

Interactive comment on “HESS Opinions “Classification of hydrological models for flood management”” by E. J. Plate

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Received and published: 8 July 2009

This paper provides a basic introduction into rainfall runoff models in a flood context. When first reading the abstract I was excited by the author's view on the importance of representing local conditions well (see e.g. Blöschl, 2009) but when reading through the paper I was a little disappointed. Most of the material seems to be taken straight out of an introductory hydrology course. The material is useful for a novice as it nicely organises the approaches to flood modelling but I'm not sure how much it offers to the HESS readership. Neither is it a review as it neglects some of the more interesting and timely aspects of flood forecasting such as ensemble forecasts and data assimilation. Similarly, new trends in flood estimation (such as the concept of flood frequency

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hydrology) are missing.

There are some elements of opinion with which I strongly agree such as the importance of fully dealing with residual risk and the focus on local conditions. I do not, however, fully agree with the statement on forecast models "that any method which is reasonable and yields acceptable results may be used" (p. 4692). I believe that model structure does matter, in particular, if the forecast situation differs from those in the calibration data set, for example unusual rain patterns or unusual contributions of snow melt to floods. Eq. (6) proposes a performance measure of forecasts but I would think that, from a practical perspective (both economic and political), it is essential whether warning levels are correctly forecasted or not, which is not accounted for in Eq. (6). I would also challenge the statement that "Flood forecast models require higher accuracy than planning models." The difference is that the former are usually deterministic statements while the latter are (pseudo) probabilistic statements. In a planning context, model accuracy will have enormous economic implications when estimating crest heights of levees, for example.

I found the discussion on flood risk management very useful, although, in a number of sections I was unsure whether the author reviewed the state of the practice (what people do) or whether he stated his opinion on what should be done (eg. is calculated, is initiated versus must be determined). Some actions are indeed state of the practice in many countries (such as performing flood forecasts) while others remain wishful thinking (such as comprehensively dealing with residual risk). It would help to clearly separate the two and first say what the state of practice is (which will obviously differ by the region) and then go on to say what should be done. Avoiding excessive use of passive voice would also help to clarify the train of thought.

On a more minor note, on p. 4672 it was unclear to me what is a "Water Resources Directive". The intention was probably to refer to the Directive 2007/60/EC of the European Parliament and of the Council of 23 October 2007 on the assessment and management of flood risks, loosely referred to as the Flood Directive. For the envis-

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aged readership of novices I think that clear terminology is particularly important and I would suggest to replace "recurrence interval of an event" (e.g. pp. 4690 and 4692) by "recurrence interval of a flood peak" as, obviously, it is the peak that is associated with the recurrence interval.

References

Blöschl, G. (2008) Flood warning - on the value of local information. *International Journal of River Basin Management*, 6 (1), pp. 41-50.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 4671, 2009.