

## ***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 #3**

Received and published: 1 March 2011

The authors present a nice case study on an well-observed extra-ordinary flood event in the Netherlands. Even though it describes in much detail a specific event, it is of general interest as observed processes are very helpful for perceptual runoff model building in lowland catchments. I find little wrong with the paper, except for some minor issues:

- The title focuses on one partial conclusion that is not the main message of the paper. In fact such a title would fit better with a research letter, and not a full paper with a detailed analysis of a flood event. I would propose as title: “Anatomy of an exceptional lowland flash flood”.

- I am not sure whether according to the definition used on page 114, line 20 this flood constitutes a flash flood. The actual response only occurs after 8 hours when the soil is

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saturated, which is longer than a few hours. On the other hand, when comparing with the description of Marechal et al (2009), it apparently is a flash flood. Which definition is valid here?

- Section 2.4: discharge regime: it would be informative to produce a figure showing one subfigures with past extremes (rainfall and hydrographs) including the last one on the same scale: e.g. the five largest events with 5 figures in a column. This to compare the different response with similar rainfall and so stress the importance of initial conditions.

- The microwave link data do not add much to the overall analysis. It shows that they are similar to calibrated radar; so what? It seems that they have been added only to show the group's observational prowess. I advice to leave these out.

- I believe that not attempting to provide a return period from the 41 years of discharge data on account of the number of years being too small is an omission. I would state the problem of limited data, but still fit a GEV to them and then provide confidence intervals of return periods using e.g. a bootstrapping technique. It is important to provide at least a tentative quantification of return period, this to support the conclusion that although the rainfall event was exceptional, the discharge event was less so due to soil moisture buffering.

- Flood synthesis: I would denote the stages (1) to (4) in Figure 11 and Figure 9. If these stages are not distinct in time due to spatial variation, they can be denoted by overlapping bars. Without this, it is difficult to support the analysis of the flood anatomy provided in section 5.

- Would it be possible to provide an estimate how much larger the flood would have been if the rainfall occurred with a soil already close to saturation?

Details:

- Abstract line 178: should be 5 l/s.

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- Page 116 , line 26: is “global radiation” a standard term? Otherwise use “incoming short wave radiation”.

- Page 116, Line 7: change to “The Hupsel brook is of natural origin,”

- Page 120, line 14: “A less official . . .measured”. Leave out: if it is not observed officially, then it cannot be verified. It would only provide confusion to leave it in.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 111, 2011.

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