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# Evaluation of different interpolation schemes for precipitation and reference evapotranspiration and the impact on simulated large-scale water balance in Slovenia

Qianwen He (1), Frank Molkenthin (1), Frank Wendland (2), and Frank Herrmann (2)

(1) Environmental Informatics, Brandenburg University of Technology (BTU) Cottbus – Senftenberg, Cottbus, Germany, (2) Institute of Bio- and Geosciences, Forschungszentrum Juelich, Juelich, Germany

Precipitation and reference evapotranspiration (ET0) are two main climate input components for hydrological models, which are often recorded or calculated based on measuring stations. Interpolation schemes are implemented to regionalize data from measuring stations for distributed hydrological models. This study had been conducted for 5 months, with the aim of: (1) evaluating three interpolation schemes for precipitation and reference evapotranspiration (ET0); (2) assessing the impact of the interpolation schemes on actual evapotranspiration and total runoff simulated by a distributed large-scale water balance model - mGROWA. The study case was the Republic of Slovenia, including a high variability in topography and climatic conditions, with daily meteorological data measured in 20 stations for a period of 44 years. ET0 were computed by both FAO Penman-Monteith equation and Hargreaves equation. The former equation is recommended as the standard equation, while the ET0 calculated by the latter one for Slovenia had a certain deviation (+150 mm/a) from it. Ordinary Kriging, Regression Kriging and Linear Regression were selected to regionalize precipitation and ET0. Reliability of the three interpolation schemes had been assessed based on the residual obtained from cross-validation. Monthly regionalized precipitation and ET0 were subsequently used as climate input for mGROWA model simulation. Evaluation of the interpolation schemes showed that the application of Regression Kriging and Linear Regression led to an acceptable interpolation result for reference evapotranspiration, especially in case the FAO Penman-Monteith equation was used. On the other hand, Regression Kriging also provided a more convincing interpolated result for precipitation. Meanwhile, mGROWA simulation results were affected by climate input data sets generated by applying difference interpolation schemes. Therefore, it is essential to select an appropriate interpolation scheme, in order to generate a convincing climate input.