## Sub-mesoscale modelling of the Labrador Sea

The Labrador Sea is a very dynamic region, with physical processes occurring at a variety of scales, from large scale gyre circulation to small scale convection processes. These small scale features are difficult to represent with numerical simulations due to high computational costs. We carry out a NEMO simulation incorporating two AGRIF nests to achieve 1/60° horizontal resolution (about 900m) in the Labrador Sea. This computationally expensive simulation has been run over 2002-2018. We will showcase some results, primarily focused on the greatly improved spatial extent of convection, subduction of Labrador Sea Water, structure of the boundary current on the Labrador and West Greenland Shelves (including representation of inshore coastal currents) and resolved eddies including Irminger Rings. We will examine the processes associated with eddy formation and how that is related to stratification changes. We will then examine how the enhanced resolution modifies the exchange of heat and freshwater from the boundary current systems into the basin interior, as well as impacting the pathway of the North Atlantic Current downstream in the intermediate resolution nest.

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