



Climate-vegetation interactions in Fennoscandia: Impact of the representation of vegetation in the regional climate model WRF

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The aim of this project is to examine the potential impacts of future forest management strategies of the Fennoscandian region on the regional climate. Modifications in the vegetation distribution and structure have an impact on terrestrial ecosystem functioning, which in turn affects local and regional climates via changes in surface energy budgets, carbon and water cycling. The climate change implications associated with such alterations must be accounted for and quantified to favor desirable forest management strategies and avoid implementing counter-productive approaches.

An accurate representation of the present-day climate-vegetation interactions is a prerequisite for increasing our understanding of upcoming climatic changes and our confidence in the simulation of the future climate. To this aim, recently developed, high-resolution maps of the Fennoscandian vegetation are introduced into the Weather and Forecasting model (WRF) to study the impact of vegetation representation on precipitation, temperature and radiative fluxes. Furthermore, a range of sensitivity tests are realized for a detailed investigation of processes driving the simulated regional climate and its response to vegetation changes. Different land parameterizations, domain sizes and spatial resolutions are tested in the regional climate model WRF. The outputs of these simulations are then compared with different types of observations (reanalysis, satellite observations and ground data) to identify the best configuration for simulating potential future climate impacts of forest management scenarios in Fennoscandia.