

Interactive comment on “A Bayesian decision approach to rainfall thresholds based flood warning” by M. L. V. Martina et al.

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This paper was a pleasure to read. It deals with the vexing problem of Flash Flood Forecasting/Guidance in a pragmatic, sensible, efficient and ingenious framework. Admittedly the methodology is still in proposal stage and has only been tested in simulation mode, but it is clear that the authors have a good road-map of where they are going.

Essentially, the procedure is to generate long sequences of simulated rainfall input to a calibrated rainfall runoff model and record the following variables:

(i) Total rainfall depth $V(T)$ since the onset of a rainfall event T ; (ii) Soil moisture stored in the catchment at the onset of the storm, classified into three groups AMC1, 2 & 3 (not to be confused with the SCS classification) (iii) Peak flow/depth at a critical river section

in the resultant runoff.

The peak runoff and causative rainfall depth are grouped conditional on the AMC class associated with the event and their joint probability distribution density functions computed using Normal Quantile Transforms.

All this is done off-line and summarized in a pair of diagrams. These theoretically allow the practitioner to use the AMC and the forecast rainfall associated with a catchment to decide whether to issue a flood warning. This is a neat set of ideas, not all of them new, but put together very usefully.

There is very little that I can do (except make the following two comments) to suggest improvement to the paper which is very well structured; I look forward to its sequel.

page 8 In figure 3, T_c is defined strangely as the time between cessation of each of the rainfall & runoff events. I would have thought that the time from peak rainfall to peak runoff would have done the trick - it's a reasonable approximation to the time between centroids ...

page 10 It is only when one reaches the latter part of the paper that one understands that the cost utility function is used to determine an appropriate length of rainfall accumulation time, T . On this page and on page 11, the discussion does not explain the need for the dependence of U in equation (1) on T . This is confounded by the reference to figure 6 which shows the dependence of U on V , without reference to T . The reader should be helped here to stop the confusion.

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