Geophysical Research Abstracts,
Vol. 11, EGU2009-5992, 2009
EGU General Assembly 2009

Why are the densest waters of the North Atlantic formed in the Nordic Seas?

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The high latitude North Atlantic's overturning circulation is fed by two distinct transformation pathways. In the Subpolar Gyre, the progressive cooling of the North Atlantic Current waters leads to the formation of an intermediate water mass, Labrador Sea Water. In the Nordic Seas, the Atlantic inflow is modified to produce the dense North Atlantic Deep Waters which result in overflows across the Greenland-Scotland Ridge. In the present climate, the waters formed in the Nordic Seas are much denser than any water mass formed in the Subpolar Gyre, making the Nordic Seas the larger contributor to the Atlanticś overturning circulation. Why is this?
This fundamental question, which challenges our understanding of the process of dense water formation in the worldś oceans, is addressed here using a combination of data and an idealized model which describes the leading order dynamics of the transformation process. The relative contribution of factors such as air-sea fluxes, topography, freshwater, sea-ice and ocean dynamics to the transformation process in the two basins is compared. The fact that the greater transformation occurs within the Nordic Seas is, unlike previous suggestions, primarily a result of the topographic influence of the Greenland-Scotland Ridge on the flow of warm, subtropical waters towards the high-latitudes. The results presented are relevant not only to understanding our present climate but also to past climate scenarios when the location of convection in the North Atlantic was thought to be different.