



Validation of recent ALADIN-Climate simulations over Central Europe and Hungary

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In the Programme entitled Adaptation to Climate Change in Hungary, a National Adaptation Geographical Information System (NAGiS) has been established in 2014 to support planning and decision making related to adaptation. The most essential input of NAGiS is provided by future climate projections, aiming to serve high-quality and fine-resolution climate model data for Hungary. Climate change information in NAGiS is based on several regional climate models in order to quantify the projection uncertainties. The models are going through the standard steps of making climate projections; e.g., their settings are tested in sensitivity studies, results are validated to assess their ability to reproduce climate features of a reference period. This study is focusing on validation results of ALADIN-Climate model adapted by the Hungarian Meteorological Service in 2005. Since the adaptation, numerous ALADIN simulations were performed with different settings. The model version was recently updated to version 5.2 and also a new, larger integration domain was chosen for the current experiments; therefore, a detailed validation was necessary. Two simulations have been conducted using different lateral boundary conditions: ERA-Interim reanalysis data and a 50 km resolution ALADIN-Climate experiment driven by ARPEGE-Climat global model performed in EURO-CORDEX. The temperature and precipitation results were validated for 1981–2000 against E-OBS v10.0 data over Central Europe and a national homogenized measurement dataset, CARPATCLIM over Hungary. Both simulations show a temperature underestimation with the annual average bias under 1 °C, and the reanalysis driven simulation is slightly closer to measurements. Regarding total precipitation, overestimation is typical (with 20-40%) over large part of the domain and the ARPEGE-driven simulation gives more accurate results. The presentation aims at introducing the validation outcomes in detail, additionally, for the sake of completeness, a comparative study is also shown to assess the significant differences between the two observation datasets applied over Hungary.