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RCM-based climate prediction for the Carpathian basin using RegCM simulations

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Model RegCM is a 3-dimensional, sigma-coordinate, primitive equation model, and it was originally developed by Giorgi et al. Currently, it is available from the ICTP (International Centre for Theoretical Physics). For adaptational test runs, we used the European Centre for Medium-Range Weather Forecast (ECMWF) reanalysis datasets (ERA-40) as boundary conditions. According to the validation results for the 1961-1990 period, seasonal mean temperature is generally underestimated and seasonal precipitation amounts are overestimated by RegCM.
In the frame of the CECILIA EU-project, model experiments for three different time slices (1961-1990, 2021-2050, and 2071-2100) have been accomplished for the Carpathian basin and its vicinity. The horizontal resolution of RegCM is 10 km and it has been run with 18 vertical levels. The initial and lateral boundary conditions of the fine-resolution experiments have been provided by the ECHAM-driven RegCM simulations using 25 km horizontal resolution for the A1B emission scenario.
The results suggest that the seasonal mean temperature in the selected domain is likely to increase by about 1°C, and 2,5-3°C by the middle and the end of the 21st century, respectively. Precipitation in the Carpathian basin is generally projected to decrease, especially, in summer and spring.