- acoustically tracked through 2018 with 13 sound sources
- floats ballasted for 1800-2800 m, density greater than 27.8
- floats deployed 100-200 m above the sea floor
- position, temperature and pressure collected once daily
- default float mission is 2 years
- some tracking issues in winter

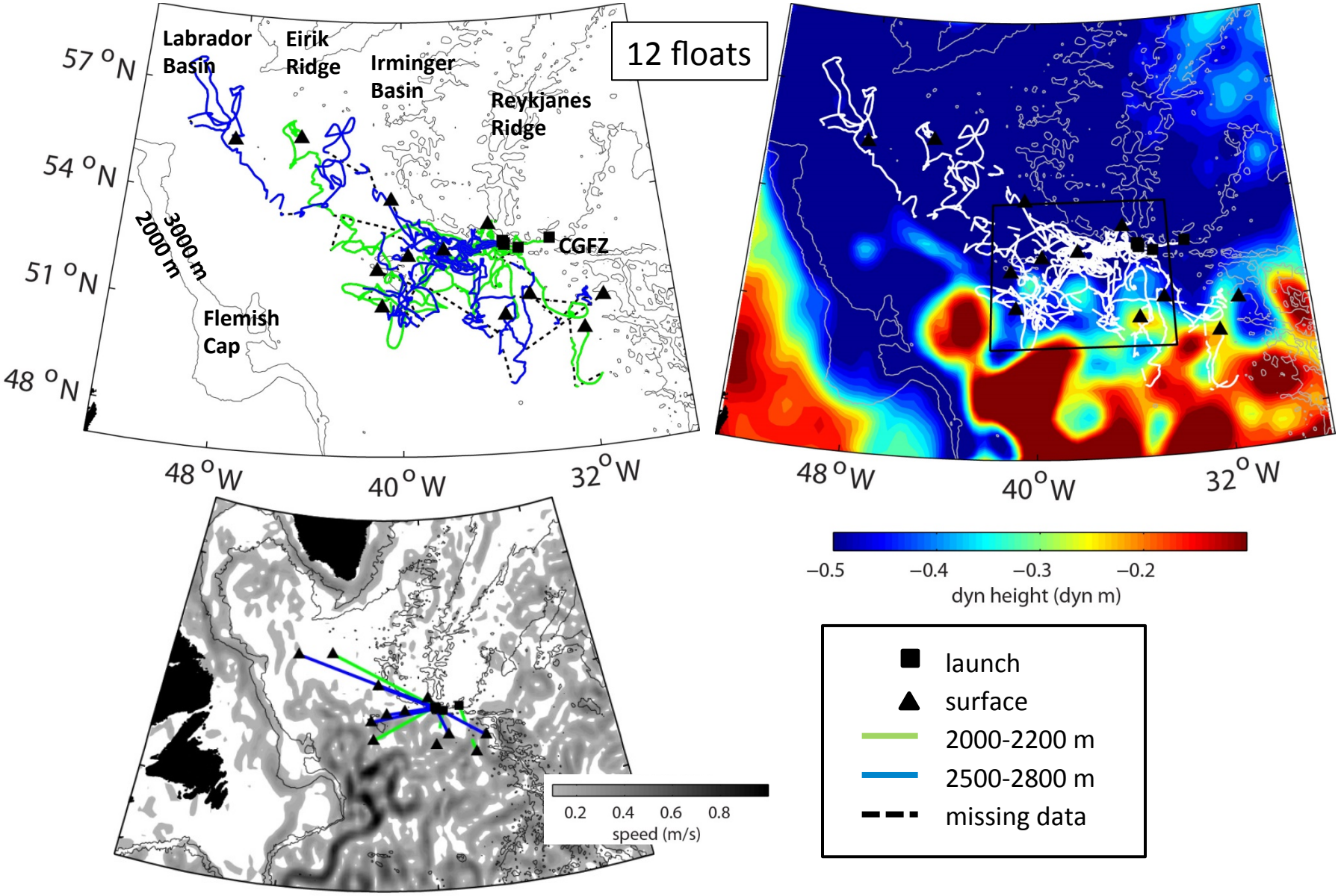
ISOW Pathways in the Iceland Basin



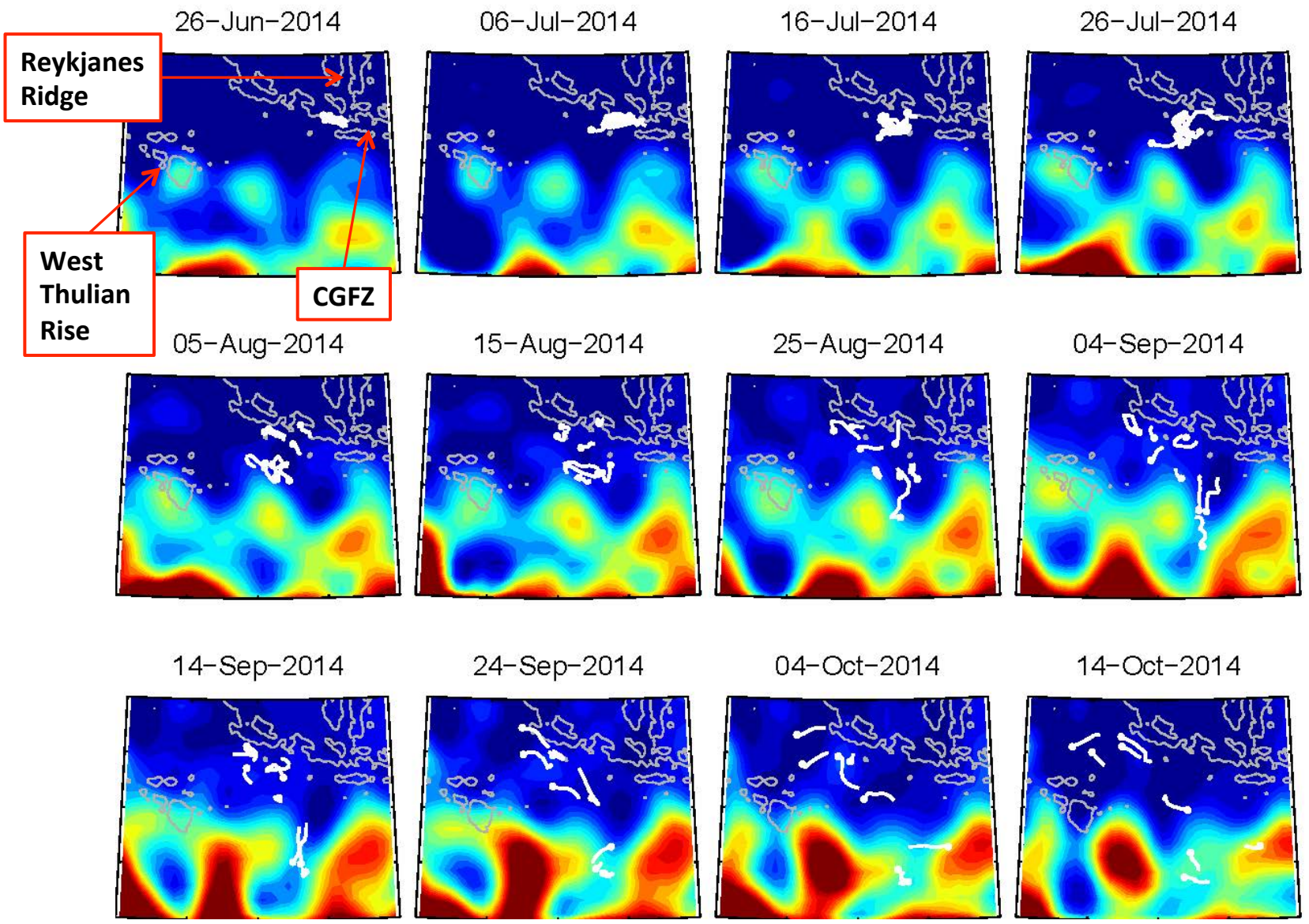
launch
surface
1800 m
2000-2200 m
missing data



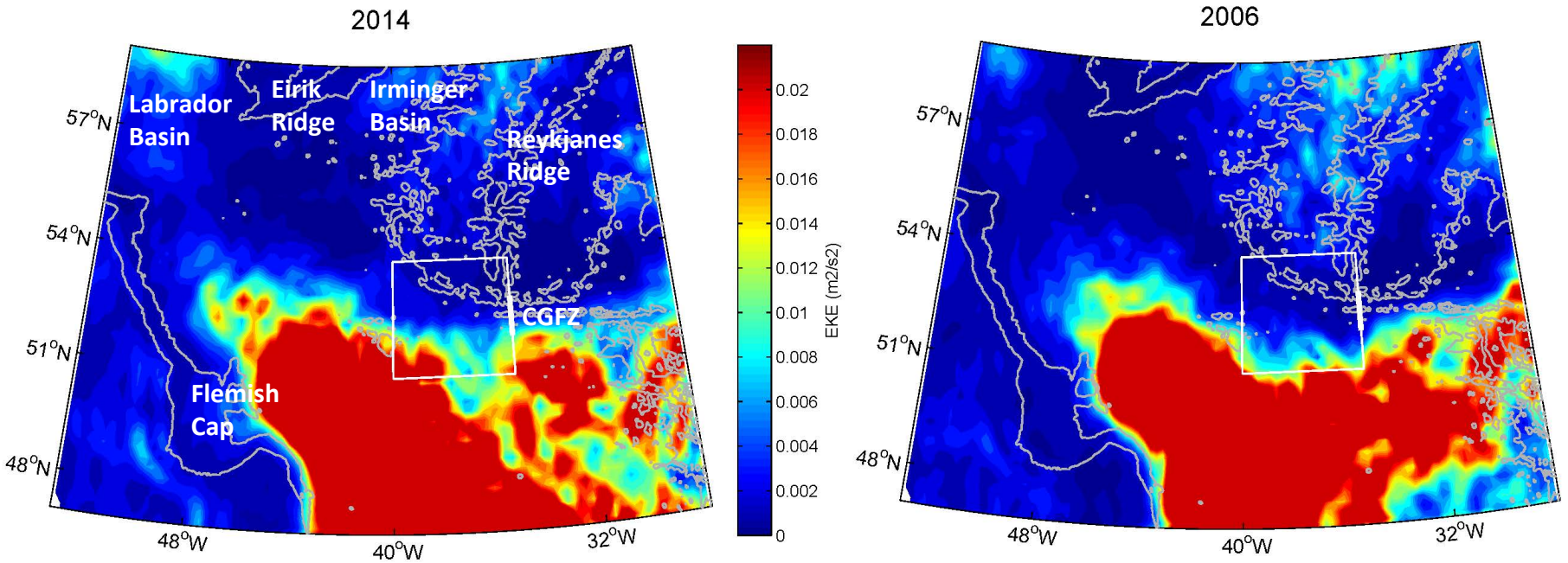
ISOW Pathways From CGFZ



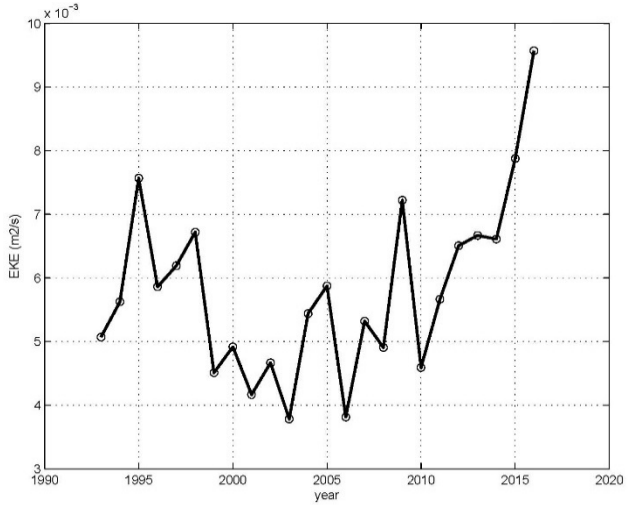
ISOW Pathways and the North Atlantic Current



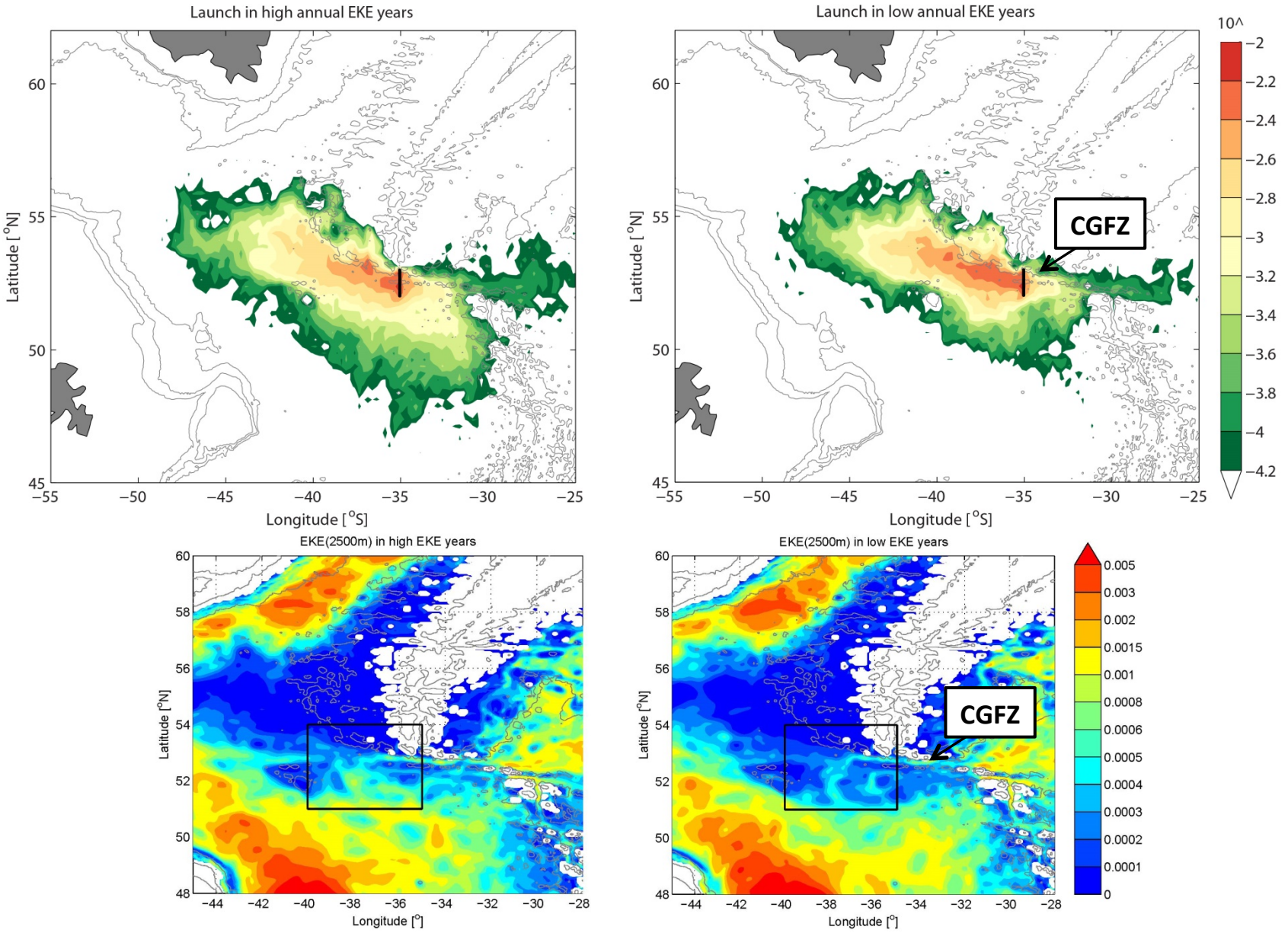
Inter-annual Variability in Surface EKE West of CGFZ



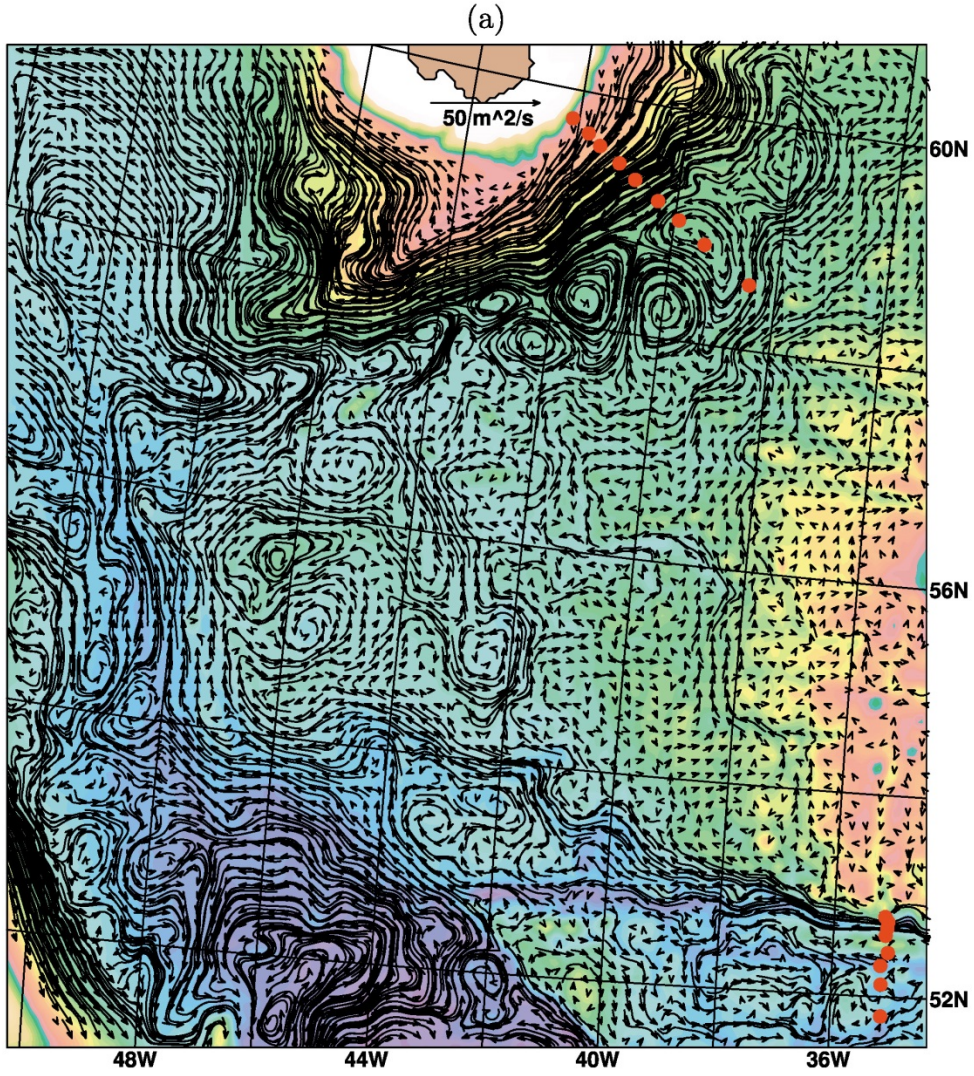
Time series of annual average EKE in box west of CGFZ

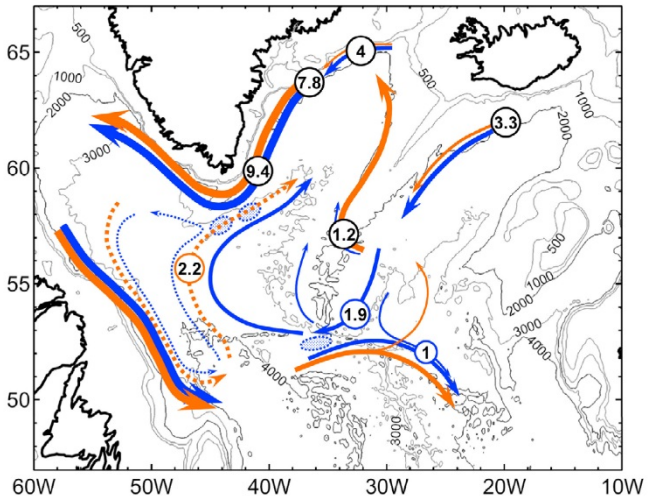


ISOW Spreading Pathways from CGFZ in FLAME



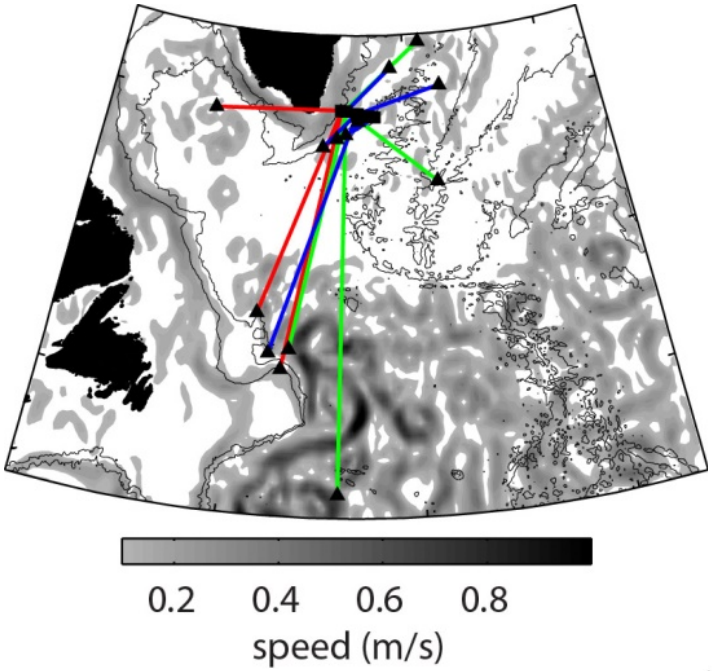
ISOW Spreading Pathways from CGFZ in HYCOM



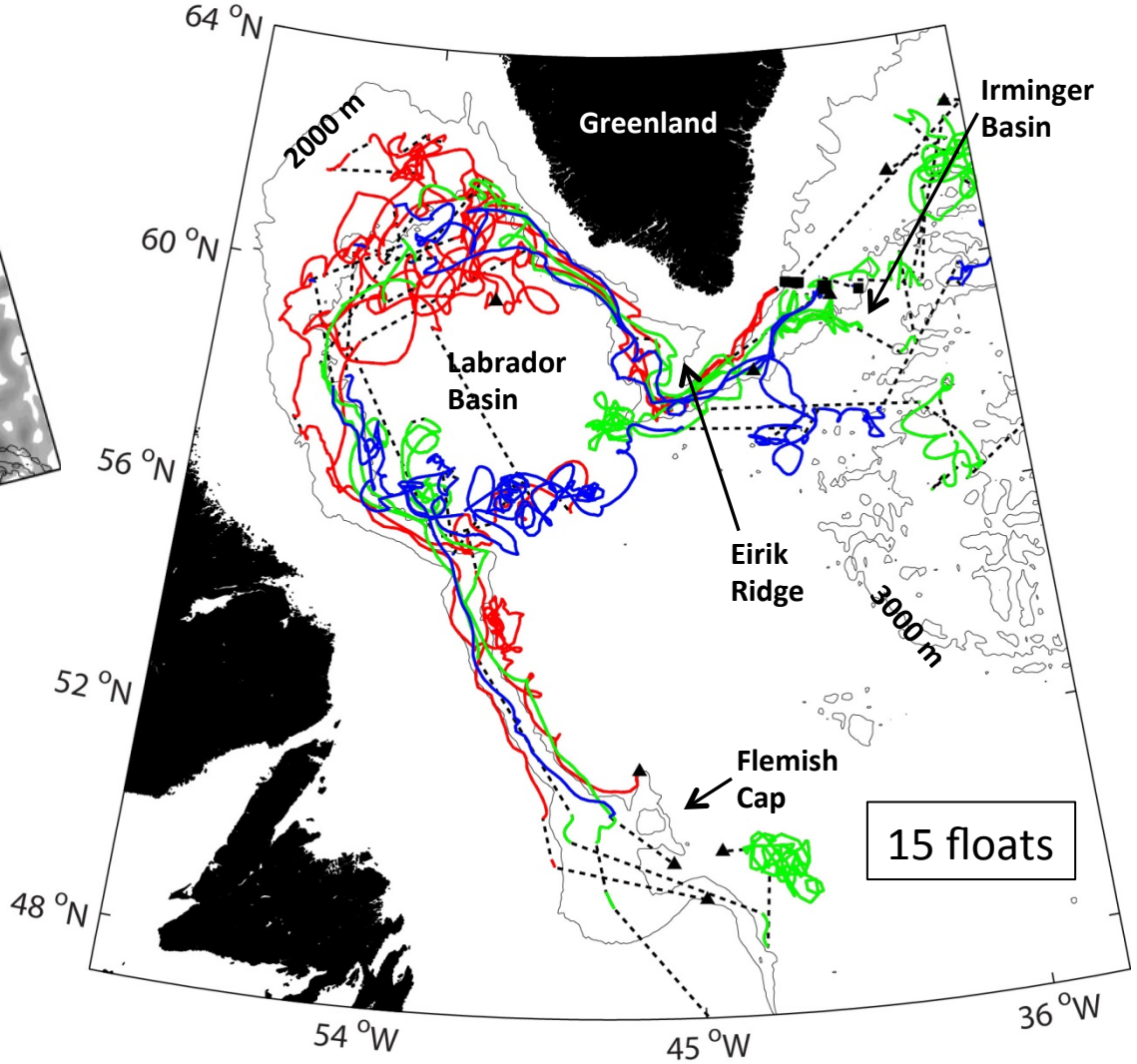


Xu et al. JGR 2010

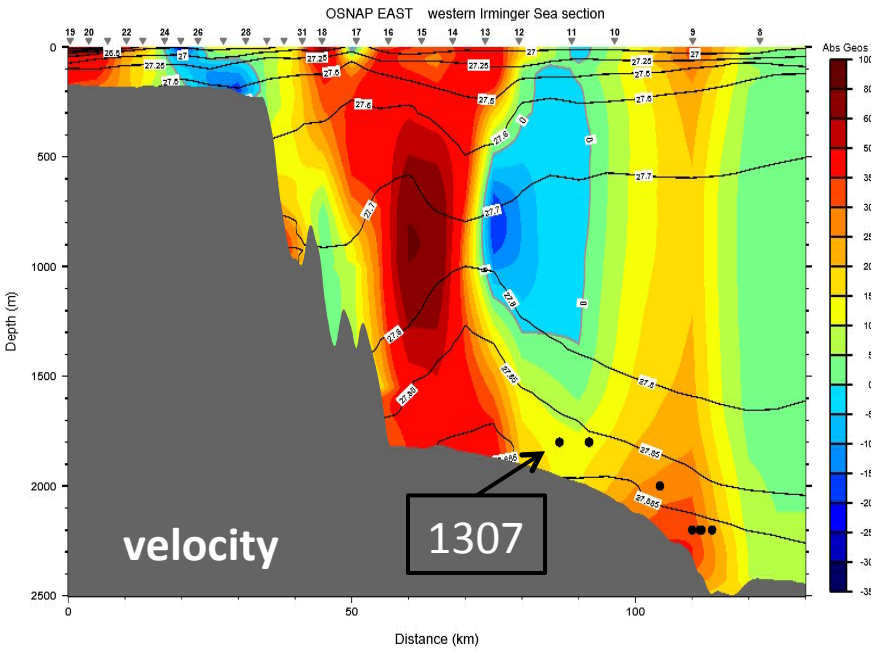
Overflow Water Pathways in Western Subpolar Region

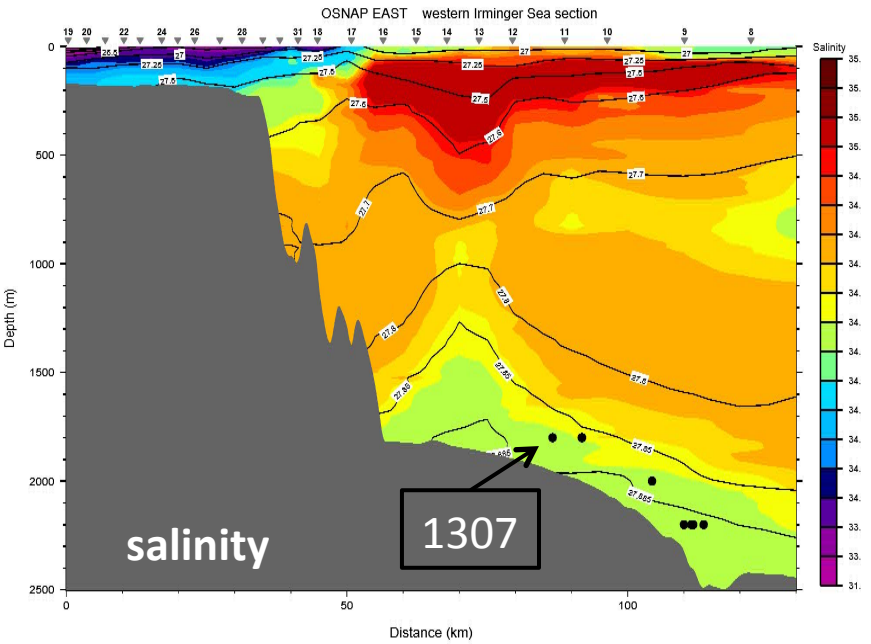


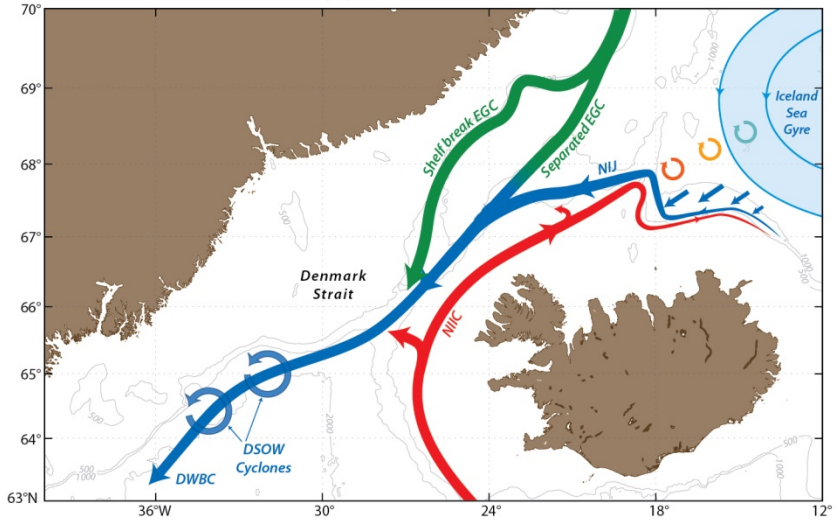
launch
surface
1800 m
2000-2200 m
2500-2800 m
missing data

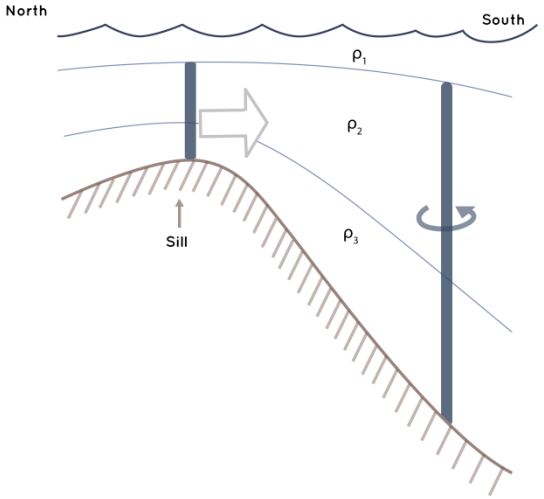


Floats Released in Subsurface Cyclonic Eddy



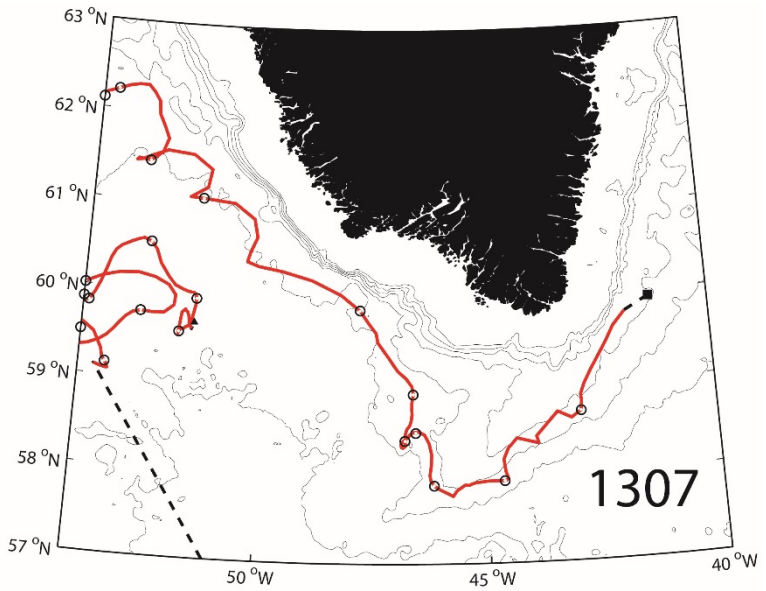


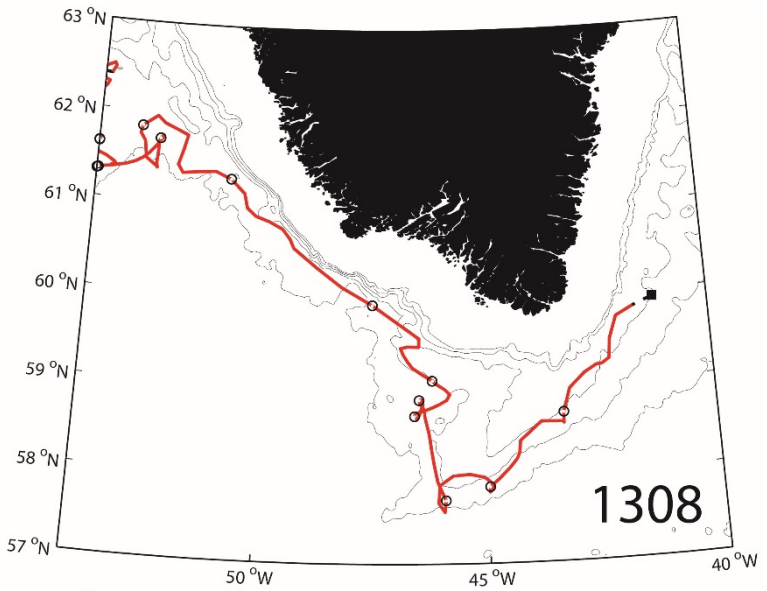


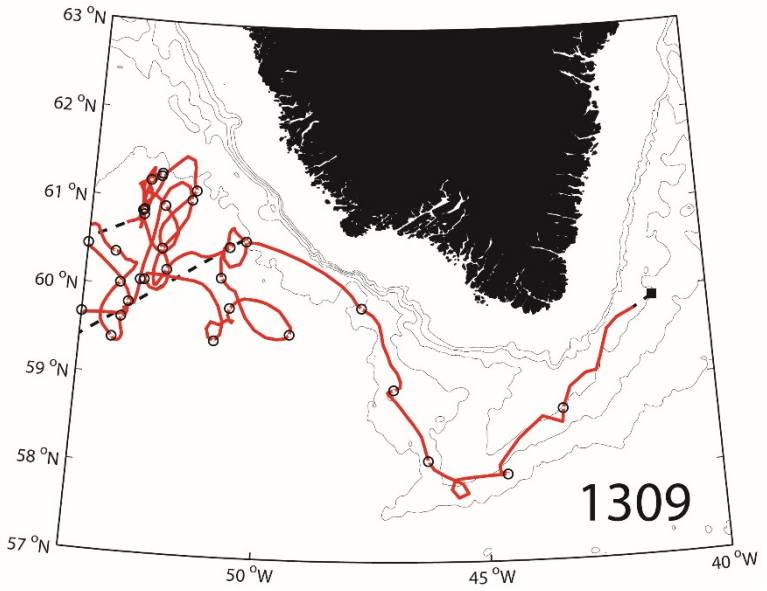


Courtesy of R. Pickart, WHOI

Three 1800-m Floats in Cyclonic Eddy







launch

10-day position

500 m bathymetry contour interval

In summary …

- shallow ISOW flows through northern gaps in Reykjanes Ridge
- ISOW spreads mainly westward and southward from CGFZ, not as much northward into eastern Irminger Basin
- ISOW pathways strongly affected by NAC west of CGFZ-more southward spreading when EKE is higher
- DSOW cyclonic eddies follow the east Greenland slope from 65N to at least the southern tip of Eirik Ridge and possibly into Labrador Basin

Inter-annual Variability in Surface EKE West of CGFZ