Transport of Heat Across the Greenland Continental Shelf by Winds and Eddies in High-Resolution Ocean-Sea Ice Simulations

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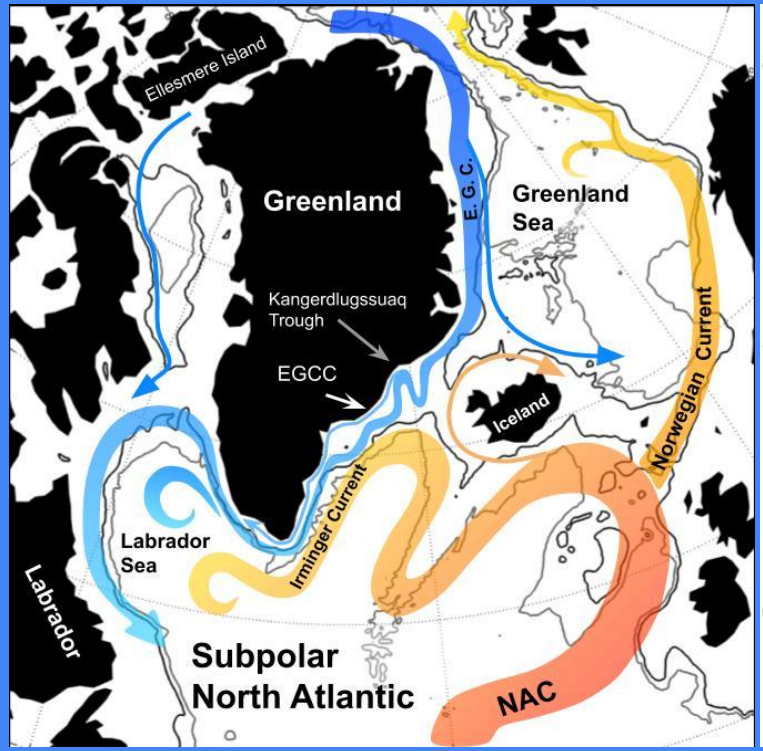
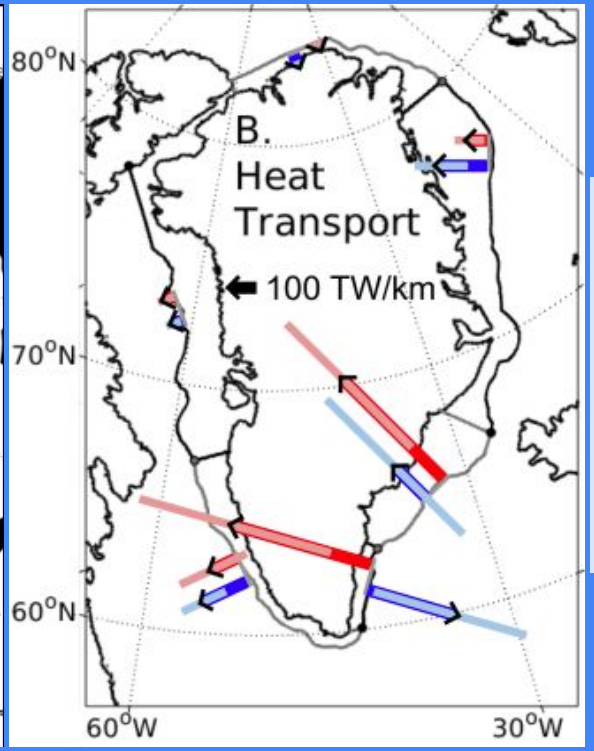
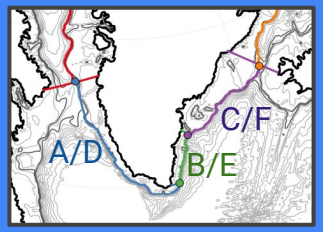
Morrison, T., et al. "Pathways of Oceanic Heat to the Greenland Ice Sheet: The Roles of Wind and Bathymetry on Cross Shelf Heat Transport Mechanisms."





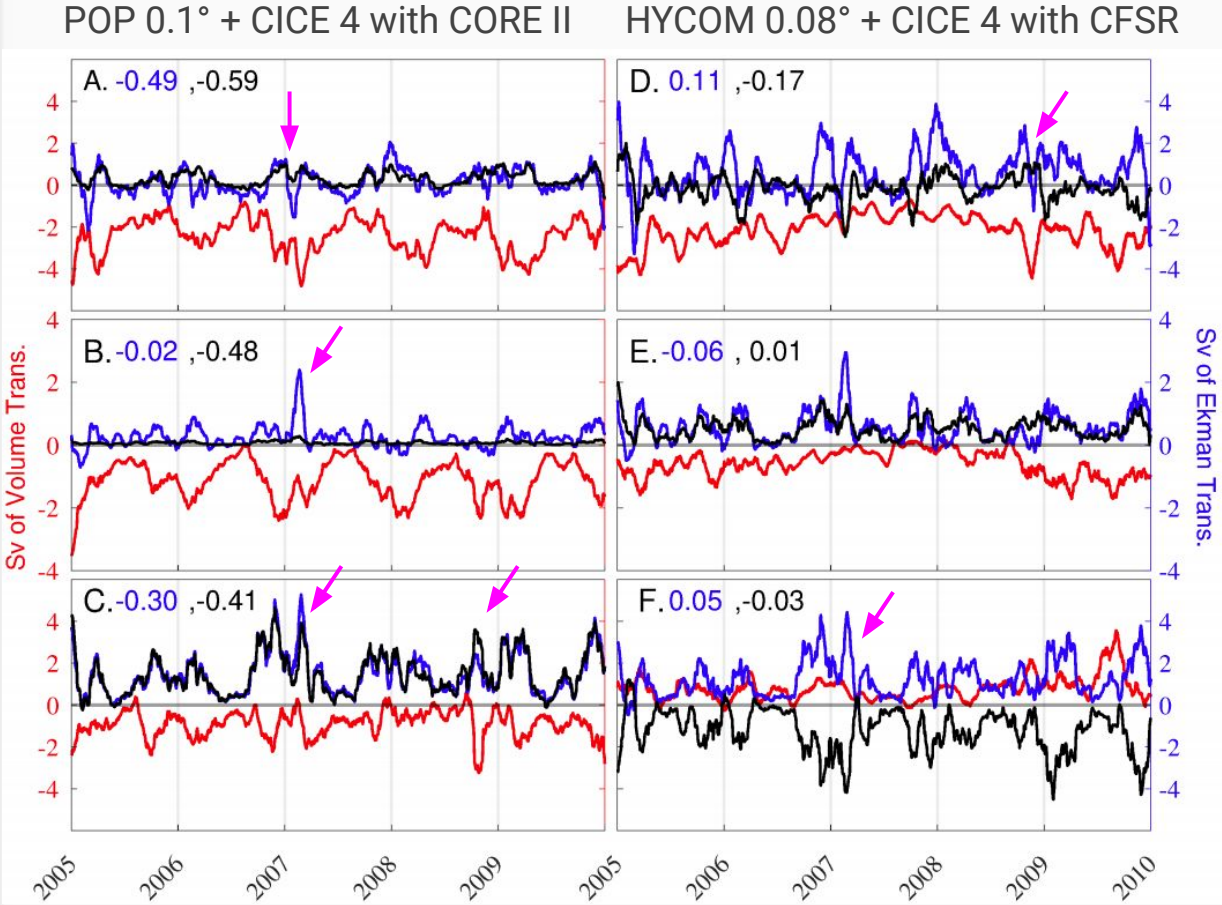
Cross-shelf heat Transport is strongest over the Southeast Continental shelf; 16.4±13.8 TW in POP and 55.0±23.3 TW in HYCOM

Anomalous wind events modify cross isobath volume transport.
Volume transport in POP is correlated to Ekman transport.
In HYCOM interannual variability dominates.



A/D: Southwest Shelf
B/E: Southeast Narrow Shelf
C/F: Southeast Wide Shelf

Red: net volume transport
Blue: Ekman Downwelling
Black: Ekman Pumping



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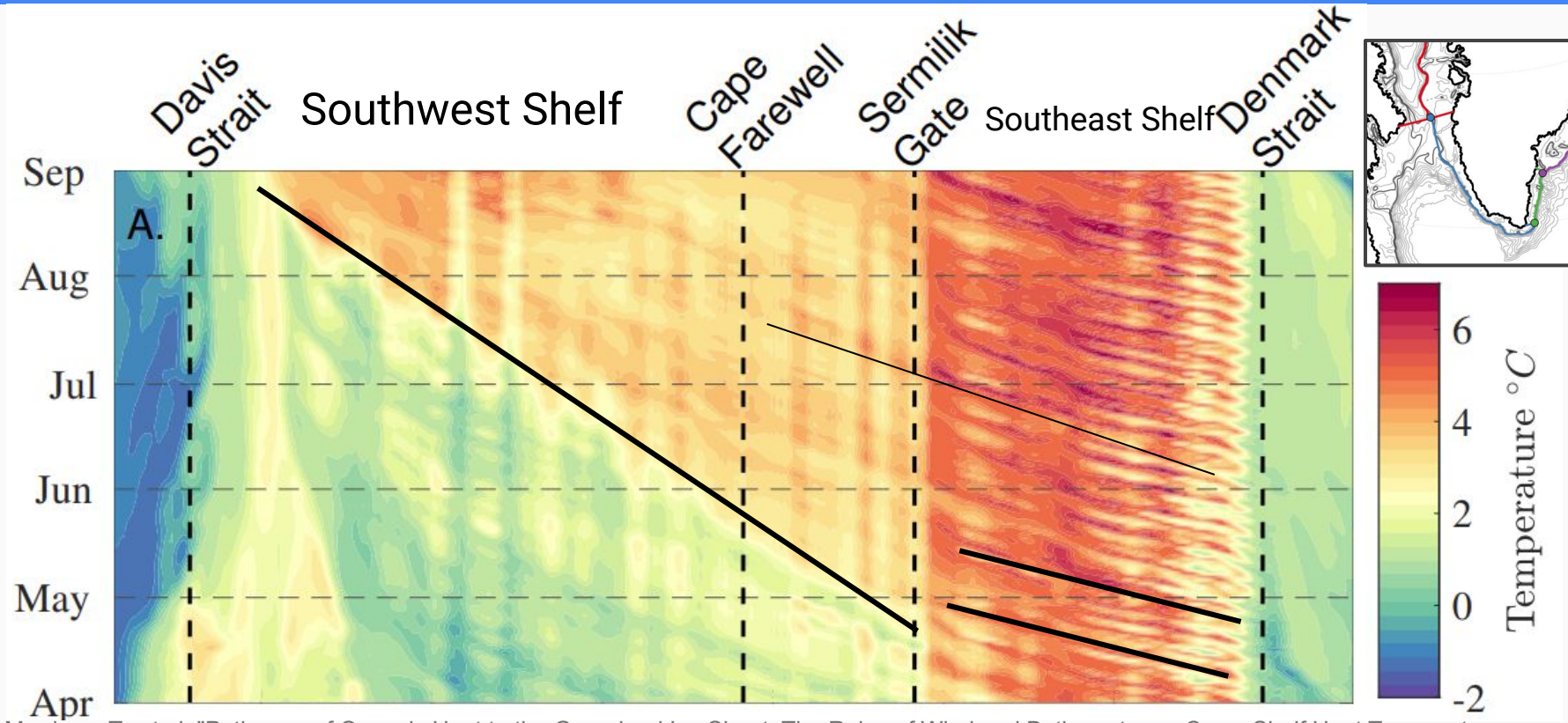
Eddies generated at the Denmark Strait interrupt the transport of warm water across the shelf break but most dissipate as the shelf narrows and steepens.



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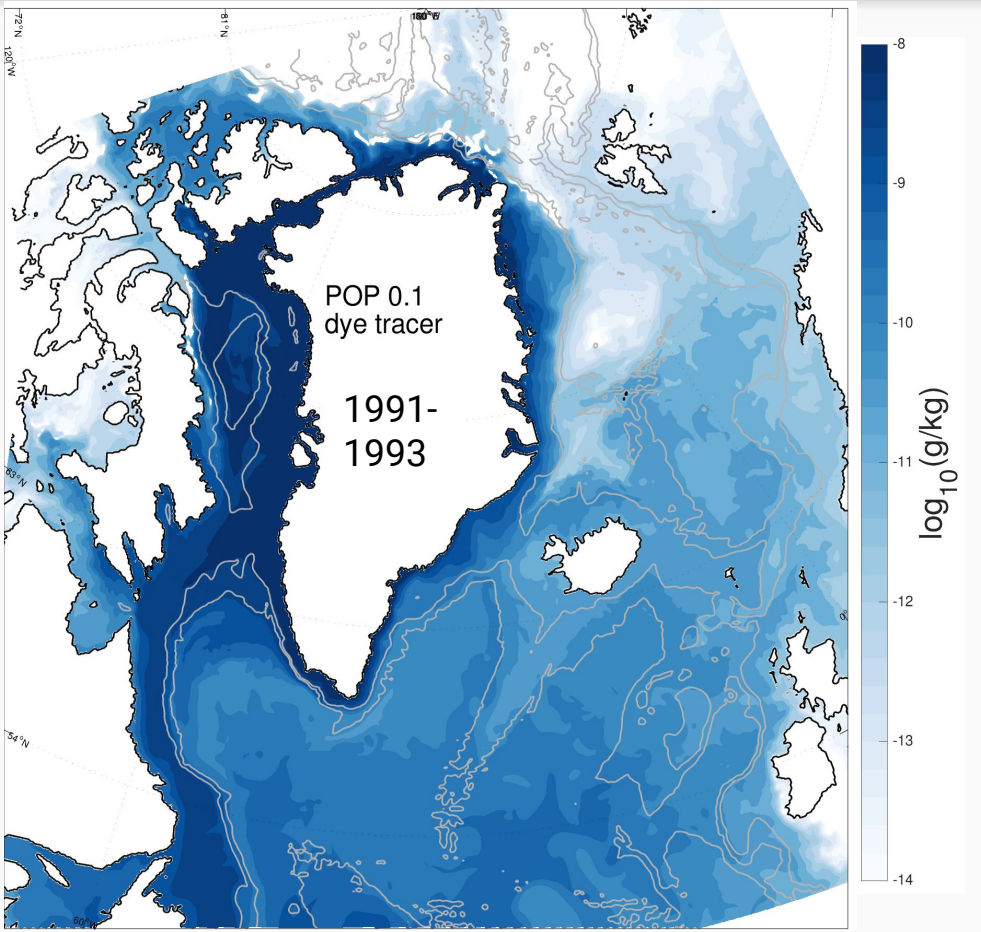
Freshwater Perturbation Experiments: Preliminary Results

Does meltwater from the Greenland Ice Sheet change the mechanisms of cross-isobath heat transport?

- POP2/CICE5 (0.1°) forced with CORE II-IAF
- Bamber et al. 2018 Ice Sheet Freshwater flux
- Meltwater accumulates in Baffin Bay and the Labrador Coastal Current
- Vertically distributing freshwater could change expected impact on the Subpolar North Atlantic



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