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Discussions

Interactive comment on "On the lack of robustness of hydrologic models regarding water balance simulation – a diagnostic approach on 20 mountainous catchments using three models of increasing complexity" *by* L. Coron et al.

Anonymous Referee #3

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1. This paper shows that conceptual hydrological models generate volumes errors when applied outside the calibration period. The analysis was conducted using 3 models and 20 catchments. The results appear quite independent on the model used. However, different catchments may be characterized by different types of errors.

2. Although the paper does a good job in illustrating that a problem exists, it leaves several open questions, and as a result, it sounds somewhat incomplete. The paper shows that robustness problems in rainfall runoff modeling are common, but it does not

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answer the question of why these problems exist. The paper attributes this problem to the models themselves, but it could very well be a problem of the data, including discharge, precipitation, and potential evaporation estimates.

3. Some additional analyses could be helpful to investigate this in more detail. For example, I see from fig. 5 that precipitation and discharge time series are quite well correlated. The difference between them is the actual evaporation. How does the actual evaporation correlate with the potential? And how does the actual evaporation from different catchments correlate with each other? There should probably be some correlation, which could give some indication of potential uncertainties in the data, and particularly in the evaporation data.

4. Similarly, how do precipitation and discharge estimates from the different catchments correlate? Can this be used to say something about data uncertainty?

5. How do the anomalies observed in different catchments correlate? Are they all different, or are they similar?

6. The Authors could show the temporal dynamics of parameter estimates. These could give indications on how model structures compensate for data inaccuracy. I think this is quite interesting and could be a good complement to the paper.

7. These analyses could in place of paragraph 4.4, and the resulting figures, which do not add much to the paper.

8. A minor comment on Figure 4 panel c. The lines and corresponding dots on the x-axis could be of different color.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 11337, 2013.