



Projections of hydroclimatic conditions using an ensemble of regional climate model simulations for the Pannonian region – a comparison of the plain area in Hungary and Serbia

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Global warming certainly affects many European regions including the Pannonian basin, which is in the special focus of the PANNEX initiative. In the framework of this Regional Hydroclimate Project of GEWEX (Global Energy and Water Exchanges Project), a bilateral research cooperation program runs between Serbia and Hungary with the ultimate aim to assess hydroclimatic conditions in the region. For the past, gridded CarpatClim data as well as individual station data is used to evaluate the recent trends in the plain areas of the two target countries. These initial studies serve as validation for the simulated data using historical regional climate model simulations. Besides, our joint research evaluates the projected hydroclimatic conditions using regional climate model (RCM) simulations with the RegCM model adapted for the Pannonian basin and other RCM simulations available from the EURO-CORDEX database. The target area requires fine scale simulations (downscaled from global climate model simulations), which were carried out with 0.11° horizontal resolution for both the RCP4.5 and RCP 8.5 scenarios (assuming 4.5 W/m² and 8.5 W/m² radiative forcing change, respectively, by 2100 relative to the pre-industrial era). The precipitation-related climatic changes are analysed using monthly, seasonal and annual means as well as extremes. Our results are especially important for various sectors (e.g. agriculture, water resources management, energy production, etc.), which are affected by hydroclimatic extremes resulting in severe direct and indirect consequences. Moreover, they can serve as the key basis and input information of the development of specific adaptation strategies at local, regional or even national levels.