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Geoscientific Model Development Discussions

Interactive comment on "The Wageningen Lowland Runoff Simulator (WALRUS): a lumped rainfall–runoff model for catchments with shallow groundwater" *by* C. C. Brauer et al.

Anonymous Referee #1

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The article presents the WALRUS model, a parsimonious conceptual rainfall-runoff model. Reading this paper reminded me the time I was a student and Piet Warmerdam had kindly sent me the details of the Wageningen model that I tested and found efficient. So I am pleased to see that work on this model is still ongoing and that great progress was made over the past years.

I found the article very clearly presented. I have only a few comments below. I think the article could be published after minor revision.

Detailed comments

1. p. 1358, lines 4-5: I am not sure conceptual models were mostly developed for

mountainous catchments. Or maybe mountainous is not the right word here (same comment p. 1358, lines 16 and 25).

2. p. 1359, line 6: The way the WALRUS model is presented seems to indicate that it is a simulation model rather than a forecasting model (see e.g. the discussion on terminology by Beven and Young, 2013).

3. p. 1360, line 21: "values lead"

4. p. 1361, lines 24-26: This is an interesting point. Could the authors detail a bit more the limitations identified by the users on the previous model version and the way these feedbacks were collected and analysed?

5. p. 1362, lines 10-12: I quickly went through the companion article submitted in HESSD, which I found interesting. Since model evaluation is detailed in that paper, may I afford to make a suggestion to the authors on this other paper? I would find useful to have the performance of the new WALRUS model compared to the previous version of the Wageningen model on the two test catchments, to better quantify the improvements brought by the new modules and formulations.

6. p. 1371, lines 1-15: I found this test not so useful but I leave the authors decide whether it should be kept in the paper.

7. p. 1378, lines 21-25: It was not fully clear for me how this function is formulated in case no observation series are available. Is it parameterized?

8. p. 1382, section 5.2: Despite this initialization, it is probably still necessary to have some warm-up period. How this is managed in the software? Is there a 1-year default warm-up period? Can this be adjusted by the user? Is there any difference between long-period and event applications?

9. p. 1383, section 5.3: Could the authors explain whether there are differences in the way parameters are optimized when the model is applied on a long continuous period or on events. For example, there are parameters responsible for low flows, which may

not be well-identified in case the model is calibrated on flood events only.

10. Table 2: The b parameter values for the two study catchments seem to be well outside the expected range of values shown in the table. How can this be explained? Do the parameters compensated for modelling errors during the calibration process?

11. Fig. 1: I am not sure this figure is very useful, but I leave the authors decide whether it should be kept in the paper.

12. Fig. 4: Why dv appears twice in the vadose zone?

13. Fig. 11: Add the symbols on the lines in the legend, so the differences between lines are clear if the article is printed black and white.

Cited references

Beven, K. and P. Young (2013). A guide to good practice in modeling semantics for authors and referees. Water Resources Research 49(8): 5092-5098.

Interactive comment on Geosci. Model Dev. Discuss., 7, 1357, 2014.