

Interactive comment on “Scale effects on runoff generation in meso-scale and large-scale sub-basins in the Luanhe River Basin” by P. Feng and J. Z. Li

Anonymous Referee #1

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The article treats the topic of scale effects on surface runoff in a catchment and a series of sub-catchments. As the authors point out, this is an important topic but the treatment of the data and theory are not well worked out. This is a pity because, especially at the level of larger watersheds, not much work has been done.

Major comments

Two points:

1) The claim is that there is a clear decrease in RO coefficient with increasing watershed size. The exponentially(?) declining curve suggests that as well. But looking at

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the dataset, one could also simply see two points on the right with more or less the same RO coeff and four points on the left without any structure.

So the empirical basis is not sufficiently strong, except perhaps for distinguishing between the two largest and the four smallest.

2) The connection that is sought with field-scale experiments is not very fortunate. Clearly, in a watershed of 6000 square kilometers, runoff is not sheet flow, with which some of the mentioned causes can be associated. Even at the level of the smallest basin, water will have collected in streams or gullies. So something must happen within the channel network (wetlands?) or there is something with the temporal dynamics of the routing of the peakflows (or yet something else, of course).

Suggestion for further work: Perhaps the most interesting lead is the spatial variability in rainfall, but this would need to be worked out rigorously. Where did the rain fall? How would that route to, and between, outlets?

Minor comments:

- How were the 12 (14) events selected? Underlying data are not presented/made available.
- The reference to spatial variability as possible cause does not explain a REDUCTION in runoff coefficient in larger watersheds/slopes (see, for example, the quoted Julien&Moglen).
- Number/name basins in figures as well (there are only a few points)
- Response time variations are treated under spatial variability but these should fall under temporal dynamics.

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