

Reviewer #1 (Hoshin Gupta)

Comment:

I found little in the substance of this opinion paper to disagree with. My main comments have, therefore, to do with the fact that the presentation tends (I suspect partly unintentionally) to come across as a defense of the TD approach, rather than a balanced evaluation of the strengths and weakness, and complementary nature, of the TD and BU approaches. Certainly in the Gupta et al (WRR 2012, Model Structural Adequacy) paper, of which Clark is a co-author, we argued for the commonality of underlying structure of most if not all hydrological models based on the steps involved in model building, and the need for more cross- fertilization across the modeling community. I very much like the fact that the authors of this paper emphasize the issues of the perceived (but unnecessary) conflict between the TD and BU approaches, but I feel that the argument could be refined and made more balanced by taking note of the fact that many of the points raised in defense of TD modeling are really more general comments that apply to all levels of model complexity – from BU to TD, and revising many of the concluding comments appropriately.

Reply:

We highly appreciate the reviewer's very positive assessment. After re-analysing the manuscript from the perspective of all reviewers, we agree that it comes across more like a defence of conceptual models rather than the intended balanced evaluation of modelling strategies. We will accordingly re-structure and re-formulate the relevant sections in the revision.

Having said that, and given that also the other reviewers noted that the paper should be less a defence of conceptual models, we would also like to stress one, potentially not irrelevant point: "Physically-based" models may largely benefit from a semantic-psychological bias. The term "physical-based" inherently implies that they are "correct" descriptions of real world-systems, which further implies that all other models are not "physical" and thus less "correct". From this perspective, we believe that any type of comparison between different strategies will to some extent necessarily come across as a defence of conceptual models, i.e. explanations of why they can be as meaningful representations of reality as physically based models. In other words, already the term "physically-based" puts models in the (often not really justified) position of benchmarks other models have to be compared to, even if they are not necessarily "better" descriptions of reality.

Comment:

Below, I provide the summary I prepared (of major points presented) while reviewing the paper. While doing so, I found myself generalizing some of the comments made to extend to both TD and BU modeling, and slightly reorganizing the concluding comments. I provide them here in case it helps the authors to see these remarks from a slightly different perspective, and hereby to be useful in strengthening the paper.

Reply:

We thank the reviewer for the reorganization and generalization of the main points. We believe these adaptations will add substantial value to the manuscript and we will adjust the text accordingly.

Comment:

In conclusion, I commend the authors on a very nice commentary.

Reply:

We thank the reviewer very much for this encouraging assessment!