Author's response to the Associate Editor's comment

We really appreciate the time and effort you have dedicated to providing insightful feedback on ways to strengthen our paper. We have a full and thorough understanding of the points raised by the Associate Editor.

We added the section 3 that reproduces the hydraulic experiments to study the characteristics and test the validity of the proposed method. Though the option to move the entire field case study to a future publication was suggested, we remain the part in section 4. This is because our goal is to use the proposed method to assess, predict, and mitigate potential sediment and flood hazards in the filed rivers. Also, the results of the field study, such as Figure 14, raise the discussion for the importance of flow reproduction and associated sediment deposition in the 2-D model, so to obtain a reasonable result for large wood deposition in this model, it is necessary to use a sufficiently fine mesh when computing a 2-D flow model that can reproduce, for example, an eddy separated from a main flow.

Based on these calculations in Sections 3 and 4, Section 5, the discussion section, has also been completely rewritten, following the suggestions of (i) a critical assessment of the model's main assumptions, and (ii) a comparison with previous modeling attempts. Corresponding to the revisions in the Discussion section, the Introduction, or Section 1, clearly presents the position of these calculations, and the Conclusion, or Section 6, adds the conclusions from these additional investigations. The Abstract has also been modified to reflect these changes. We hope that this revision will address the points raised by the two reviewers and the Associate editor and move the manuscript forward for publication.

Best wishes,
Daisuke Harada and Shinji Egashira

Associate Editor's comment

thanks for the manuscript and your edits and rebuttal. I have looked through the reviews and your response and have decided to return the paper to you for some more revisions before sending it out for review again. Reviewer #2, in particular, has raised some serious concerns, which I do not think you have fully addressed yet. Reviewer #2 makes four major points, each of which seems justified and fair to me. The rebuttal, at the moment, presents some general arguments that only partially address the reviewer's concerns.

I do not think the concerns are fatal for the paper. Rather, my impression is that the specific objectives of the paper and of the comparison to the case study are not well communicated at the moment. I agree that the model description lacks some details and that it is unclear how it differs from / advances over previous attempts. Further, I agree with reviewer #2 that the data and the way you use it at the moment to not provide a convincing validation of the model. In general, the purpose of the field study is unclear. Yet, I also think that a validation is not entirely necessary for the paper to make a valuable contribution. Instead, you could treat the case study as an example application.

There are some other parts where I think the paper needs some development. In particular, the discussion is rather short at the moment.

So, here is what I suggest:
- clearly state at the end of the introduction as to what the objectives with the field data comparison are
- expand and sub-structure the discussion, to include sections (i) with a critical assessment of the model's main assumptions, and (ii) a comparison to previous modelling attempts. In the latter, please highlight where you see the advances, advantages and disadvantages of your formulation. I suggest to move the discussion of the case study into a separate sub-heading. You could also expand the last paragraph to include model requirements (what type of data is needed? What are limits in terms of catchment size and stream morphology?), and give some more information on the type of applications you envisage your model to be suitable for.
- for the field study, try to better work out the take-home messages for the reader. At the moment, the discussion merely contains a few statements on the water levels, the flow velocity, and the spatial distribution of wood. As a reader, I am not really sure what the purpose of these bits of information are and what I should learn about the model from it.
- it may help the readers and potential users to understand your model if you simulate and present some simpler instructive 'ideal' cases or numerical experiments in addition to the complex field case of the Akatani basin. For example, a straight river with a bridge, or a river bend, combined with a small parameter study varying wood load, peak discharge, etc. Given that you state in the rebuttal that concerning "the lack of statistical discussion, that is what we need to pursue in the future" - maybe it would be an option to move the entire field case study to a future publication, and focus in this paper on the model behavior using a number of suitable numerical experiments.

I hope this helps and I am looking forward to seeing your revised paper. Please get back to me

if you need further clarification.

With best wishes, Jens Turowski
Handling AE

Typos and notes
65 The basin had not experienced⋯
207 ⋯within the 3.5 km reach⋯
208 plesae give some more details (at least grid size)
209 ⋯is set to⋯
210 please include details of the calibration procedure
210 how was the sediment size distribution determined?
260 rectangle
262 reproduced
264 reproducability