

Response of Greenland outlet glaciers to oceanic forcing: Results from numerical modeling on Petermann, Jakobshavn and Helheim Glacier.

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Oceanic forcing has been suggested as a major trigger for dynamic changes of Greenland outlet glaciers. Significant melting beneath the floating tongue and reduced support from sea ice or ice melange in front of the calving front can result in retreat of the terminus or the grounding line, and increases calving activities. Depending on the geometry and basal topography of the glacier, these oceanic forcing can affect the glacier dynamic differently. Here, we carry out a comparison study between three major outlet glaciers in Greenland and investigate the impact of a warmer ocean on glacier dynamics and ice discharge. We present results from a numerical ice-flow model applied to Petermann Glacier in the north, Jakobshavn Glacier in the west, and Helheim Glacier in the southeast of Greenland.†