



The Fate of Greenland's Permafrost - Results from High Resolution Transient Climate Simulations

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Simulations with global climate models (GCMs) clearly indicate that major climate changes for Greenland can be expected during the 21st century. Already now, there are substantial changes in sea-ice extent and thickness and a considerable increase in air temperature along the coasts of Greenland.

Contemporary global climate models (GCMs) have so far been unable to give a realistic representation of the dynamics of the Greenland ice sheet as well as of permafrost underlying the ice-free regions, due to their coarse resolution. Even relatively high-resolution regional climate models (RCMs) may fail in this respect. We have therefore conducted a transient simulation covering the period 1950-2080 with very high resolution for Greenland as a whole. Based on these simulations, we present modelled changes in permafrost in an unprecedented high resolution. We find that many areas that currently have permafrost will be losing ground ice over the next hundred years, and in some areas permafrost will thaw completely. The results of these projections will be used to make an assessment of vulnerability of infrastructure in Greenland.