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Hydrology and Earth System Sciences Discussions

Interactive comment on "Soil buffer limits flash flood response to extraordinary rainfall in a Dutch lowland catchment" *by* C. C. Brauer et al.

Anonymous Referee #1

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General Comments

I read the paper with interest as it describes a well-conceived data-based case study of an extreme hydrologic event. The study is comprehensive: it considers a wide range of data from rainfall to ground water to channel hydraulics. The authors discuss the limitations of the instruments and the data used in their study. Because of the significant scope of the issues involved the discussion is often limited and the references not necessarily cover a historical perspective of relevant developments. But I do not find this critical for the case study discussion.

The paper would benefit from another round of editing; this regards not only several typographic mistakes (e.g. Abstract), but also the style. While the grammar is correct, the level of writing is uneven. There are very well written sections and there are other

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sections that a good writer/editor would have no difficulty improving. I am guessing that several authors have contributed text to this manuscript but nobody took the time to unify the style.

The figures are also a collection of styles. While overall I would rate them as better-than-average (considering only the hydrologic literature), they could be improved. Combining graphs and photos is an effective way of communicating the message the authors want to convey but poor choices of fonts, colors, legends take away the quality.

Specific Comments

Abstract.

Too many details. State the key points only. The last paragraph is disconnected.

Introduction.

First paragraph. The way you structured the text, you should limit the references to the European studies. If you want to include the US studies you should rewrite the paragraph.

Page 113. All well-known generalities. This is a hydrologic sciences journal after all.

I don't think the authors should report rainfall values to .1 mm. The uncertainty analysis/discussion provided (as well as that in the literature) does not support such precision.

Paragraph (Line 15): the paragraph contains many typographical errors with the units and values. The authors should proof the paper before submitting it. Line 24: what is "vigorous hydrological response?"

Is really Younis et al. 2008 the best reference for the statement? Didn't we know this before 2008? As a general suggestion it is a good practice to use "e.g." before listing references that represent a much larger group of papers on the subject. This way the authors of the papers not included "feel" better. . .

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P116, line11. I don't understand the sentence: "A daily spatial adjustment was combined with an hourly mean-field bias adjustment." What is the difference between "spatial" and "mean-field"?

Are daily data sufficient for the analysis?

The frequency analysis. The authors should tighten up the precision of the language they use. While the analysis is admittedly cursory, it is based on some strong (and unverified) assumptions. For example, time and space statistical stationarity, spatial independence, adequacy of the bootstrap methodology for uncertainty analysis, etc. I also object to the use of the term "recurrence period." Why not simply the probability of exceedence and the associated quantiles? Why is this analysis relevant to the "near future" (page 122, line 6)? Also, could you specify the condition of your calculations of 2% chance (line 24)?

Discharge accuracy. Could you insert a photo of the H-flume (perhaps take during normal i.e. low flow conditions) in figure 10?

I hope that Figure 9 will not be broken up across pages in the final version of the paper. You don't need to repeat "Aug 2010" on each label. A couple of labels and an appropriate choice of ticks would improve the clarity of the figure. You could include subtle vertical shading to delineate days.

Conclusions.

Much of the text there reads like a summary not conclusions. Is the division of the response into the four phases a conclusion from the study or merely authors' choice to organize the discussion this way? Does this case study confirm our understanding of small watersheds response or have we learned something new here? If so, what? Any discussion of the implications for modeling? Real-time forecasting?

Overall the paper documents a nice study that with a little more works could become a frequently cited reference for flash floods in the region.

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