

## **Ocean Variability around Greenland: Insights from Observations and a High Resolution Coupled Ocean-Sea Ice Model**

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Ocean variability around Greenland occurs on a wide range of temporal and spatial scales, from decadal basin-scale fluctuations of ocean heat and salt in the subpolar gyre to eddy-scale mixing of warm, salty subtropical-origin waters onto the continental shelf, to sub-daily tidally-driven exchanges within its numerous glacial fjords. Here, we describe our understanding of ocean variability around Greenland on basin and eddy scales inferred from satellite and in situ observations and numerical ocean models. Emphasis is given to the decadal-scale changes associated with subpolar gyre variability and the sub-annual variability on the continental shelf due to eddy mixing. We also discuss some of the issues associated with designing an ocean-observation system to detect signals of ocean temperature trends on the continental above near the mouths of glacial fjords.