Hydrology and
Earth System
Sciences
Discussions

Interactive comment on "Reproducing an extreme flood with uncertain post-event information" *by* Diana Fuentes-Andino et al.

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We are grateful to Ilja America for reviewing our manuscript, for summarising our work and for her valuable comments which will greatly help us improve our manuscript.

Response to Major arguments

Hypothesis:

-We agree with reviewer that the hypothesis can be better formulated to make it clearer. We will consider the reviewer's suggestion. Thanks.

Model evaluationïijŽ

-Thanks for the reviewer suggestions on Liu et al. (2016) and other flood hazard assessment methods that can be interesting to try. In our work we wanted to explore the

possibilities to use post-event data, a combination of models and uncertainty analysis to assess flood modelling in data scarce areas, we are sure that there are many other approaches that are worth testing. We will discuss this issue in the revision.

We are aware of the shortcoming regarding validation, the proposed methodology can be seen as a learning strategy, part of the Bayesian concept, new data, including post–event, can be used to update the identified parameters. We will discuss this issue in the revision.

Uncertainty:

-We will improve the text in our manuscript by adding and clarifying better some of the points raised in the comments: -Extend on the discussion of the uncertainties associated with the data (see for more detail in the Major_revisions in the supplementary documents).

-Regarding point 1 on comparability between the different post-event data, the reviewer can refer to point 2 and 3 in answer provided in the answer to reviewer 1.

-Regarding point 2, on the number of parameters used, refer to point 5 provided in the answer to reviewer 1 and point 1 in the Major_revisions.docx.

Minor arguments:

-All the minor arguments will be considered by clarifying and or correcting into the new version of the manuscript.

-In response to the comment: "The TOPMODEL parameter sets from Grande and Chiquito River sub-catchments were used to simulate the hydrographs at Salada creek and Las Lomas creek subcatchments (P11, L10-13). The reason for this is missing". Drainage areas of points 8 and 9 are large enough so the inflow have to be considered for the upstream boundary conditions. However, there were no stage records available for those points and the hydrograph were estimated using behavioural parameter from neighbouring catchments P8 L28-30, those areas were smaller compared to the rest

of contributing area (at points 1, 2 and 5) (at points 1, 2 and 5) that it was expected not to greatly impact the results, which was the case (p13 L30-33 and P14 L1-3). We will make this clearer in the revised version.

Minor issues:

-Minor issues, regarding the comment on the abstract, the role of the rainfall, JICA Report, improvements in Figure 11 will be incorporated into the new version of the manuscript. More specific points:

-In response to the comment: "Fig 3 : The figure is not very valuable for understanding the story. Therefore it is not needed": Figure 3 shows the peak in the rainfall so as to compare it with the resulting peak in the propagated hydrograph, showing thus the importance of rainfall in driving the models p14 L 15-20.

-In response to the comment: "P35, Fig 11 : The figure is very unambiguously. If there is a likelihood of inundations than this likelihood is mainly 0.8-1. This is very peculiar": Likelihoods at Fig. 11, varied from 0 to 1 because the global score for all behavioural sets were scaled by a constant C, to sum one (Beven, 2009) (P7 L15-17).

The reviewer can also refer to the supplementary document "Major_ revision", specifically points 1, 3, 4, 8 and 9 address some of the points raised by the reviewer.

References

Beven, K. J.: Environmental Modelling: An Uncertain Future? An introduction to techniques for uncertainty estimation in environmental prediction, Routledge: London., 2009. Liu, R., Chen, Y., Wu, J., Gao, L., Barrett, D., Xu, T., Li, L., Huang, C. and Yu, J.: Assessing spatial likelihood of flooding hazard using naïve Bayes and GIS: a case study in Bowen Basin, Australia, Stoch. Environ. Res. Risk Assess., 30(6), 1575–1590, doi:10.1007/s00477-015-1198-y, 2016.

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