

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

**T. Wagener**

thorsten@enr.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  $k_f$  (or  $k_q$  in our case) is the one parameter next to  $\alpha$  that often regionalizes well (see results of Lamb 1999, WRR and Wagener and Wheeler, 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 Wheeler, 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](#)