



The Greenland Tip Jet and its Effect on the Irminger Sea

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It has been hypothesized that deep, open-ocean convection can occur in the southwest Irminger Sea, driven by an atmospheric phenomenon known as the Greenland Tip Jet. Using a variety of atmospheric and oceanic data sets and an air-parcel trajectory model, we investigate the wintertime conditions in which tip jets occur, their characteristics and the oceanic response. The mixed-layer was observed to reach 400 *m* in the spring of 2003, after a low North Atlantic Oscillation (NAO) index winter. Heat flux timeseries for the mooring site were constructed that include the enhancing influence of the tip jet events. This was used to drive a one-dimensional mixed-layer model, which was able to reproduce the observed mixed-layer deepening. Application of the mixed-layer model to the winter of 1994-1995, during a period characterized by a high NAO index, resulted in convection reaching 1600 *m*. Deep convection in the Irminger Sea would influence our understanding of the ventilation of the North Atlantic and its branch of the meridional overturning circulation.