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# Uncertainty in rainfall-runoff modelling: an application of GLUE approach to the Rome's urban area.

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Most problems in hydrological forecasting require the identification of appropriate model structures or parameter values. This is usually accomplished by model calibration techniques, which aim at comparing observed and predicted responses and attempting to improve some measure of model performance. There is a very extensive literature on methods of model calibration. In this work we focus on a widely applied approach which rejects the concept of an optimal model in favour of the equifinality concept of allowing for multiple acceptable models, i.e. multiple models may provide acceptable simulations of the response of the system of interest. This is the basis of the Generalized Likelihood Uncertainty Estimation (GLUE) approach, which is used here as a tool for estimating the predictive uncertainty of a rainfall–runoff model. The GLUE methodology investigates the possible equifinality of different parameter sets and assesses the likelihood of a parameter set to being an acceptable simulator when model predictions are compared to observational data. Our work is intended to analyse the influence of different likelihood measures and acceptability thresholds on the uncertainty analysis in the rainfall–runoff modelling of a case study catchment in the suburb of Rome, Italy.