Snow depth, relative humidity, and total cloud cover for Poland based on downscaled EuroCORDEX ensemble.

Maciej Jefimow, Joanna Strużewska, Maria Kleczek, Anahita Sattari, and Aleksander Norowski
Institute of Environmental protection - National Research Institute (IOS-PIB), Department of Atmospheric and Climate Modelling, Poland (maciej.jefimow@ios.edu.pl)

In the frame of the project “Adaption strategies to Climate Change in Poland” the projections of snow depth, relative humidity, and total cloud cover were developed based on the EURO-CORDEX. The RCM results for an area covering central Europe with a resolution of 0.11 ° (approx. 12.5 km) were used. The analyses were carried out for the RCP 4.5 and RCP 8.5 scenarios.

To represent better the local variability the statistical correction (quantile mapping) was applied based on various historical gridded datasets (ERA5- reanalysis and IMWM- observation data from the National Meteorology Institute, for the snow depth and relative humidity, and ERA5 and EUMESAT- satellite data for total cloud cover). Ensemble analyses were undertaken to assess the projection uncertainty. For the snow cover and humidity, eleven ensemble members were used, while for the cloud cover there were fourteen models for RCP4.5 and 26 models for RCP8.5.

We will present ensemble spread analysis and RMSE for the reference period to show the credibility of climate projections. In terms of the predicted tendency in both scenarios, in the analyzed domain, snow depth in the future climate shows a downward trend, with a more visible dynamic in scenario RCP 8.5 up to 50% in terms of the number of days with snow cover by the end of XXI. In the case of relative humidity and total cloud cover, stable trends are visible, with no clear change. Also, we will address the changes in the seasonal pattern of the analyzed parameters.

Project results are available via the interactive portal: https://klimada2.ios.gov.pl/klimat-scenariusze-portal/