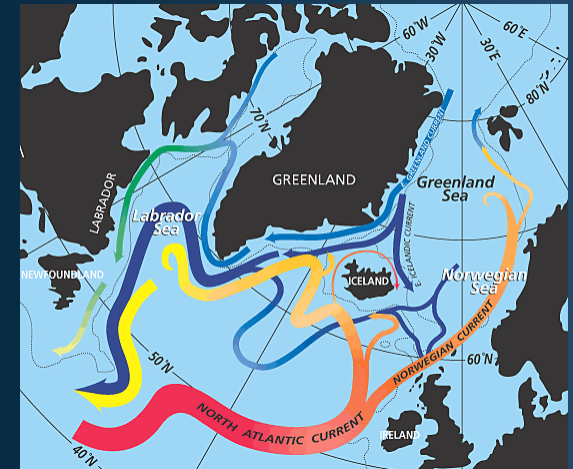


Pathways to Denmark Strait: A Lagrangian study in the Iceland Sea



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Amy S. Bower (WHOI), Heather H. Furey (WHOI)



Denmark Strait Overflow Water

About half the transport of overflow water comes through Denmark Strait.

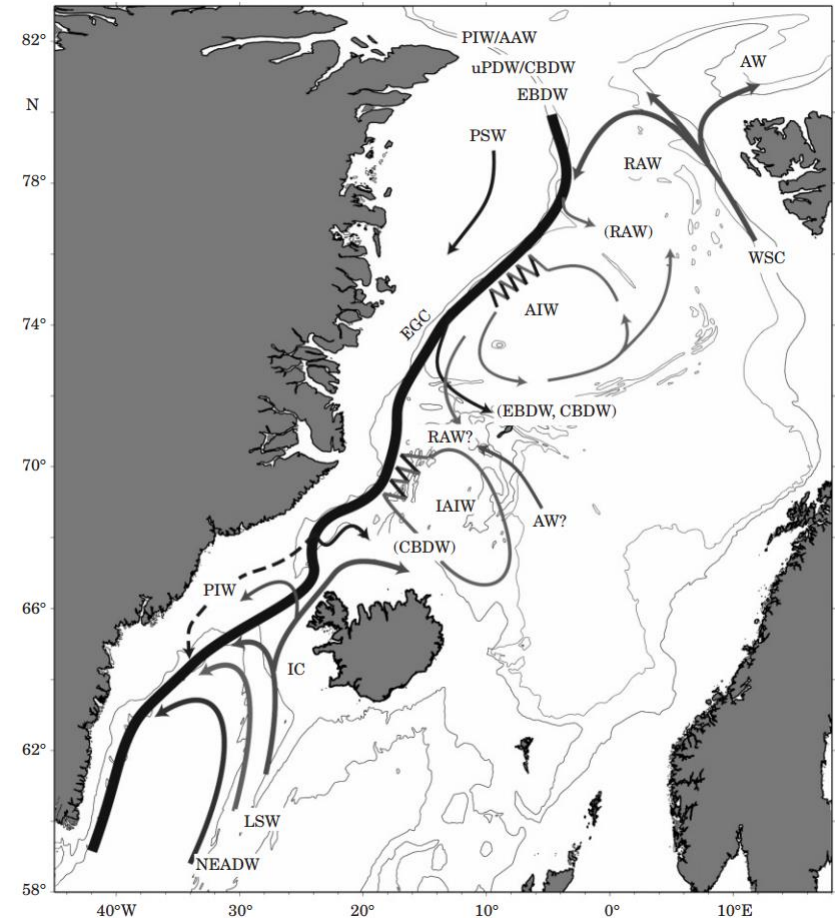
The densest component of North Atlantic Deep Water.

Difficult to model

- Small scale topography
- Strong entrainment

Mainly from East Greenland Current.

- Recirculating Atlantic Water
- Some mixing with Icelandic Arctic Intermediate Water

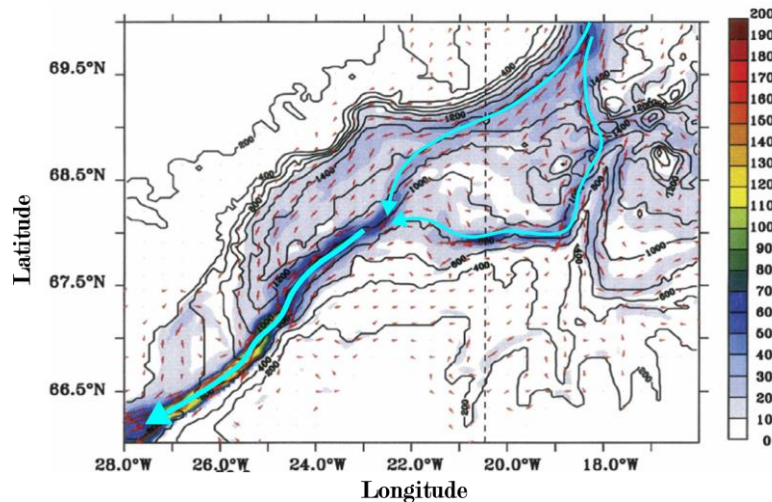


Rudels *et al.*, 2002

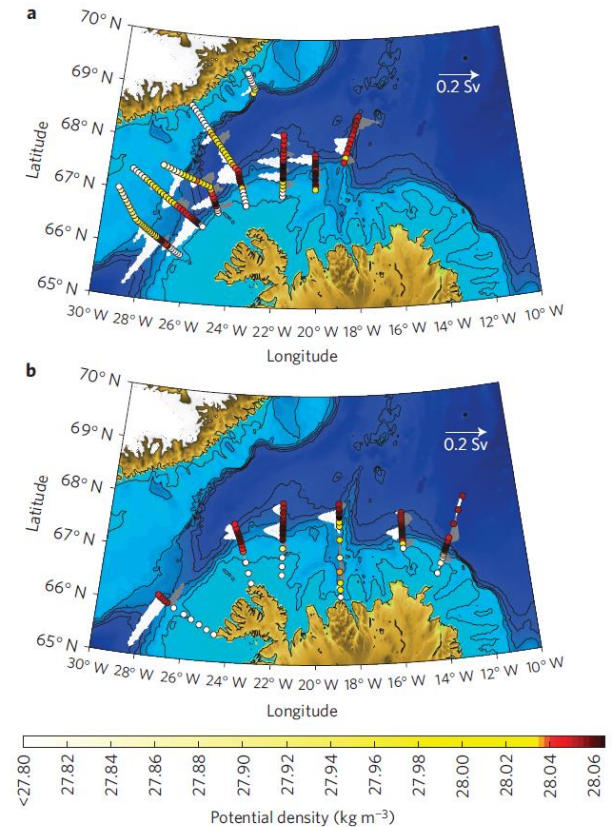
Alternate source?

North Icelandic Jet thought to transport dense water from interior Iceland basin along the northern slope of Iceland.

Joined by a branch of the EGC?



Köhl, 2007

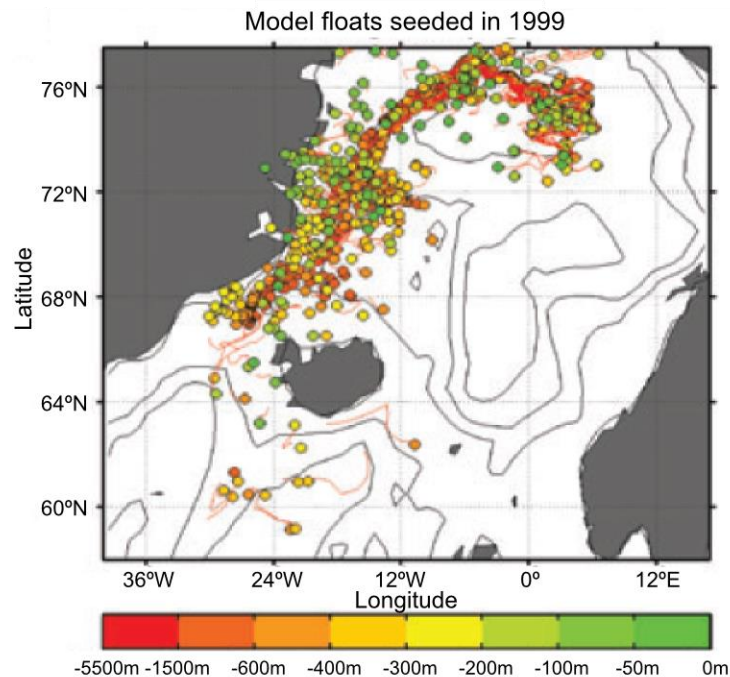


Våge et al., 2011

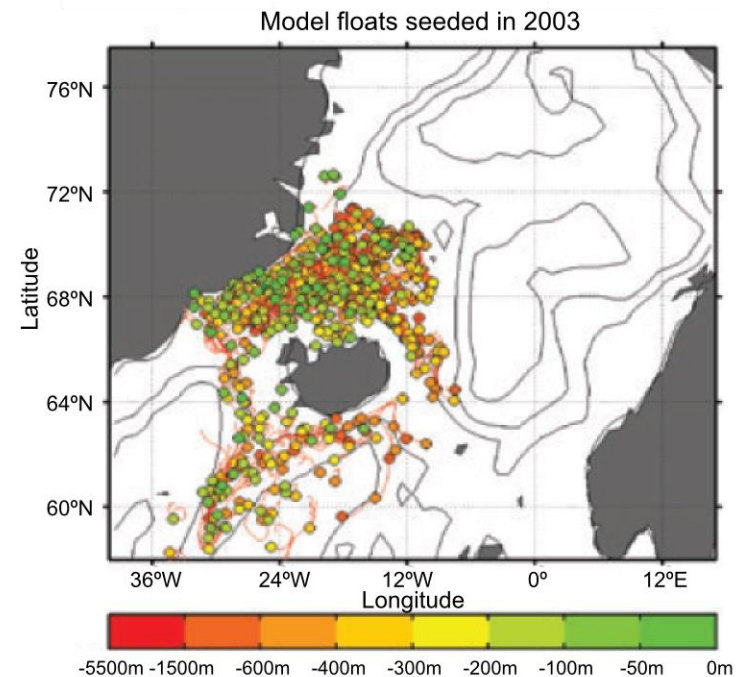
Alternating sources?

Wind forcing may change source from one state to the other.

High τ curl (+NAO)



Low τ curl (-NAO)



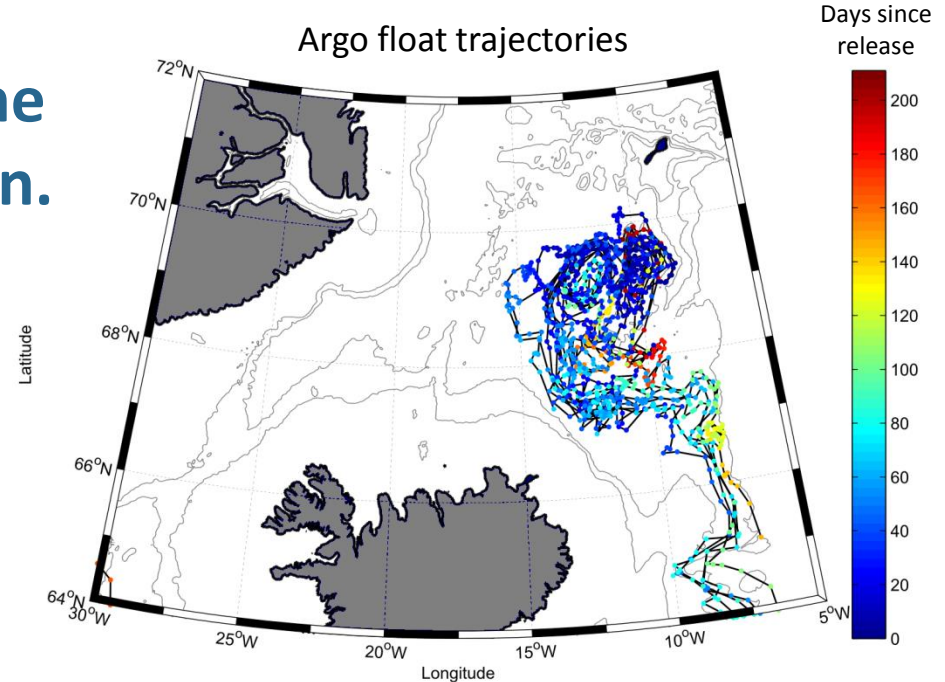
Köhl, 2010

Lagrangian observations

Some observations in Iceland Sea.
Mostly surface drifters & Argo floats.

Argo floats are confined to the
deep (>1500 m) interior basin.

Need observations near the
slopes and at the depth of
the Denmark Strait sill.



Pathways project

Use acoustically tracked RAFOS floats to show the pathways to the Denmark Strait sill.

Collaboration of WHOI and IMR (Bergen, Norway)

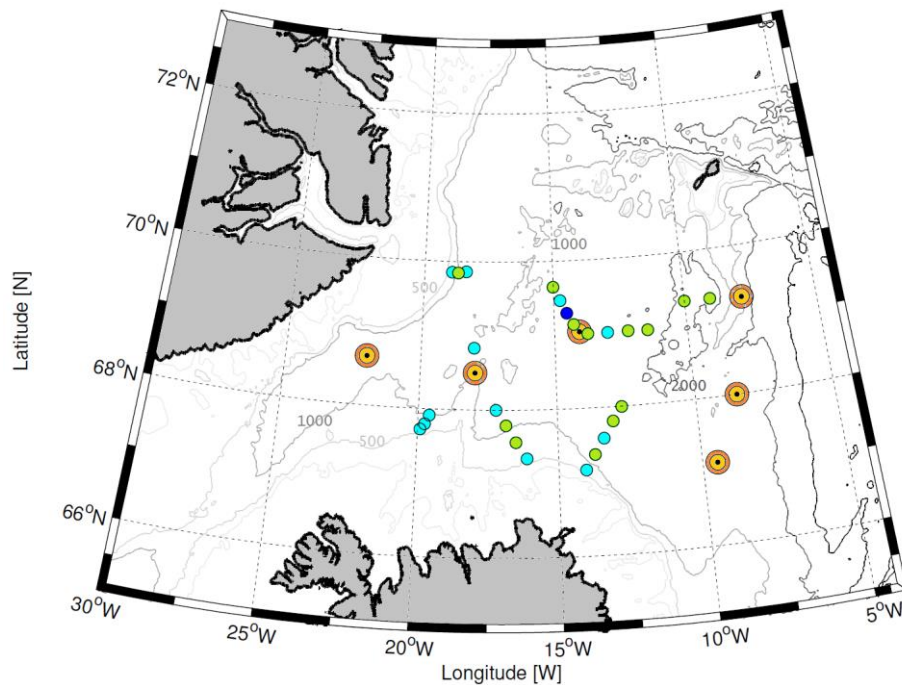
- 52 RAFOS float
- 6 sound sources

Floats will be in dense water ($\sigma > 28 \text{ kg m}^{-3}$) but above the sill depth of Denmark Strait.



RAFOS deployments July 2013

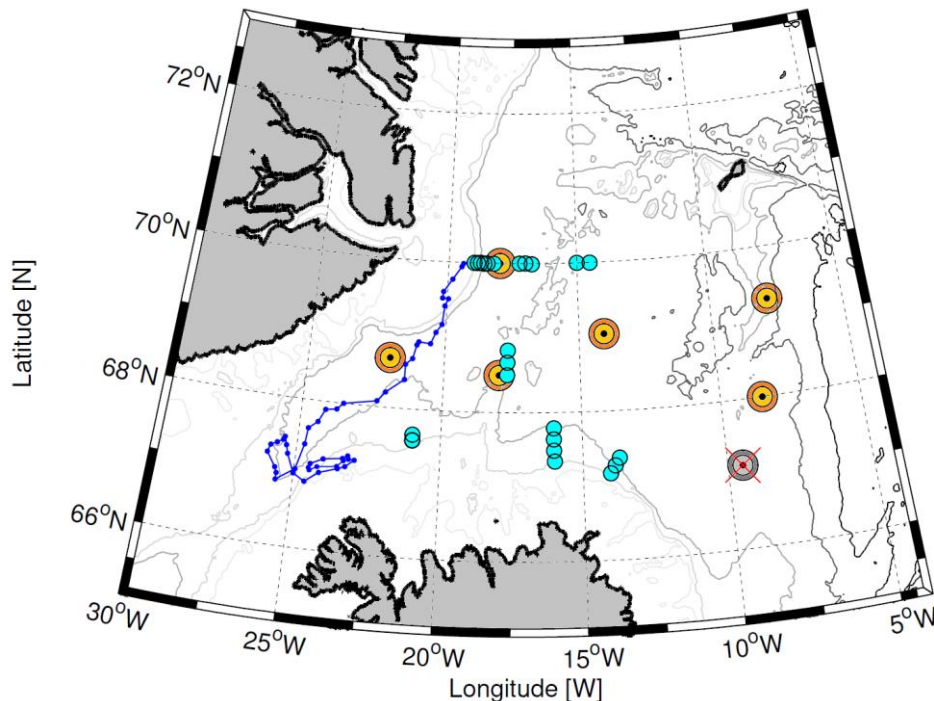
**26 RAFOS, 2 Argo
6 sound sources**



**1 test float surfaced early
10 floats surfaced May 2014
2 lost**



RAFOS deployments July 2014



**26 RAFOS, 1 Argo
1 sound source replaced**

**Floats in interior basing are
likely still there.**

**More focus on western
channel and slopes.**

**One float sank beyond bail
depth and surfaced after two
days.**

To come

All floats up in May 2015

Analyse data from experiment period

- Hydrographic (CTD sections, Argo)
- Forcing (wind, heat flux)

Model collaboration with Armin Köhl (U. Hamburg, Germany)

- Rerun model for experiment period
- Study inter-annual variability

