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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Parameter uncertainty analysis for an operational hydrological model using residual based and limits of acceptability approaches" *by* Aynom T. Tweldebrahn et al.

Anonymous Referee #1

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Review of "Parameter uncertainty analysis for an operational hydrological model using residual based and limits of acceptability approaches"

The manuscript is well-written and in line with the scope of this journal. It targets three different objectives: (1) uncertainty quantification / parameter estimation applied to an operation hydrological model; (2) investigation of the impact of using additional data to the output of the parameter estimation procedure; (3) assessment of using a time-relaxed (instead of limits-relaxed) GLUE LOA approach.

The approach is technically sound. Many aspects are addressed in a practical way, based on best-practices or heuristic approaches, leaving room for future more

theoretically-oriented investigations. The approach here is fairly justified by the objective of applying the methodology to a real-case scenario.

The conclusions are supported by an adequate number of tables and figures. As highlighted in one comment below, I think that the authors should provide more insights related to the interpretation of these results.

For these reasons, I would recommend to accept it with minor revision.

Detailed comments:

1 - Introduction: page 1, line 23: add reference or short inline explanation about the context for those readers who are not familiar with this company

2.1 - The hydrological model page 5, line 3: please add more information about the rationale behind the choice of these seven parameters and the corresponding low/high bounds.

2.2 - Study area and data I would suggest to add a figure depicting a map of the study area

3 - Results Figure 4 is not well readable in my opinion, because the variables are misaligned. An option could be to build a grid of subplots, leaving axis labels outside the grid and reporting the scatter plots of interest on the upper-diagonal cells and, for example, correlation values on the lower-diagonal. I leave the final decision to the authors. Page 10, line 13: why the validation results pertaining to year 2014 was not included in the corresponding figure 6? Please also elaborate on what are the possible motivations behind the poor performance of the behavioral models evaluated using LnNSE in year 2014.

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