



The potential selection of the most appropriate setup of RegCM to contributing to the national climate change scenario of Hungary

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After a few years of its compilation the first National Climate Strategy in Hungary was accepted in 2008. It emphasised the necessity of regular revisions, which is currently in progress. In addition to the second National Climate Strategy, an extension is prepared including the National Adaptation Strategy and the Decarbonization Plan. The very basis of the climate strategy and its extension is the simulation results of global climate models (GCMs) and regional climate models (RCMs). The RegCM is one of the four RCMs adapted and used in Hungary. The RegCM is a 3-dimensional, sigma-coordinate, primitive equation model, originally developed by Giorgi et al. Currently, it is available from the ICTP (Abdus Salam International Centre for Theoretical Physics). In order to select the most appropriate setup version of the RegCM, this study compares the different simulations of RegCM4.5 with 10 km horizontal resolution for the past using hydrostatic and non-hydrostatic approaches, and different parameterisations for the treatment of moisture. Subgrid Explicit Moisture Scheme (SUBEX) is used to handle non-convective clouds and precipitation resolved by the model. The new microphysics scheme allows for a proper treatment of mixed-phase clouds and a physically more realistic representation of cloud microphysics and precipitation. All the simulations use the ERA-Interim reanalysis data (with 0.75° horizontal resolution) as initial and lateral boundary conditions. The RegCM simulation outputs are validated against the homogenized, gridded CarpatClim data (with 0.1° resolution).