

***Interactive comment on “Effects of rating-curve uncertainty on probabilistic flood mapping” by A. Domeneghetti et al.***

**Anonymous Referee #1**

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The authors present a study on the effects of different sources of uncertainty on probabilistic flood mapping. In general, the paper is very well written and follows a clear structure.

I think this paper is well within scope of HESS and deserves publication after revising some concerns I highlighted below:

- Already in the abstract the authors highlight that this paper treats more than just one source of uncertainty; however in the title of the paper it seems to me that only one source is clearly stated (rating curve), therefore I'd suggest a change in title that reflects the fact that the paper deals with several sources of uncertainties.

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- P9812, L6: I don't necessarily agree with the space stationarity here, especially as the authors highlight roughness. In most models (especially 2D models), roughness can be fully distributed spatially as shown by many studies. As shown by some studies, values for these distributions can even be obtained from the field or other means. I'd say the main reason why people choose a uniform value is not because the model assumes stationarity but rather because models are often insensitive to spatial distributions, mainly because of their underlying simplifications in physics.

- P9814, L19: I feel some more information on this IHAM modeling framework is needed here

- The modeling and the flood scenario generation look sound to me. Most of the models and generation of distributions have been employed on the same or different river system by the authors before

- In my opinion, the results section is relatively short compared to the discussion section, please consider moving some of the text in the discussion section to the result section

- P.9824, last paragraph: some of these results are to be expected (e.g. utilization of a rating-curve constructed using a traditional approach results in a significant underestimation of flooding probability). Some of this text could be moved to the result section and I think the discussion section should have a part that highlight why an uncertainty approach as presented here should be preferred over more commonly adopted uncertainty procedures or indeed deterministic approaches. Most of this is clearly stated at the beginning of the conclusion but I think it should be moved to the discussion section

- P.9829, L 12 Please consider replacing 'dangerous'. Maybe use 'inappropriate' or 'misleading' instead

- Figures are generally of very good quality but Fig. 10 is not very clear, maybe use line shading instead. Also, in the figure caption, please put '...for flood probabilities within

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lower quartile (0-0.25).'

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Interactive comment on *Hydrol. Earth Syst. Sci. Discuss.*, 9, 9809, 2012.

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