**Hydrology and
Earth System
Sciences**

Open Access

Discussions

Interactive comment on "The influence of conceptual model structure on model performance: a comparative study for 237 French catchments" *by* W. R. van Esse et al.

J. Parajka (Referee)

parajka@hydro.tuwien.ac.at

Received and published: 19 June 2013

General comments

This study compares runoff model performance of different conceptual model structures for large number of catchments in France. The main objectives are to examine factors that control the relationship between model structure and model performance. The results indicate that the use of a power function describing reservoir outflow significantly increases mean runoff model performance. However, increasing model complexity does not always lead to larger model performance. The results show that runoff

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

model efficiency in validation periods is generally larger in wetter and larger catchments.

Overall, the study is interesting and within the scope of the journal. The paper has a good structure and is concisely written. In addition to Ross Woods comments, I have only a few remarks, which might be considered before publication:

1) The part of the story related to the comparison of fixed and flexible model structure is not clear to me. Is the intention to test two tools (models)- one having the option to test different structures and one having just a fixed one? Or to examine factors controlling the performance of different structures in general? I do not see a clear difference between particular model structure within the "flexible" approach and the GR4H "fixed" structure .

2) I would suggest to extend the results section (instead of a brief description in the discussion) and to show in more detail the factors controlling the (in)consistent and poor model performance. This part is very interesting and highly relevant for recent Panta Rhei decade.

3) For a more direct comparison with other studies, it would be interesting to indicate how to translate the CR1-CR4 criterion to a commonly used volume error and Nash-Sutcliffe efficiency.

Specific comments

1) Table 2: Some of the names of classification categories are potentially misleading. For example, I would suggest to use "larger" catchments instead of large (as 600km2 is relatively small to some e.g. 100000km2 catchment). Why not to use the Aridity instead of Wetness Index?

2) p.6, l.20: this sentence is not clear: "water might be lost to potential evapotranspiration."

3) Discussion: It would be interesting to provide some comments, how to select a right

model structure for particular climate/catchment conditions.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 5457, 2013.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper