

Interactive comment on “Incorporation of rating curve uncertainty in dynamic identifiability analysis and model structure evaluation” by S. Van Hoey et al.

Anonymous Referee #1

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The paper is about incorporating of rating curve uncertainty in model evaluation using dynamic identifiability analysis. The question raised by the title is interesting, how incorporating rating curve may help modelers to avoid type I and II errors. However I have to express my concern about the content of paper as well as the structure.

The paper is not well structured in my point of view. The literature review of different method should not be spread over the entire paper; it should be presented in a way that gives readers the ability to understand the relevance of previous studies and this study.

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The title and research question is interesting; however I did not find the methodology proper to answer the research question. Logically if the authors want to compare the effect of rating curve on model structure they should look how models perform for calibration on different discharges obtained by rating curve and see how different the parameter ranges become. I completely missed the link between rating curve analysis and model evaluation.

Flexible model structure is an interesting approach for hypothesis testing, it is a laboratory in which different model structures representing different hypothesis can be evaluated. However, it can be misleading if it is not handled carefully; higher uncertainty in parameter estimation does not necessary mean poorer model structure for chosen catchment. Moreover comparing different model structure within Flexible framework is subjected to careful scrutinization, and with model structures with completely different development background the comparison should be based on many other observed data which in this case study seems to be absent.

The paper, simultaneously, tries to look at model consistency over different conditioned (wetting, drying and . . . periods). This opens another front of investigation, which is parameter stability over time, but the authors did not mentioned relevant studies which have been done in this regard.

The case study should be more transparent, the objectives of paper should be set up more clearly and the answer to the research question should be given more accurately backed with strong reasoning. Overall, in my point of view, the paper should be rejected in this form.

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