Earth Surf. Dynam. Discuss.,
https://doi.org/10.5194/esurf-2017-46-RC2, 2017
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Earth Surface Dynamics Discussions
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Interactive comment on "Alluvial cover controlling the width, slope and sinuosity of bedrock channels" *by* Jens Martin Turowski

Anonymous Referee #2

Received and published: 22 November 2017

The paper "Alluvial cover controlling the width, slope and sinuosity of bedrock channels" presents a model that incorporates sediment-flux driven bedrock erosion, and scaling of bedrock river channels' physical features to describe sinuosity at a steady state value and predict the observed relations between sinuosity, erodibility and storm frequency. The paper, the model, and the supportive arguments were well-constructed and clearly explained, making this an interesting and enjoyable paper to read. The paper references previous work in a manner that allows the reader a clear understanding of the basis for the model. Further, the novelty of the model presented is based on a solid foundation of previous work and sound logic. The methodology and assumptions are clearly outlined. Further, to my knowledge, the model presented is completely novel. I believe this will be a substantial contribute to the journal, and fits well within

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Discussion paper

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the journal's scope, and the field at large.

Overall, I would rate the scientific significance and scientific quality of the paper as excellent. However, the presentation quality would benefit from additional graphical depictions of the model, and possibly the scaling data also. While the author has done a nice job of clearly taking the reader through the calculations of the model, I believe readers' understanding of the model and relationships described could be improved from additional depictions.

Additionally, I have the following minor notes on the rest of the text: âĂć The "Tools-dominated" vs "Cover-dominated" could use a little more initial introduction to full appreciate the meaning and differences. The author discusses this a bit just after Table 1. However, it is difficult to relate how these equations differ relative to reality. While the author does describe the typical environments these two types of equations would apply to at the end of section 3, why these tools apply here could use more development. âĂć The conclusions are concisely written; however, they may benefit from further development. I felt that additional development of the last paragraph of the paper in particular could benefit from additional development. While the paper does layout the novelty of the work, as the paper currently stands it doesn't sell the novelty and usefulness of what's been produced as well as it could. âĂć I would reconsider the title or placement of section 4.4. The title doesn't seem to express what the author is saying. This paragraph could also be adjusted to be part of the conclusion. As it currently reads it seems a slightly out of place. âĂć A minor error includes a few of the variables are undefined this the text (for example, Qt). Additionally, some of the variables (Scover, Stools, Ccover, Ctools, σcover, and σtools) are not listed in the notation list. Finally, the notation list is also slightly out of order.

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