

Trend Reversals in Subpolar North Atlantic Sea Surface Temperature

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Within the past two decades, the upper ocean and sea-surface temperature trends in the subpolar North Atlantic region (SPNA) saw a reversal from warming between 1994-2004 to cooling between 2005-2015, according to data from NASA's global ocean state estimate efforts (ECCO) collected over 1992-2015. Existing research \cite{piecuch} suggests that the trend reversal stems from anomaly in behavior of midlatitude currents - namely the Atlantic Meridional Overturning Current (AMOC) and the subtropical gyre. The relative impacts of the AMOC and the gyre on the heat content of the SPNA is yet disputed. Robson et al, through a comparison of the heat transport of the AMOC and temperature trends in the SPNA find that a decrease in the northward heat transport of the AMOC is the primary cause of the cooling in the SPNA. On the contrary, Piecuch et al attributes the cooling to an increase in the longitudinal heat transport of the gyre. This project will compare the contributions of the two currents through a new theoretical decomposition of ocean velocities. The decomposition hopes to address the extent to which Piecuch's hypothesis is dependent on the diagnostic use and verify its accuracy. Results have implications for the behavior of the AMOC, which plays a key role in the regulation of surface temperature in Western Europe and North America.

