



Decadal Subpolar Gyre variability and relation to heat exchange in the Nordic Seas

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Recent warming of the Arctic and related decrease of sea ice is considered to be partly the effect of anomalous warm advection by the North Atlantic Current system. The University of Victoria Earth System Climate Model with parametrized hydraulics in the Denmark Strait is used to study the effect of localized wind stress variations on the heat transport across the Greenland-Iceland-Scotland Ridge. For a pink noise forcing, the overturning at the boundary between subtropical and subpolar latitudes is red noise with a cut-off between 15 and 20 years. The spectral slope increases in the direction of the equator. To raise the statistical significance of the results, the integration time is several thousand years. Since overturning is not a good indicator for heat transport north of 45°N, the gyre strength is used instead for characterizing decadal variability. The individual heat balance terms for the Nordic Seas are analyzed concerning possible correlations with atmospheric temperature and ice conditions. Results in evolving leads and lags are compared to results from uncoupled ocean models and possible differences are discussed.