



Exchanges of volume, heat and freshwater through the Canadian Arctic Archipelago: a numerical study.

Nathan Grivault, Xianmin Hu, and Paul G. Myers

Eath and Atmospheric Sciences, University of Alberta, Edmonton, AB, Canada

The Canadian Arctic Archipelago (CAA) is a tangle of shallow basins interlinked by narrow straits. It is the main pathway of liquid freshwater from the Arctic Ocean to North Atlantic. It also receives runoff from the Mackenzie River and the glaciers of the different islands that composes the archipelago. This study is based on a set of numerical experiments using a regional configuration of the coupled ocean/sea-ice general circulation model NEMO. We consider a long-term hindcast (1958-2014) as well as the more recent period (2002-2014) using high resolution inter-annual forcing from Environment Canada. We used an improved mapping of runoff to ensure correct amounts of freshwater are added to the system. We evaluate the flow pathways through the CAA, as well as the transport of volume, heat and freshwater. Results are evaluated against observational sections. We also look at the variability and the dynamics driving it. Passive tracers are used to complement the analysis.