

Interactive comment on “Conditioning rainfall-runoff model parameters for ungauged catchments and land management impacts analysis” by N. Bulygina et al.

T. Wagener

thorsten@engr.psu.edu

Received and published: 3 April 2009

This paper presents a great next step towards a fully Bayesian approach to PUB. It builds nicely on previous work that has been published and is cited here. Below are a few comments to further put the paper in context and to potentially strengthen some points made by the authors.

[1] One thing that you could be utilized a bit more are the experiences with regionalized or conditioned parameters of the model you are using from others: [1] Zhang et al. (2008, WRR) show to which constraints the model parameters are sensitive (their Figure 6). Your figure 5 shows exactly where BFIHost as a constrained fits in. Both

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



together might provide insight into how many constraints are needed! Both papers use the same hydrological models and both have the UK as a study region which makes the comparison very straightforward. [2] Parameter kf (or kq in our case) is the one parameter next to alpha that often regionalizes well (see results of Lamb 1999, WRR and Wagener and Wheater, 2006, JoH). Some further discussion on which parameters could be derived how would be good. [2] Why is b always the most difficult parameter? This is the one parameter in PDM type models that seems to be most tricky. How could we solve this issue? [3] What are the computational demands to derive a generic Bayesian framework and what are potential future bottlenecks that have to be overcome to extend this approach further? [4] The referencing needs checking!

REFERENCES

Lamb, R. (1999), Calibration of a Conceptual Rainfall-Runoff Model for Flood Frequency Estimation by Continuous Simulation, *Water Resour. Res.*, 35(10), 3103–3114.

Wagener, T. and Wheater, H.S. 2006. Parameter estimation and regionalization for continuous rainfall-runoff models including uncertainty. *Journal of Hydrology*, 320(1-2), 132-154.

Zhang, Z., Wagener, T., Reed, P. and Bushan, R. 2008. Ensemble streamflow predictions in ungauged basins combining hydrologic indices regionalization and multiobjective optimization. *Water Resources Research*, 44, W00B04, doi:10.1029/2008WR006833.

Interactive comment on *Hydrol. Earth Syst. Sci. Discuss.*, 6, 1907, 2009.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

