

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 #4

Received and published: 4 March 2011

The paper is a nice contribution to the extreme floods literature. It reflects the view that major floods are important subjects of study and that modern experimental methods should be brought to bear (along with time-tested methods) to study the diverse physical processes at play in determining magnitude and frequency of extreme floods. The observational methods are clearly documented and provide a unique record of extreme flooding in small lowland watersheds. Some of the most interesting features of the observations concern the timing of soil saturation and runoff production. Analyses and interpretation of these features would benefit from additional work (as discussed in more detail below). The paper is recommended for publication following revisions to address the issues raised below.

The real action in Figure 9 takes place during the time period marked by the gray

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shading (roughly 26-27 August), but it only occupies a small portion of the total space. Figure 9 is also the money plot of the paper. It represents a combination of rainfall, subsurface and stream gaging observations that are not available for many other floods of comparable return interval. If Fig. 9 is retained (the photos are nice, but of secondary importance to the 26-27 August observations), then a companion figure needs to be added that provides a blowup of rainfall, soil moisture, groundwater and discharge observations for this key period. The observations suggest near surface saturation and runoff production occurs well before column saturation, but these features are not adequately detailed in the event synthesis. The discharge hydrograph shows that the basin is responding before the groundwater level reaches the surface. Agricultural drains? Hortonian runoff? Discussion of the hydrologic response should address the critical period in greater detail.

The discussion of rainfall return interval is presented with caveats, but it's still a bit disconcerting to see a focus on return intervals of 6000 years. Additional softening of the treatment, focusing on the conclusion that a solid case can be made for return interval in excess of 1000 years, would provide a more compelling representation of results. Figure 10 is not essential to the paper and could be removed.

Awkward phrasing to be revised:

“The meandering brook has been straightened before the start of the observations (and parts are being restored since 2007)”

Section 2.4 Discharge regime-“in the last decade of August”-

Section 2.4 2nd paragraph “(and most likely also initial storage)”

Section 3.1 last sentence “rainfall got a more stratiform character” wording is awkward

Section 3.4 first sentence “the question remains how extreme this event really was”

Minor edits:

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The last sentence of section 1: Introduction is missing a period.

In section 2, M.A.S.L . instead of m+MSL

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

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