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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Impact of modellers' decisions on hydrological a priori predictions" *by* H. M. Holländer et al.

Anonymous Referee #2

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I have to say that I am very disappointed with this paper on many grounds.

1) I guess it is now too late to comment on the study design, but for completeness I will make this comment anyway. First of all, I seriously question whether this problem can even be related to the "predictions in ungauged basins" problem, considering that this is a totally artificial, almost unique catchment. Almost all of the models used here derive their origins to their development and application in a particular climatic or landscape context, and when you extrapolate to some other place you assume implicitly some kind of similarity: this completely broke down here.

2) Given the nature of the catchment (small, artificial etc.) I have to appreciate the courage (or bullheadedness) of the participants who volunteered to use TOPMODEL

or SWAT (or even any of the other models). They had "no chance in hell" of getting the runoff responses right in this case. What thought processes were gone through in choosing to apply these models? I can only think that they were chosen, in a perverse way, to show hydrological models and modelers in a bad light.

3) Now I come to the main criticism of the paper. Really, I did not get anything useful from this paper. This way of idiosyncratic, anecdotal presentation is totally unhelpful. My problems come from two sources: (i) I do not know much about the catchment (no information is provided to guide me, and (ii) I do not know much about the idiosyncracies of the various models. How am I expected to read through page after page of details (this model, this process, this parameter etc....) and still gain some wisdom out of the paper. All this material should appear on the first day of a brainstorming session on model inter-comparisons, but by the third day something profound should come out, and that distilled essence is what should show up in the paper. The "ball by ball description" of the minutiae of detail can be avoided in a paper like this. It puts the whole exercise in a bad light.

4) As a way to guide the authors towards this, I have a suggestion. I assume that the authors have now come to the final stage of their experiment. I think they should use the hydrologic data they have collected so far, i.e., rainfall, runoff, soil moisture (and any other internal or surrogate information) to piece together (without the benefit of any model) what actually happens or happened on this catchment. Surely, they now have a better clue on this, at least as best as they can. They can extract all kinds of metrics and signatures on the observed variability. This summary will satisfy me on learning about the catchment and its hydrology. This was my first point earlier (getting to know the catchment).

5) Then they should evaluate performance of each model juxtaposed against the actual observed response. This will expose the fundamental strengths and weaknesses (including their inappropriateness for this application). This will bring the focus back to the model structures and process descriptions in each model, and away from the

pure litany of detail that is presently there. It will provide structure to the paper, and will become an object lesson to future modelers.

6) In fact, if at all possible, the authors should develop minimalist model(s) on the basis of the rainfall-runoff data they have collected, and in this way throw light on the essential or dominant processes happening, and this is another vehicle they can use to throw light on the strengths and weaknesses of the models.

7) The object lesson for me (something that the authors can expand on) is the value of even minimal amount of rainfall-runoff data before one does any kind of modeling, in any kind of circumstance. Even a month (let alone year) worth of data is far in excess of what you can learn from soils data or field visits. This may be disallowed in PUB, but this modeling study has demonstrated the folly of believing all the nice process theories in the classroom for predicting the real world, even in the case of a human-made catchment (even more so I would say).

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 8875, 2013.