



Validation of highly resolved regional climate simulations of the Carpathian Mountains

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To assess future climate impacts in the Carpathian Mountains high resolution data sets for past, present and future climate are required. These imperative data sets shall be provided within the European Union funded project "HABIT-CHANGE" where the regional climate model COSMO-CLM (CCLM) has been applied to calculate the climate information. Apart from the past and future simulations driven with the Global Circulation Model ECHAM5, a hindcast simulation driven with ERA40 reanalysis data for the period 1961-2000 has been carried out. To evaluate the uncertainty emerging from the regional climate model, an extensive analysis of the hindcast simulation was accomplished. The simulations cover the Carpathian Mountains in a 10km x 10km horizontal resolution.

The motivation for the in-depth analysis of the model performance is a parallel study carried out for the Greater Alpine Region. The results of the study indicated that the bias, correlation and trend in temperature and precipitation show a dependency on elevation in the model output, which cannot be seen in the observations. The origin of the model discrepancy is not known, however several factors in modelling approach and data analysis could be identified as possible reasons for the model disagreement. Therefore, we perform a similar evaluation of the modelling results for the Carpathian Mountains in which we investigate occurrence, magnitude and extent of elevation dependence of climatic parameters. We compare the model performance between the two different mountainous regions in order to evaluate possible causes for the model uncertainties.