



Sea level changes due to ice sheet melting in Greenland

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Within the collaborative research program GROCE (Greenland Ice Sheet Ocean Interaction) funded by the German Federal Ministry of Education and Research, the role of the warming ocean in affecting processes and dynamics of the Greenland ice sheet, and of modifying interactions with the surrounding ocean are studied. The focus of the program is on the region around the 79°N glacier and the North East Greenland Ice Stream (NEGIS).

In our sub-project, we investigate the mass balance of Greenland and the sea level budget of the North Atlantic by jointly analyzing GRACE (Gravity Recovery And Climate Experiment) gravimetric data and sea surface heights via radar altimeter measurements. Furthermore, we will simulate relevant changes in temperature and salinity, which cause observable steric variations of sea level, with the global ocean model FESOM (Finite Element Sea Ice Ocean Model). The model will be locally refined in the surroundings of Greenland in order to capture coastal currents more accurately. Hosing experiments, where the freshwater forcing takes place at the glacier outlets, will be of particular interest; therefore we arrange a variety of melting estimates and compare the temporal and spatial evolution of the freshwater distribution by looking at passive tracers. Eventually, the aim of the sub-project is to confront and reconcile the observation-based Greenland mass balance and North Atlantic sea level budget with modeling results.