

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

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Received and published: 6 November 2012

We thankfully acknowledge the first anonymous Referee (Referee#1) for its positive and meaningful revision; suggestions and comments provided in his revision will help us to improve the overall quality of our work.

Our reply is structured as follows, we report all referee's comments (indicated by RC) together with our reply (denoted by AC, Authors' Comment).

RC: 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

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reflects the fact that the paper deals with several sources of uncertainties.

AR: The Referee#1 is right, the actual title of the manuscript does not completely reflect the evaluated sources of uncertainty. We will revise the title of the manuscript according to this comment.

RC: 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.

AR: We completely agree with the comment of the Referee. The sentence was badly structured and the meaning does not reflect our intention, which was to underline how typical approaches are based on the application of calibrated models that, calibrated over a specific event, are then considered suitable for a range of flood events which could be very different compare to the one used for calibration using the same parameters set. In the revised version we will clarify this point.

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

AR: We will extend the IHAM description in the revised version.

RC: 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

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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.

AR: Good point, we approve suggestions of the Referee#1. Results, Discussions and Conclusion sections will be reorganized in the revised version following his recommendations.

RC: 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 lower quartile (0-0.25).'

AR: All specific comments will be recognized in the final version.

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