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High resolution sea ice-ocean modeling of the Canadian Arctic Archipelago in a global setup: An unstructured mesh modeling approach

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The freshwater (liquid and sea ice) outflow from the Arctic Ocean into the North Atlantic through the Canadian Arctic Archipelago (CAA) is an important component of the Arctic freshwater cycle. The freshwater export into the North Atlantic is of great importance for the deep water formation, which is crucial for the Meridional Overturning Circulation. As the CAA is characterized by complex coastlines and narrow straits, properly resolving this region in a global configuration is very difficult with traditional ocean models.
In this work we exploit the Finite Element Sea-ice Ocean Model (FESOM) to study the sea ice and ocean conditions in the CAA region and the freshwater transport variability through its straits. A global model setup with a special focus on the CAA area is used. The global configuration obviates the need for boundary conditions and traditional nesting, while the local refinement up to a mesh size of 2.5 km in the CAA region allows a realistic representation of the narrow straits.
Some preliminary results will be presented, including comparison with observational data as a model validation (e.g. transport through Barrow Strait on a 8 years time scale). Total volume and freshwater transport will be analyzed on inter-annual scales.