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Climate change impact on flood characteristics in southwestern Hungary

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As a consequence of global climate change, several weather-related regional impacts occurred in the last decades throughout the Earth, which already did or may have induced crucial problems. One of them is modification in hydrological processes, which may result in natural, environmental and ecological damages in forms of floods, flash floods, inland water events, and even droughts. In order to reduce the overall socio-economic impacts of these potential hazards, it is essential to investigate future climatic trends and its hydrologic responses, with special regard to the extremes.
Changes of hydrological processes in the basin of River Kurd located in southwestern Hungary are analysed in this study. For the investigation of regional/local hydrology, the DIWA (DIstributed WAtershed) model is used, which considers several aspects, e.g., topography, soil type, local drainage direction, saturated vertical/horizontal hydraulic conductivity of the O-horizon, etc.
In order to achieve our research aim,
- first, the GIS-based distributed hydrological model DIWA has been adapted for the target basin.
- Then, we calibrate and validate the DIWA model using historical meteorological and run-off data.
- After that we run the calibrated DIWA model for the past (1981–2010) and the future (2071–2100) using climate data provided by the RegCM4 regional climate model, which is adapted for the Carpathian Region by the Department of Meteorology, Eötvös Loránd University. The completed RegCM4 simulation with a horizontal resolution of 10 km takes int account the RCP4.5 scenario in the future.
- Finally, we compare the characteristics of extreme floods in the two periods. Furthermore, estimations of future characteristics of high flows and flood events are assessed for the catchment of River Kurd.
In this presentation, the results of simulation-based analysis of influence of climate change in the River-Kurd's basin on extreme flood events will be reported.