



Climate Change over Greenland and Alaska in High-Resolution Transient Climate Simulations

M. Stendel, J.H. Christensen, G. Adalgeirsdottir, and M. Drews

Danish Meteorological Institute, Danish Climate Centre, Copenhagen 0, Denmark (mas@dmi.dk, 0045 3915 7460)

Climate and climate change in arctic regions have recently attained much attention. For a realistic assessment of the implications of the expected major climate changes for ecosystems and society, the resolution of both global climate models (GCMs) and contemporary regional climate models (RCMs) still is too coarse in many regions, for example in Greenland, where the narrow coastal regions and the steep gradients between these and the inland ice cannot be resolved.

We report results for the maritime region of western Greenland and the continental region of central Alaska from a transient RCM simulation covering the period 1950-2080 with a horizontal resolution of 25 km, forced by a state-of-the-art coupled GCM. Compared to the driving GCM, the RCM shows a considerably larger temperature response, in particular in Greenland in regions where sea ice retreats.

Even though both regions have comparable average temperatures, the climate change effect on permafrost is quite different. While subsurface temperatures in Greenland remain relatively cold, large areas in Alaska are subject to permafrost degradation towards the end of the century.