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# Modeling ocean and sea ice dynamics of the Canadian Arctic Archipelago: Aspects of forcing

Claudia Wekerle (1), Qiang Wang (1), Sergey Danilov (1), Paul G. Myers (2), Thomas Jung (1), and Jens Schröter (1)

(1) Alfred Wegener Institute for Polar & Marine Research, Bremerhaven, Germany (claudia.wekerle@awi.de), (2) Department of Earth and Atmospheric Sciences, University of Alberta, Edmonton, Alberta, Canada

The Canadian Arctic Archipelago (CAA) is one of the main pathways for freshwater exiting the Arctic Ocean. Freshwater exported to the North Atlantic may influence the deep water formation in the Labrador Sea, and thus the meridional overturning circulation.
Modeling ocean and sea ice conditions of the CAA is difficult because of narrow straits and complex coastlines. The Finite-Element Sea-ice Ocean circulation Model (FESOM) configured on a global mesh is applied to assess the volume, freshwater and sea ice transports through the CAA. With a mesh resolution of 5 km in the CAA we are able to accurately resolve complex coastlines. Outside the CAA the mesh is refined to 24 km north of 55°N with a global background resolution of 1.5°.
In this study, first, it is shown that the transports modeled with FESOM correlate well with the available observational data. Second, the model is used to learn about the impact of different atmospheric forcing datasets differing in spatial and temporal resolution (CORE 2 and the Reforecast dataset from Environment Canada). The CORE 2 dataset is on the T62 grid, which is coarse compared to the Reforecast dataset with grid resolution of 0.45° longitude and 0.3° latitude. The temporal resolution of the Reforecast dataset is higher than the CORE 2 dataset (one hourly and 6-hourly data, respectively, for wind, surface temperature and specific humidity fields). The representation of sea ice in the CAA can be improved by using the high resolution atmospheric forcing.