



The West Greenland Current System of the Labrador Sea from 1992-2008

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The West Greenland Current System transports heat and freshwater into the Labrador Sea, a key component of the Atlantic Overturning Circulation, thus influencing intermediate water formation and its variation. Notwithstanding its importance, relatively little is known about the structure and transport of this current system or its variability. Here we use historical hydrographic data (1992-2008), combined with the AVISO satellite altimetry product, to diagnose the mean property and velocity distributions as well as its seasonal and interannual variability. We find that the surface, fresh West Greenland Current is amplified in the spring, while the warm, salty Irminger Current has maximum transport in the fall – when its waters are also warmer and saltier. These changes in transport are consistent with changes in the baroclinic structure of the current. Interannually, we observe pronounced warm and salty anomalies transiting through the system in 1997 and 2003 - associated with rapid increases in transport due, primarily, to changes in the barotropic component. As we will show, both seasonal and interannual changes influence the lateral transport of heat into the Labrador Sea's interior and - as such - play a role in the modulation of the convection in the Labrador Sea.