



Future snow conditions in Europe calculated by the EURO-CORDEX regional climate model ensemble

Katharina Bülow (1), Sven Kotlarski (2), Christian Steger (3), and Claas Teichmann (1)

(1) Climate Service Center Germany (GERICS), Climate Service Center Germany, Hamburg, Germany (katharina.buelow@hzg.de), (2) Federal Office of Meteorology and Climatology MeteoSwiss, Zurich, Switzerland, (Sven.Kotlarski@meteoswiss.ch), (3) Institute for Atmospheric and Climate Science, ETH Zurich, Zurich, Switzerland, (christian.steger@env.ethz.ch)

Surface snow cover plays an important role in regional climate systems, especially in mountainous and high latitude regions, where snow-atmosphere feedbacks can strongly influence meteorological conditions near the surface. This affects the ecosystem and in addition, human activities often rely on a certain amount of snowfall and snow cover in many of these regions. E.g., in some Alpine regions, part of the freshwater supply depends on the availability of meltwater originating from the surface snowpack. Also, winter tourism in many cases heavily depends on the availability of natural snow. Recent studies of past snow cover trends using observational datasets show a decrease in snowfall days and snow depth in many regions of Europe.

To investigate the future regional snow cover change in Europe, the multi-model ensemble of regional climate models from EURO-CORDEX assuming different emission scenarios on 0.11 ° horizontal resolution is used. The regional differences in changes of snow mass at different elevations as well as the duration of continuous snow cover are analysed. Investigating temperature and precipitation change as well as snowfall days will give some more detailed information on the impact of climate change in the mountainous regions.

In the 21. century, under the business as usual scenario (RCP8.5) the simulated snow mass decrease continuously with time. The amount depends strongly on elevation and region. Under the mitigation scenario (RCP2.6) the decrease of snow mass does not further decrease with time after the middle of the 21. century. A shortening of the duration of continuous snow cover is calculated and the extent of snow cover in northern Europe decreases, the rate depends on the choice of the emission scenario.