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Interactive comment on "A 2-D hydro-morphodynamic modelling approach for predicting suspended sediment propagation and related heavy metal contamination in floodplain: a sensitivity analysis" *by* R. Hostache et al.

Anonymous Referee #1

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Review of the paper A 2-D hydro-morphodynamic modelling approach for predicting suspended sediment propagation and related heavy metal contamination in floodplain: a sensitivity analysis By R. Hostache et al. MS No.: hess-2013-617 The paper studies the deposition of fine sediments in floodplains and performs a sensitivity analysis of different model parameters for the hydraulic and morphologic model part. A 2D-model was applied to two flood events in an about 2km^2 floodplain. The results of the modeling exercise were compared to measurements of dissolved concentrations of three trace metals and to concentrations in the upper soil (0-5cm). 1.Does the paper address

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relevant scientific questions within the scope of HESS?

- Yes. The distribution of fine sediments with associated pollutants in floodplains is from great scientific interest and tools should be developed to forecast the erosion, transport and deposition of particle bound pollutants.

2.Does the paper present novel concepts, ideas, tools, or data? - There are not so many papers that describe in a proper way a combined sensitivity analysis (SA) of hydraulic and morphologic model parameters. So I expected from the heading and abstract that there would be such a combined SA but there wasn't for different reasons given later by the authors. The reason is mainly the computational effort. There were no information if a parallel code was used what is possible with Telemac. - The concept (SA), idea (SA for hydraulic model and later for morphologic model) is not new. The tools for using TELEMAC/Sysiphe in Monte Carlo analysis were surely new developments but they were programmed for internal use. The Telemac/ Sysiphe system itself was not developed further. The data are very interesting, it is a good data set that deserved to be published with the proper model exercise. - Using spatial distributed friction coefficients is quite difficult – it was stated from references from 2005, 2010 – so it would be a progress to present some new things in this direction, but unfortunately it wasn't. - The new thing is the comparison of the spatial distributed soil samples to the deposition rates. But the comparison exercise should be improved or at least more discussed/assessed. - There is the general question, if the spatial and temporal high heterogeneous behavior of fine sediment flakes can be really described with a simple sedimentation model like that one used in Sysiphe?

3.Are substantial conclusions reached? - The authors stated that the "innovative point in this study is the rather unique measurement database". That's true and I can imagine the effort behind it. - The conclusions drawn regarding the SA could be expected and are known - The qualitative comparison between calculated deposition and upper soil concentrations looks quite interesting

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4.Are the scientific methods and assumptions valid and clearly outlined? - In general yes - The hydraulic and sediment transport model is standard and the Telemac/Sysiphe documentation is available - The authors stated that the number of points in the parameter space for the SA "might be sufficient for capturing parameter sensitivity". That should be explained a little bit more. Because from the literature (Beven, Saltelli) there is a clear advice to use large number of samples. The argument of high amount of computation time can't be used in this point. Than the used method is not adequate.

5. Are the results sufficient to support the interpretations and conclusions? - Yes. 6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)?

- In general, Yes. The procedure how the samples were extracted from parameter space, could be explained in a little more detail. 7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? - Yes. 8. Does the title clearly reflect the contents of the paper? - Yes. 9. Does the abstract provide a concise and complete summary? âẮ Yes 10. Is the overall presentation well structured and clear? - In general, yes. I suggest some parts from results and discussions to move to the material and methods section. 11. Is the language fluent and precise? - Yes. 12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes.

13.Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? - Yes. I give my suggestions as comments in the PDF. 14. Are the number and quality of references appropriate? - There is one reference from 2013, all other are 2010 and older. I wonder if there are some more newer references regarding to the topic. Is there only one important reference in the last four years? Please check again. 15. Is the amount and quality of supplementary material appropriate? - There was no supplementary material given Further remarks and suggestions are given as comments in the PDF.

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Please also note the supplement to this comment:
http://www.hydrol-earth-syst-sci-discuss.net/11/C814/2014/hessd-11-C814-2014-supplement.pdf

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