

Interactive comment on “A High-Resolution Dataset of Water Fluxes and States for Germany Accounting for Parametric Uncertainty” by Matthias Zink et al.

Anonymous Referee #3

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In the submitted manuscript “A High-Resolution Dataset of Water Fluxes and States for Germany Accounting for Parametric Uncertainty” Zink et al. present a new approach to calibrate a distributed model (the mesoscale Hydrological Mode mHM) across all basins across Germany on a 4x4km² resolution. They use a 2 step calibration procedure, during which they firstly calibrate 7 major basins individually, and, secondly use a subset of the calibrated parameter samples with sufficient performance (NSE>0.65) at all 7 basins to apply them over the remaining catchments over Germany. Using split-sample tests and auxiliary information (AET, soil moisture, recharge) they evaluate the model and the combined parameter set concerning its general performance and uncertainty. Overall, the approach is well chosen and the provided results make sense.

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However, the manuscript needs serious improvements before it can be considered for publication in HESS. Most of the points of criticism are related to the need for more rigorousness:

- The introduction is too short and does not provide a proper view on the research gaps of the approaches and methods applied in this study (for instance calibration and model evolution approaches). It appears to be series of vaguely related short paragraphs -> a more robust story line is needed.
- The methods are incomplete, partially referring to previous research, partially omitting parts of the analysis that later appears in the results section. On the other hand some information is irrelevant. Very important information, for instance introducing the model parameters that are calibrated, is completely missing. Up to the end of the manuscript it is not clear, which parameters were calibrated, which ranges were used and there was no discussion of their physical meaning.
- There is generally too little referencing of other studies. In particular in the Results and Discussion section, there are some interpretations that are hardly supported by the results and almost no comparison to the research of others.
- In general there is a lack of self-criticism. There are many obvious and hidden assumptions in the approach and the authors should spend significantly more effort discussing them.

For all these reasons, which are elaborated in more detail in the commented pdf, I recommend major revisions. I am convinced that the approach and the results are novel and reasonable but the authors have to show this in a rigorous scientific way.

Please also note the supplement to this comment:
<http://www.hydrol-earth-syst-sci-discuss.net/hess-2016-443/hess-2016-443-RC3-supplement.pdf>

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