

Interactive comment on “A segmentation approach for the reproducible extraction and quantification of knickpoints from river long profiles” by Boris Gailleton et al.

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We thank reviewer 3 for their review of our manuscript. Below we list reviewer comments in italic font and our responses in regular font.

This work presents an improved approach for the extraction and quantification of knickpoints from river long profiles. The work is well written and clear in its goals.

Thanks.

Having said that, in my opinion, there are two major issues to fix before getting

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it published: (1) the format of the publication that at my eyes is a technical note, not a full paper; (2) representativeness of study area considered in this study and its application in complex geomorphology landscapes.

(1) In the hands of the Esurf editor the decision, but at my eyes, this paper, mainly focused on an improved method, among others available in the literature, should be structured as a technical note.

We disagree and have made our case in response to reviewer 1. We should also note that ESURF does not include a technical note category.

We repeat an excerpt from our response to reviewer 1:

Providing open-source and documented code is crucial for making our research easily reproducible, testable and improvable. However it also generates a significant risk of mis/over interpretations of its results, as the software would ultimately produce results in any context. We therefore believe that it is crucial to provide such analysis with extended discussion on its use and in comparison to other existing methods, sensitivity analysis on the different parameters, example of uses on different landscapes, and clear statements on how to constrain it. Other scientists who might come to use our methods should be aware of what the algorithms can provide and what the limitations might be. The reviewer suggests that we drop this analysis in the appendix of a case study. However, inadequate discussion of methodology along with failure to publish software is one of our major frustrations. We do not agree with the suggestion that we follow this approach. The reviewer then suggests we just publish an overview of the general software. This again we feel would be a major disservice to users of our methods since such a paper could never go into the details of each method; the development and testing of each method typically represents many months of effort, not to mention the many years of CPU time we devote to testing on multiple landscapes. We strongly feel that our approach of publishing the details of the method and our efforts

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to fully explore its capability are the most beneficial for the geomorphology community.

(2) I'm not sure, but are the study areas presented, enough to guarantee a robust analysis of the capability of the given method to work objectively in different landscape contexts, and complex morphological conditions? The impression (but maybe I'm wrong) is that the landscape morphology of those areas is quite gentle...

We do not know how the reviewer got the impression that the landscapes are quite gentle, given that the Santa Cruz site has an overall channel slope approaching 0.1 (see Figure 7 in the discussion paper) and the Brazilian site has numerous waterfalls and knickzones that exceed 40 metres (see Figure 8 in the discussion paper). We have tested the method in many sites: there is not enough room to add all of them to the paper but we will add more locations in the supplemental materials.

The Santa Cruz site features a range of bedrock types, tectonic forcings, and variable sea level. The Brazilian site features lithologic heterogeneity and its tectonic history is contested. We have noted these features in Sections 3.1 and 3.2 of the discussion paper. We are surprised the reviewer does not consider sites with lithologic, tectonic and base level heterogeneity in both space and time to be complex.

For other points, I'm generally in line with the feedback provided by reviewer 1.

We have responded to reviewer 1 and refer readers to that response.

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