

Lagrangian sampling of the Norwegian Atlantic Current Surface drifters

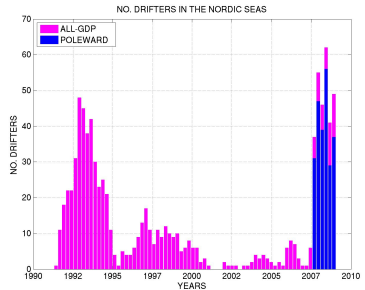
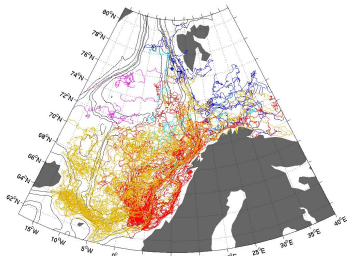
Inga Koszalka, Joe LaCasce
Cecilie Mauritzen, Kjell Arild Orvik

September 1, 2009

Surface drifters (SVP)

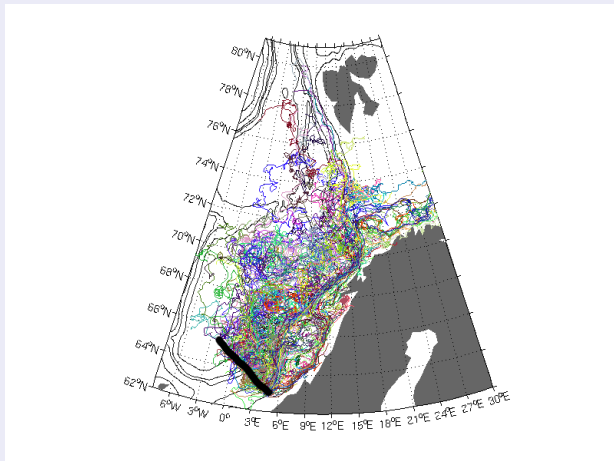
306 surface drifters (15m, SVP)

1990-2009 (Global Drifter Programme + **POLEWARD 118 + 15 + 14**)



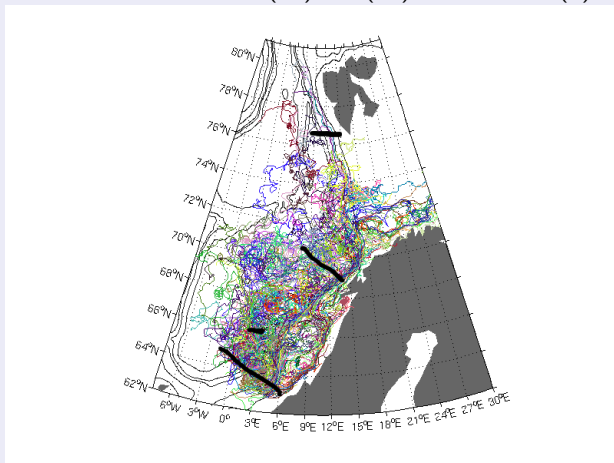
Focusing on the full-scale ocean laboratory in the NwAC

160 drifters (92 deployed + 68 "chance drifters")

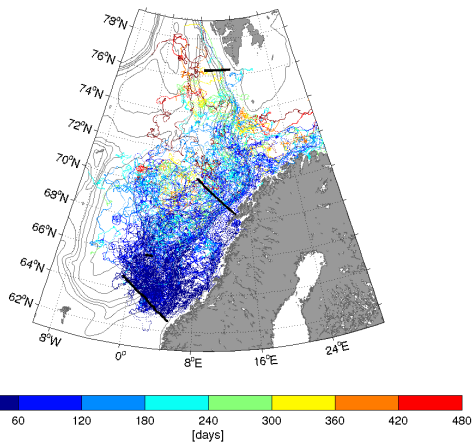


Focusing on the full-scale ocean laboratory in the NwAC

Stations: OWS "M" (58), GI (20), SORKAPP (5)

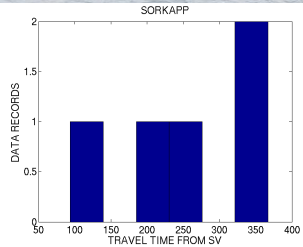
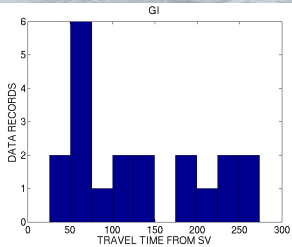
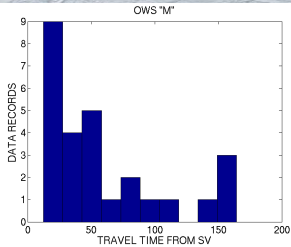


Travel times from SV



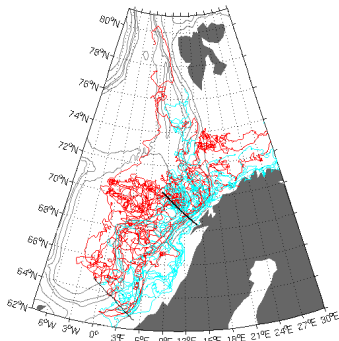
"Fast" channels in the NwAC system. Lofoten Basin - retention area.

Travel times from SV

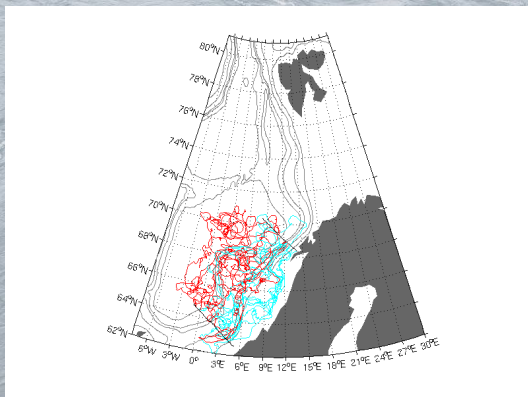


SV drifters at GI: 20

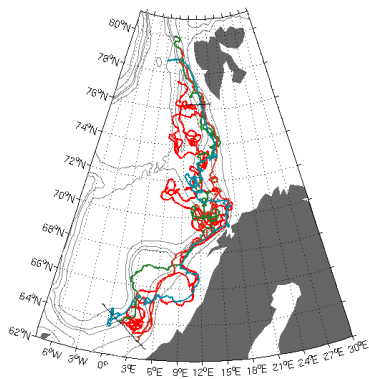
Blue: Fast - WB + EB + NCC (< 150 days at GI) = 13/20
Red: Slow (< 150 days at GI) = 7/20 - Lofoten Basin!



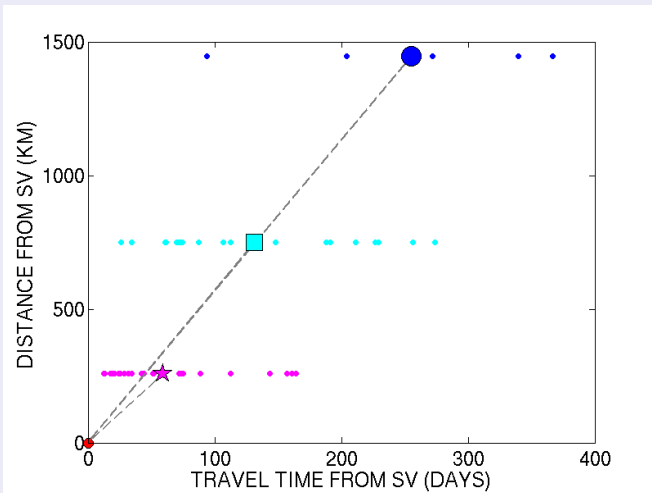
Recirculations



5 Fram Strait explorers

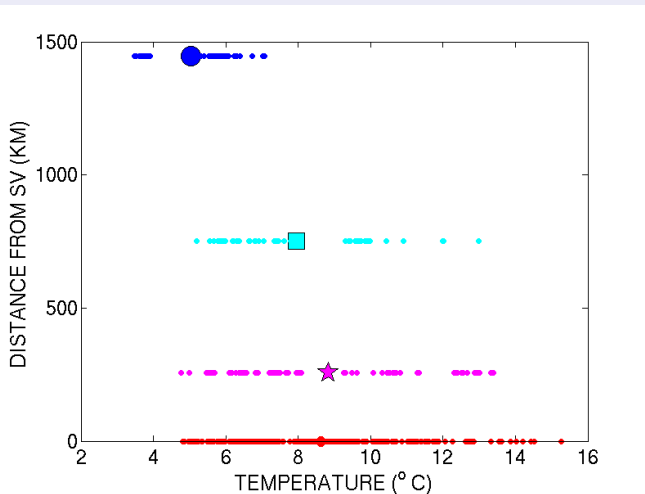


Characteristic travel speed for a water parcel

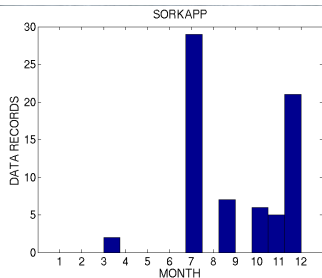
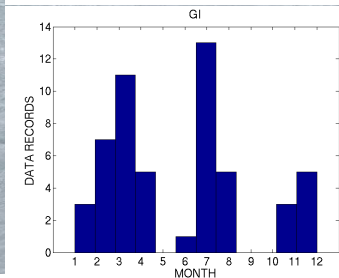
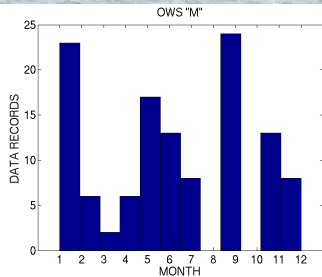
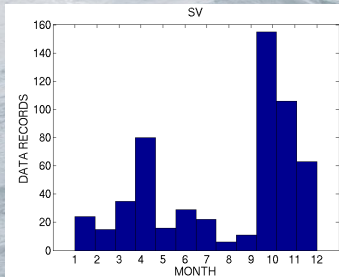


$$u \approx 5-6 \text{ cm/s}$$

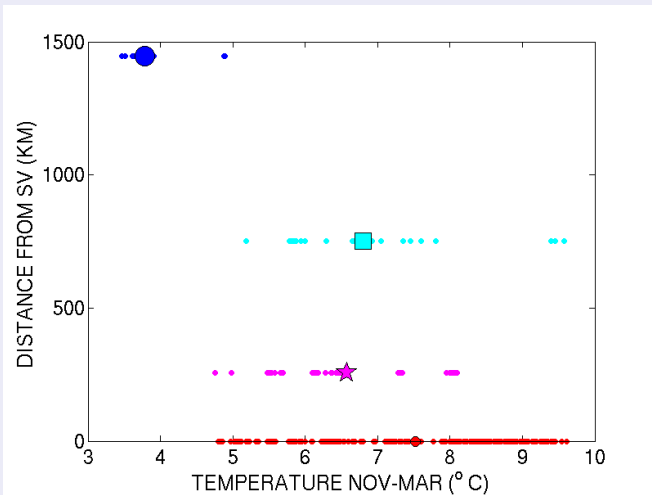
Temperature signal



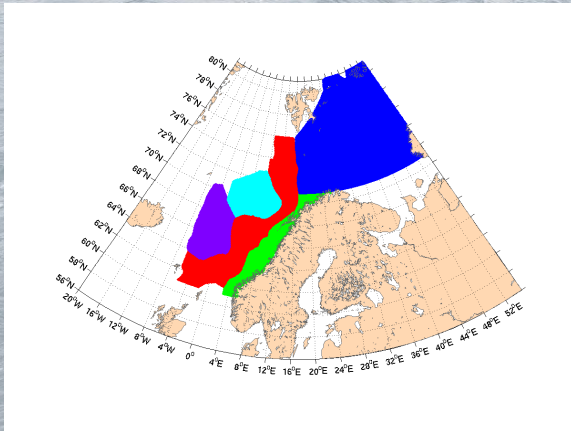
Uneven seasonal sampling



Temperature signal in Oct-Mar

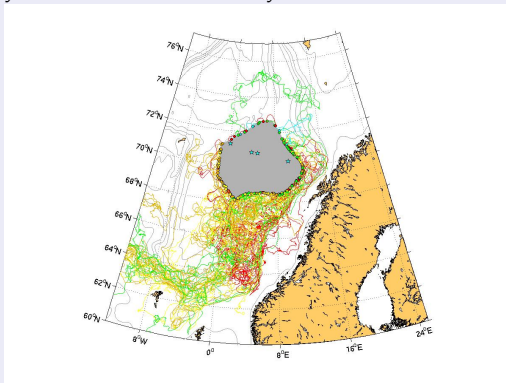


Basin - to - basin exchanges



NwAC/Lofoten exchange

Challenging Rossby et. al. 2009: "...surface drifters in the inner branch appear to behave differently. A few of them break away into the basin ... "



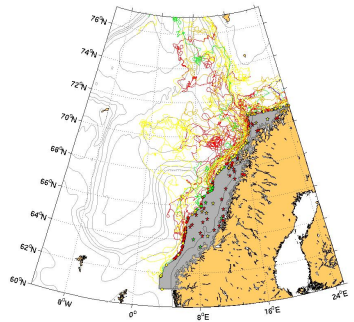
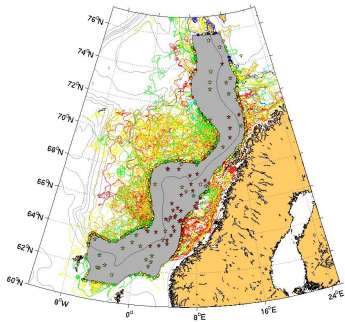
218 drifters in the "slope" region - "veering visits" from east into Lofoten = **153**

From ($< 69N$) $44/153 = 29\%$

From ($69 - 71N$) $61/153 = 40\%$ (NwAC-EB + NCC)

From ($> 71N$) $31/153 = 31\%$

NCC/NwAC



Intense NCC/NwAC-EB exchanges - 234 "visits" (e.g Gascard et. al. 2003)
NCC → Lofoten Basin (!)

Recent deployments: The Barents Sea (15) + The Lofoten Basin (14)



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Thank You!

