Geophysical Research Abstracts, Vol. 10, EGU2008-A-08468, 2008 SRef-ID: 1607-7962/gra/EGU2008-A-08468 EGU General Assembly 2008 © Author(s) 2008



Parameter calibration and uncertainty estimation of a simple rainfall-runoff model in two case studies

X. Zhang (1), G. HÃűrmann (1) and N. Fohrer (1)

(1) Department of Hydrology and Water Resources Management, Ecology Centre, University of Kiel, xzhang@ecology.uni-kiel.de

A simple rainfall-runoff conceptual model KIDS (Zhang et al. 2007) using PCRaster was applied to simulate continuously daily discharge of two river basins: the small lowland Kielstau catchment in Germany and the mesoscale mountainous XitaoXi basin in China. With the given model structure, this work focuses on the parameter calibration procedure and, in particular, the assessment of model prediction uncertainty. We explored a joint approach to calibration and uncertainty estimation. Based on an initial absolute sensitivity analysis of six parameters for each basin, a sampling range of each parameter was established. Then the performance of the model was assessed with around 2000 sets of random parameter values within the selected ranges, to derive the probability distribution pattern of all parameters, and to set simulation confidence limits. From this analysis, key sensitive model parameters were identified in these two case studies. Their strong dependence on site-specific conditions can be observed as well. The top ranked parameter sets achieved modelling efficiencies of 0.81 (Kielstau) and 0.68 (XitaoXi) respectively. The model prediction uncertainty associated with parameter estimation cannot always bracket the observations, indicating that further investigation in model structure or input data may be needed.