



Quantitative comparison of estimation methods for rainfall-runoff model parameters in ungauged basins

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In ungauged catchments, where no discharge data are available calibration and validation methods cannot be used for estimating rainfall - runoff model parameters. Parameter values of the model can be assessed (transferred) by regionalisation methods from gauged catchments, where parameters are specified by model calibration to observed runoff. In this case, the process of regionalisation can be defined as spatial transferring and generalising hydrological components, methods, models and model parameters, with a strong emphasis on scaling issues. In this paper various methods for the estimation a rainfall-runoff model parameters in ungauged basins based on geographical location are presented. The Hron River basin in Slovakia with available daily flow, precipitation and air temperature time series needed for calibration to obtain model parameter values in 23 subcatchments was selected as a pilot region in the study. The rainfall-runoff model was calibrated using a daily time step at these subcatchments. Global and Local mean method and subsequently the Inverse distance weighting and Kriging interpolation methods were used to regionalise the model parameters in the subcatchments. To verify the results of these methods, Jack-knife cross validation was applied. Finally, the effectiveness of the estimation method for ungauged basins was tested. This was performed by comparing the model simulations to observed hydrographs and computing Nash-Sutcliffe optimization criterion. The best results were achieved using the interpolation method Kriging, which can be recommended in prac-

tice for the estimation of rainfall-runoff model parameters in ungauged catchments in this region. Model parameters of the rainfall - runoff model estimated by all these methods and estimated by the model calibration were used for modelling mean daily discharges and the results were finally compared and discussed.