Authors' Response to Reviews of

"Continuous measurements of valley floor width in mountainous landscapes"

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ESURF,

RC: *Reviewers' Comment*,   AR: Authors' Response,   ☐ Manuscript Text

Dear Wolfgang,

Thank you very much for your careful handling of our paper and your comments. We have responded to each comment below and changed the manuscript accordingly.

Best wishes,

Fiona, Eliot and Simon

1. Associate Editor Comments

RC: *I am quite pleased to see a paper that deviates from the standard heading-scheme: Introduction, Methods, etc. , although this makes it a bit harder to quickly navigate the manuscript at first sight. However, in the guidelines (https://www.earth-surface-dynamics.net/submission.htmlmanuscriptcomposition) we ask our authors to provide sections titled Introduction and Conclusions. While you have the former, I need to ask you to rename the last section to Conclusions.*

AR: We have renamed this section to Conclusions.

RC: *369: Really, the D8 flow routed channel was already and always in the valley centre? This is actually hard to believe looking at e.g. the Cumberland River and how it freely meanders in a relatively wide floodplain.*

AR: We have changed the wording in the text to make this clearer: although there are still some discrepancies between the channel and the valley centreline from the 30m data, we found that generally the D8 flow routing does not lead to overestimation of valley width from 30 m data as the flow paths are smoother than from the higher resolution data. We have amended the sentence in the text:

> Due to the coarser resolution, extracting a valley centreline was not necessary as the D8 flow routed channel was sufficiently smooth to avoid overestimation of valley floor width at meander bends.

RC: *Fig. 12: All regression lines should have confidence bounds associated with them. These could be bootstrapped if autocorrelation in valley floor width is a problem. It will be interesting, however, whether any significant changes between the different creeks can be observed once you account for the uncertainties of the fits.*

AR: We have added bootstrapped confidence intervals to each width-area figure (Figs 12, 13, and Fig S1 in the supporting information) as suggested. We bootstrapped the data 1000 times taking a random sample of 50% of the data points in each iteration. We found that these confidence intervals are relatively narrow for each regression, such that it does not affect the results of the analysis as presented in the text.

RC: *394: The units of K_v reported here is strange.*

Thanks for catching this - the correct units are m km$^{-0.6}$ as $c_v = 0.3$ for the Appalachian Plateau rivers. We have updated this in the text.