



## **Numerical Study of Interannual Variability of Circulation and Hydrography over the Northwest Atlantic**

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A regional ocean-ice model based on NEMO was used in examining the main physical processes affecting the interannual variability of circulation, sea ice, and hydrography over the northwest Atlantic Ocean (NWA) during the period 1988–2004. The model is forced by atmospheric reanalysis fields produced by Large and Yeager (2004) and boundary forcing based on the ocean reanalysis data produced by Smith et al. (2010). In comparison with previous observational and numerical results in the literature, the regional ocean-ice model has reasonable skill in simulating the large-scale circulation, sea ice, and associated seasonal and interannual variability over the study region. Analyses of model results demonstrate that the interannual variability of circulation over the Labrador and northern Newfoundland shelves is significantly affected by the variability at high latitudes which propagates onto these shelves through the northern open boundary. Over the eastern Newfoundland Shelf, the interannual variability is significantly affected partially by the non-linear interaction between the Labrador Current and the North Atlantic Current and partially by the variability propagating from the southern Labrador Shelf. The interannual variability over the Slope Water region off the Scotian Shelf is significantly affected by anomalies advected by the Gulf Stream and by the non-linear dynamics taking place in the deep waters to the south of the Tail of the Grand Banks.