

Projected changes in snow conditions in Norway

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Annual accumulation of snow is directly influenced by changes in the climatic conditions. This study describes possible changes in the snow conditions in Norway, as a result of projected changes in climatic conditions from 1961-1990 to 2071-2100.

Projected air temperature and precipitation data from two global climate models (HadAm3 and ECHAM4/OPYC3) run with the B2 emission scenario were dynamically downscaled using the regional climate model HIRHAM, and also adjusted to local climate at weather stations in Norway. Furthermore, a spatially distributed hydrological HBV model was run using these daily data sets. The water balance was calculated both for specific river systems as well as for a 1 km × 1 km grid covering the Norwegian mainland. The focus in this presentation will be on maximum snow water equivalent, number of days per year with snow, first and last date of permanent snow cover, and the date of maximum snow water equivalent. Results are presented as countrywide maps and also in detail for 12 selected drainage basins.

The projections indicate that both the mean annual maximum snow water equivalent and the duration of the snow season will decrease almost everywhere in Norway. Generally, the relative change gets smaller with increasing altitude and distance from the coast. The start of the snow accumulation season is projected approximately 3-4 weeks later than in the present climate. The snow melt season starts earlier, leading to an earlier end of the snow season (approximately 1-7 weeks earlier). Maximum amount of snow is projected to shift from April/May to March/April, i.e. the snow melting floods will occur earlier in the spring than in present climate. In extreme years the maximum snow water equivalent might be higher than today in a few high altitude or northern drainage basins, implicating a potential for extreme spring floods in some regions