

## ***Interactive comment on “Temporal dynamics of hydrological threshold events” by G. S. McGrath et al.***

### **Anonymous Referee #1**

Received and published: 1 November 2006

This paper attempts to quantify the temporal dynamics of runoff processes in terms of rainfall and climate properties. The temporal dynamics of runoff events occurring as a result of either a rainfall intensity threshold or a soil moisture threshold being exceeded was analysed. In general, this paper describes a new and relatively original piece of work. However, despite the fact that I have been a professional hydrologist for the past 10 years, I found this paper very difficult to follow. In particular, the mathematical equations and related statistics given in this paper are way beyond my understanding. As a result, I am unsure whether the results and subsequent conclusions of this study are actually correct. This paper may require a more qualified referee to review the mathematical components of this study. Nevertheless, I felt that much of the paper

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could be better written, particularly the introduction and conclusion sections. These sections contain far too much hydrological and mathematical jargon for many scientists outside this specific field to understand (for example, refer to the opening paragraph of the introduction). I also think the introduction should clearly indicate why this study is so important and the basic implications for better understanding temporal dynamics of runoff processes.

Other general comments include: (1) There are too many mathematical symbols used. For example, I am unsure why there are two separate symbols for storm depth and mean storm depth (similarly for maximum storm intensity and mean maximum storm intensity). A simpler way of expressing the mean of a parameter is the 'bar' over the top of the parameter symbol, as you have written for inter-storm duration.

(2) When referring to multiple references within the text, they should appear from oldest to most recently published.

Some specific comments:

P4 (last paragraph) - the first use of 'pdf' needs to be defined.

P6 (equation 1) - what is 'x'?

P6 (section 3, first paragraph) - "In contrast, when the soil" should perhaps read "Similarly, when the soil"

P7 - the equations and corresponding descriptions for variance, coefficient of variation etc are probably unnecessary given that these are relatively standard mathematical terms.

P8 (section 4, first paragraph) - "It may actually represent well more extreme" should read "It may actually better represent more extreme"

P9 (section 5, first paragraph) - "Milly used this model" should read "Milly (1993) used this model"

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P12 - equations for p and q do not have corresponding equation numbers.

P21 (section 6.2.2, first paragraph) - “particularly in semi-arid and arid ecosystems” should be deleted as it has already been said earlier in the sentence.

P22-23 - heading 6.3.1 may be unnecessary given that it is almost identical to the heading for 6.3.

P41 (figure 1) - The figure caption could be shortened by adding ‘l<sub>max</sub> trigger level’ and ‘storage trigger level’ to fig1a and fig1b respectively.

P42 (figure 2) - The zero on fig2a has been cut at the top and the x-axis caption needs to be fixed on fig2b.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 3, 2853, 2006.

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