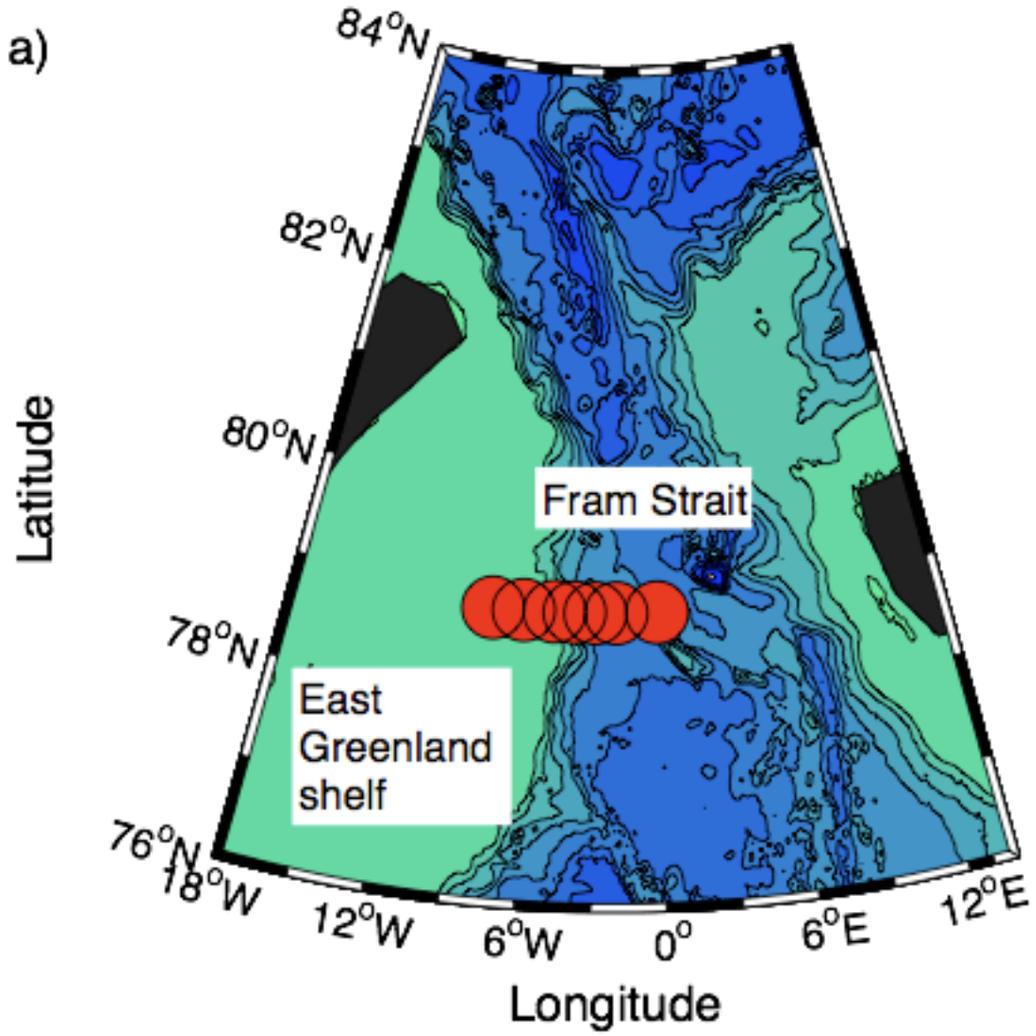
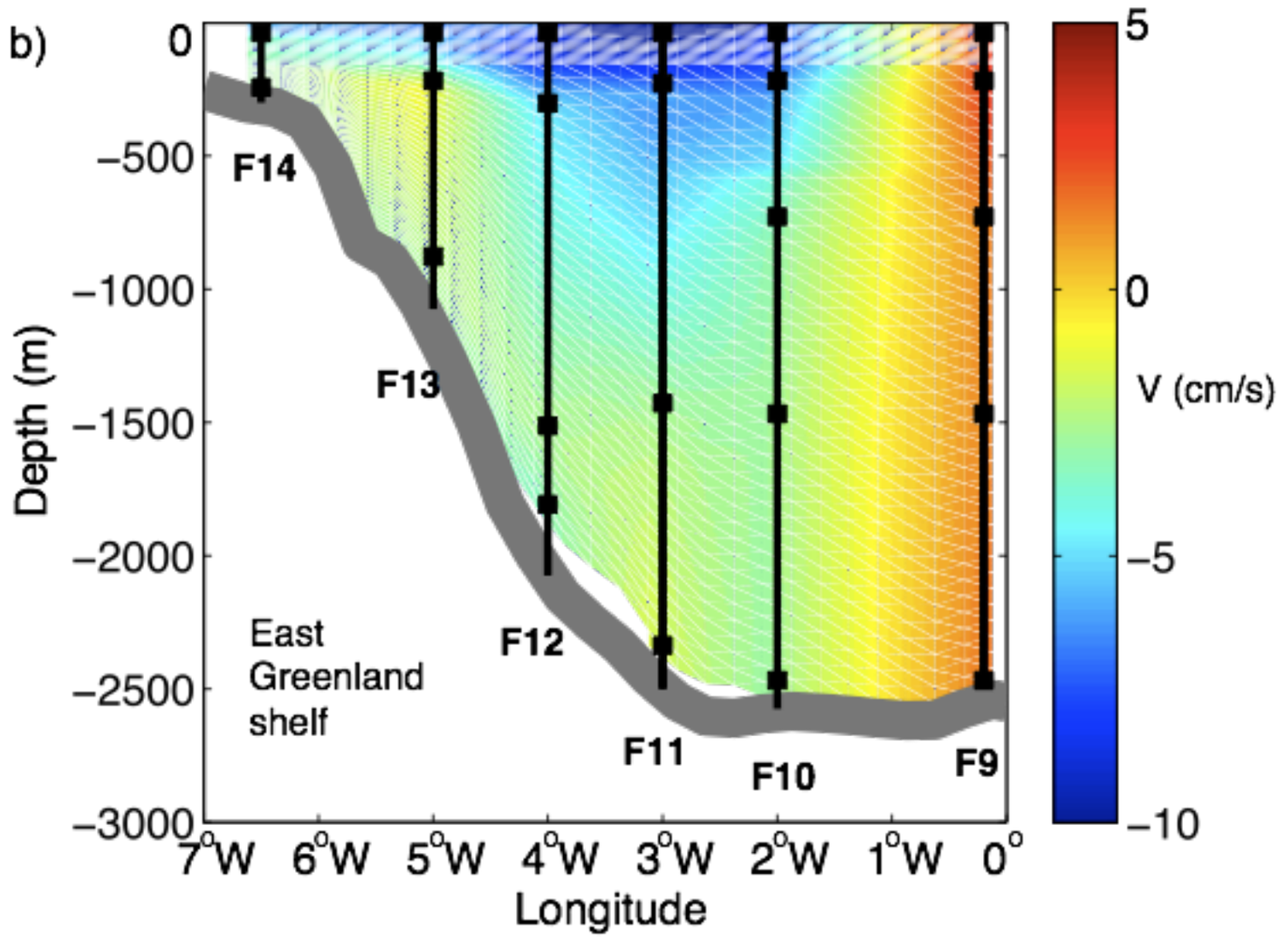
Very brief thoughts on Fram Strait recirculation

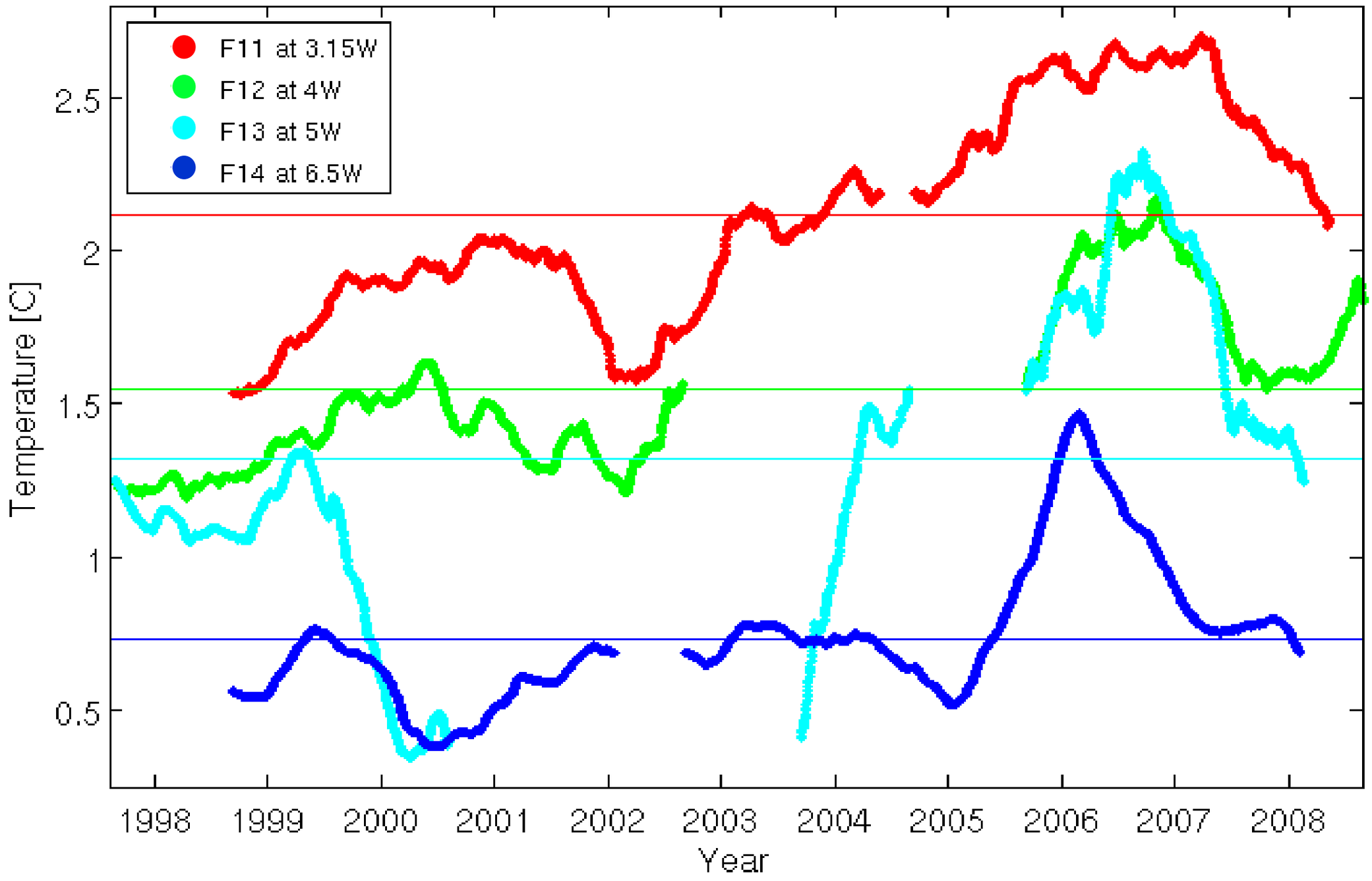
Laura de Steur (NPI)

East Greenland Current at 78°502N

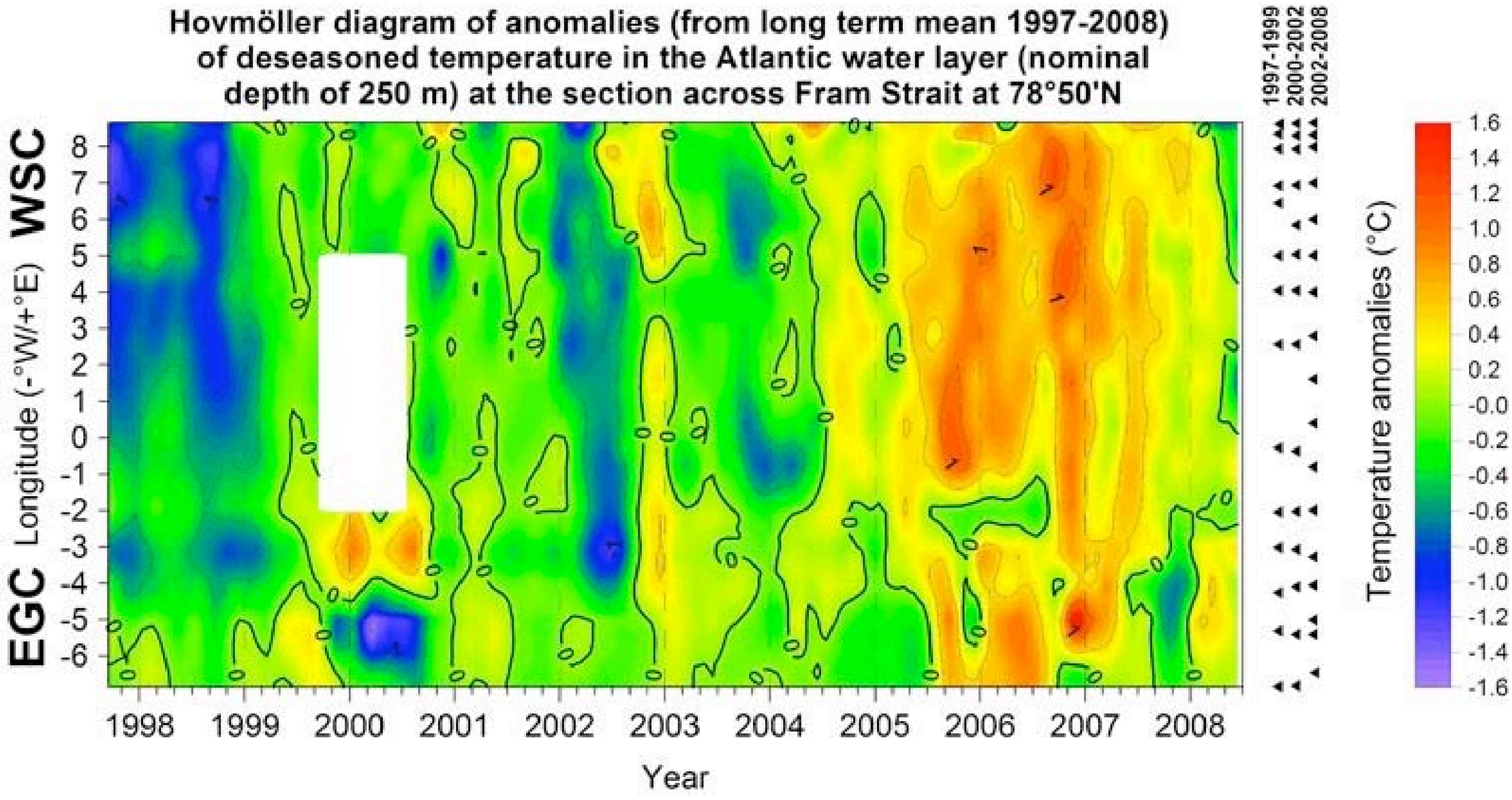




Annual running mean temperature in the Atlantic layer at 250-300 dbar

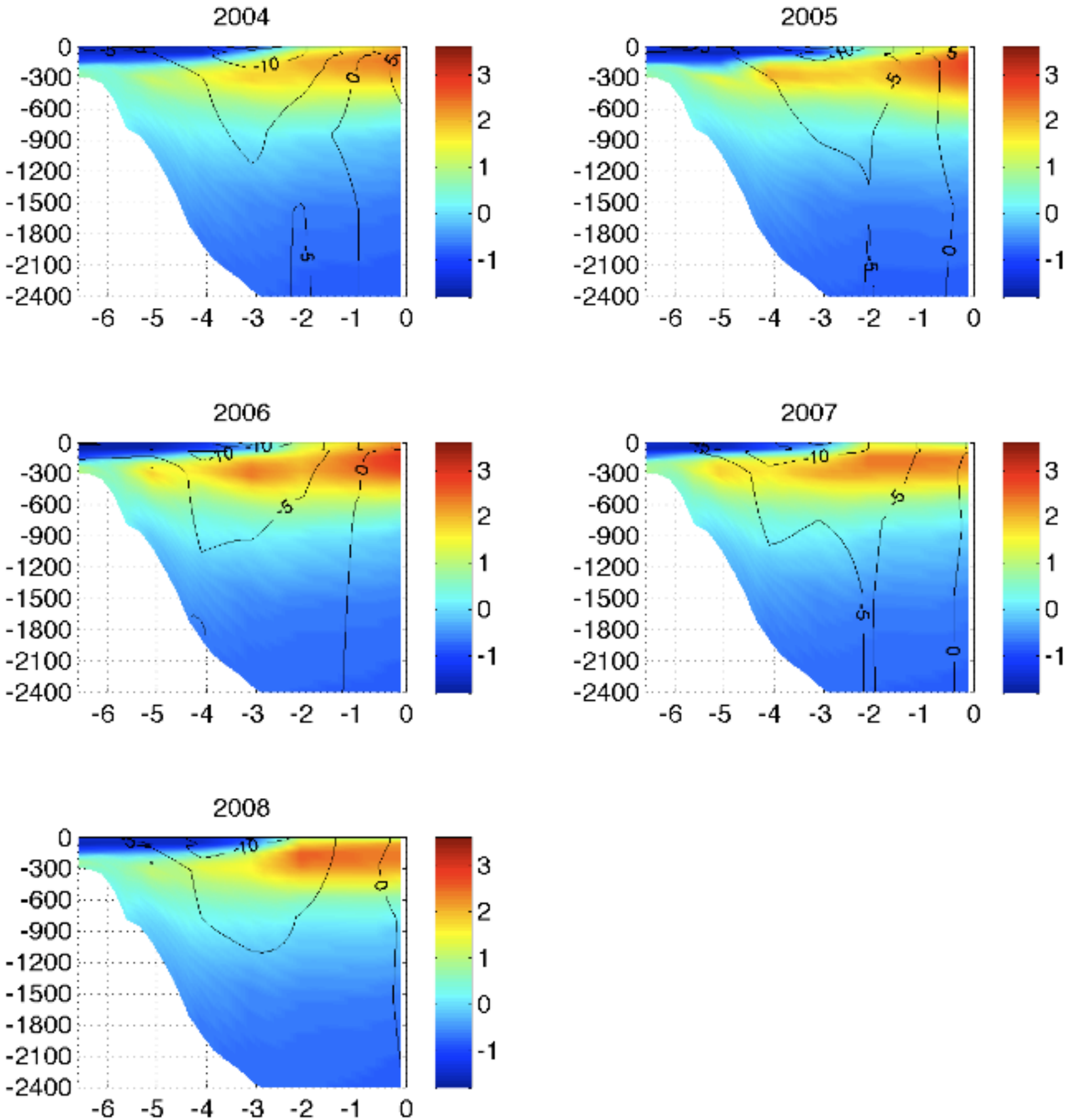


Hovmuller diagram of T anomalies in the Atlantic layer at ~250 dbar

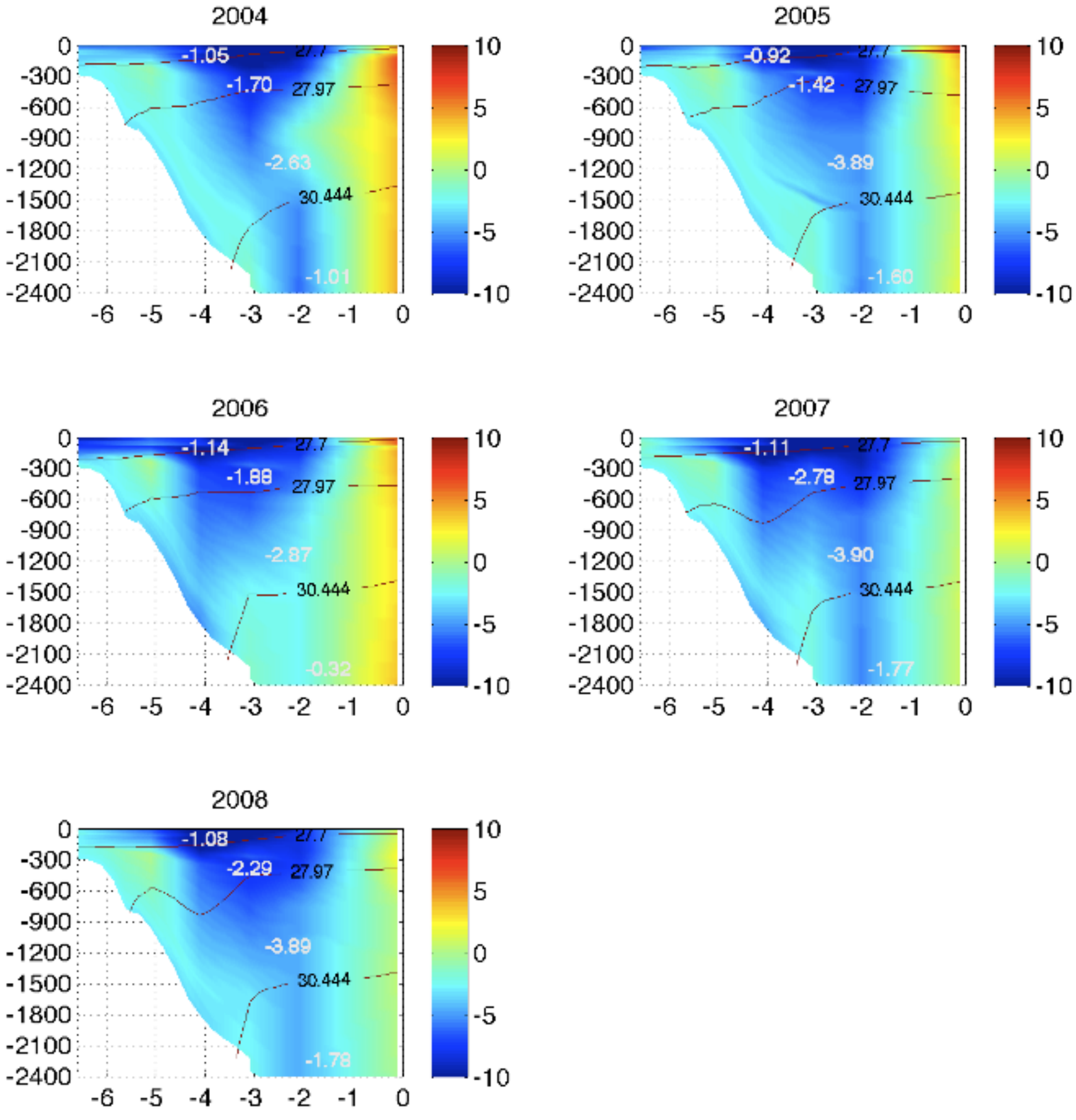


Courtesy: Agnieszka Beszczynska-Möller

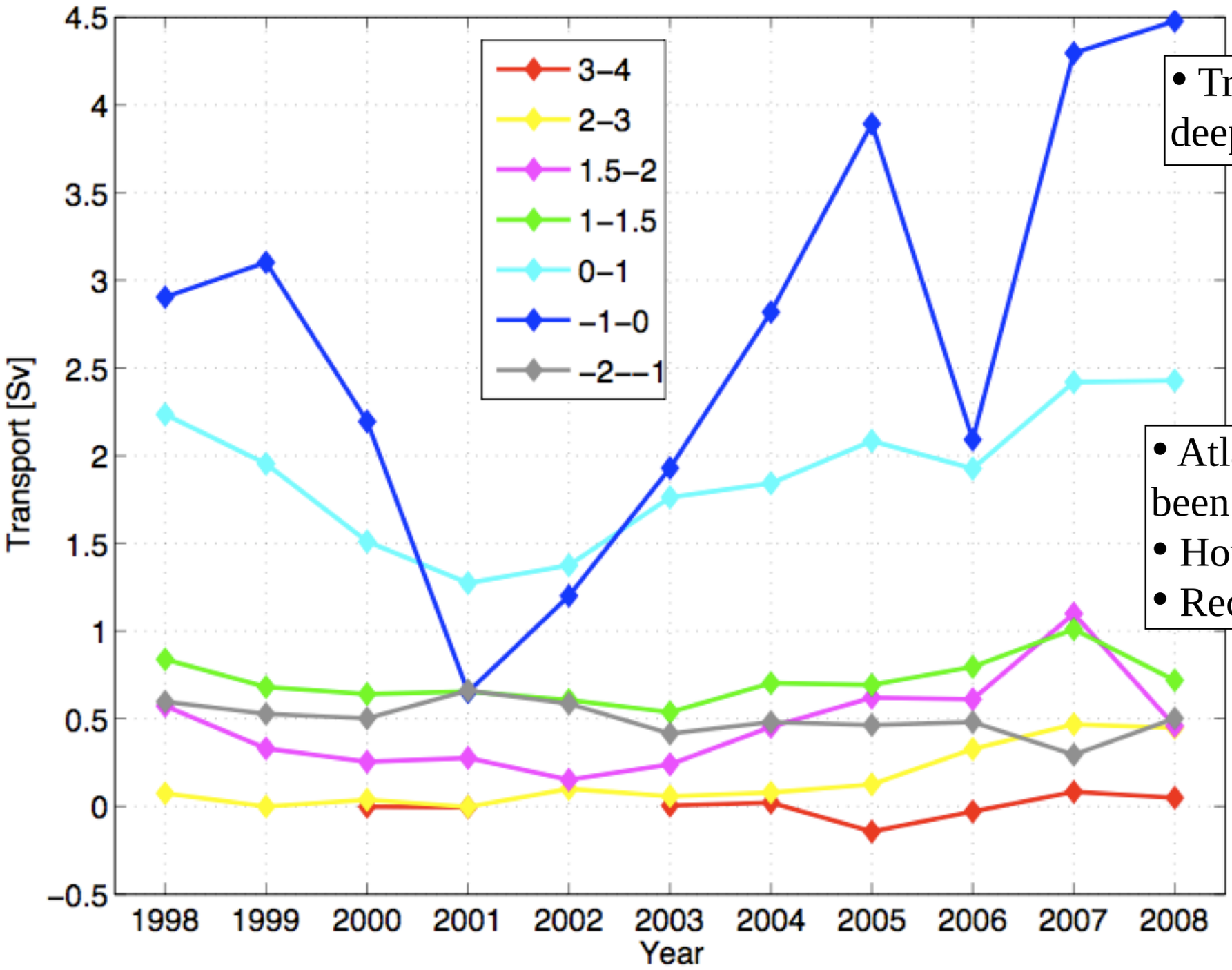
Winter-centered annual mean temperature (color) and velocity (contour)



Winter-centered annual mean velocity field (color), σ_0 or σ_5 (contour), and transports within those σ_0 or σ_5 contours (white text)



Annual mean southward volume transports in different temperature bins



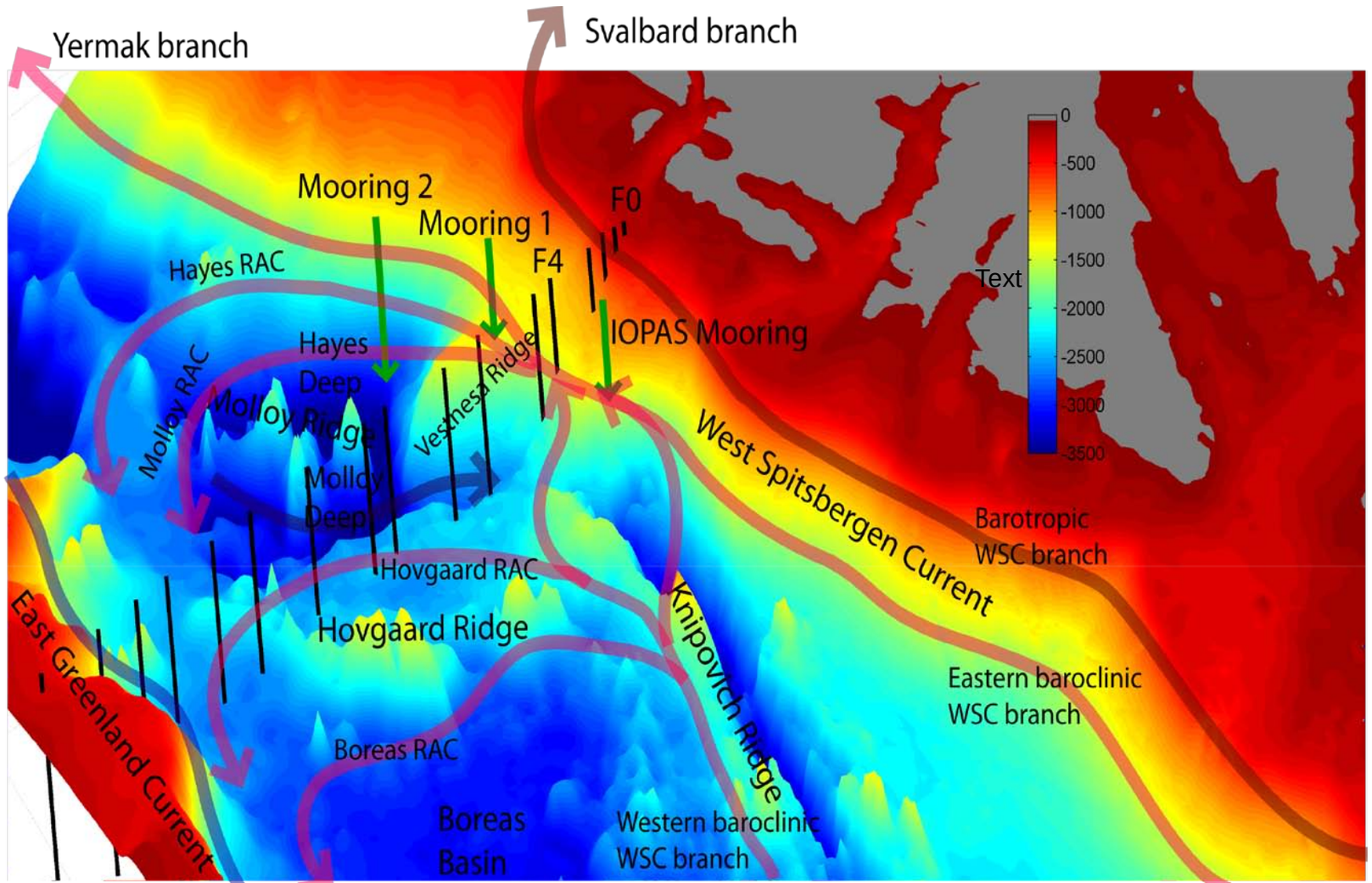
- Transport increase deep layers

- Atlantic water: has it been in the Arctic?
- How much?
- Recirculation?

Proposal: VORHTEX in Fram Strait

Vortex Originated Recirculation & Horizontal Thermohaline Exchanges in Fram Strait

Frank Nilsen, Edmond Hansen, Laura de Steur, Ole Anders Nøst, Vigdis Tverberg,
Ragnheid Skogseth, Sigurd Henrik Teigen



The AW pathways in Fram Strait compiled from previous studies (e.g. Quadfasel et al., 1987; Johannessen et al., 1987; Manley, 1995; Gascard et al., 1995; Walczowski and Piechura, 2007; Schauer et al., 2008) sketched on top of the IBCAO bathymetry. (Courtesy: F. Nilsen, 2009)

- Identify areas and generation mechanisms for unstable vorticity wave modes and their nonlinear evolution
- Recirculation pathways in Fram Strait controlled by topographically steered currents and cross-slope transports through slope current instability processes
- Estimate the mean recirculation and horizontal thermohaline exchanges