

Linking The Atlantic Gyres: Warm, Saline Intrusions From Subtropical Atlantic To The Nordic Seas

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ABSTRACT

Ocean state estimates from SODA assimilation are analyzed to understand how major shifts in the North Atlantic Current path relate to AMOC, and how these shifts are related to large scale ocean circulation and surface forcing. These complement surface-drifter and altimetry data showing the same events. SODA data indicate that the warm water limb of AMOC, reaching to at least 600m depth, expanded in density/salinity space greatly after 1995, and that similar events occurred in the late 1960s and around 1980. While there were large changes in the upper limb, there was no immediate response in the dense return flow, at least not in SODA, however one would expect a delayed response of increasing AMOC due to the positive feedback from increased salt transport. These upper limb changes are wind-driven, involving changes in the eastern subpolar gyre, visible in the subduction of low potential vorticity waters. The subtropical gyre has been weak during the times of the northward intrusions of the highly saline subtropical waters, while the NAO index has been neutral or in a negative phase. The image of subtropical/subpolar gyre exchange through teleconnections within the AMOC overturning cell will be described.