

Response to review by Editor

Dear Dr. Langer,

We are pleased that you see no major obstacles to publication and that you provide feedback for us to respond to. Please find our responses below in blue.

Editor Decision: Publish subject to minor revisions (review by editor) (15 Jul 2021) by Moritz Langer

Comments to the Author:

Dear authors,

Thank you for your careful consideration of the reviewer's comments and suggestions. I conclude that all important issues have been adequately addressed in the revised manuscript, so I see no major obstacle to publication. However, please note the following technical comment and two questions regarding the conclusions from my side:

In section 2.2 and other sections, there seem to be technical problems in compiling the citations.

Yes, I had difficulty with some of the references in the mark-up version of our revisions. Instead of taking the time to put the actual citations in those cases, I simply left them as the bibtex label. My apologies for this confusion. This is only an issue in the mark-up version. It can be verified that they are correct in the actual manuscript.

l. 695ff: Would this general statement hold if small and deep polygons had higher flow resistance in their rims?

This is a good question. I assume that you mean if small, deep polygons characteristically had higher flow resistance in their rims than wide, shallow polygons? I suppose that perhaps that could be the case, although I'm not aware of any research indicating that. Given the lack of information regarding flow resistance under rims in general, not to mention differences between small and deep vs wide and shallow polygons, our sensitivity analysis assumes constant flow resistance in their rims.

l698ff: This conclusion seems a bit contradictory to the previous one. It could be expected that small and deep polygons would have a larger fraction of cryoturbated area/volume, while wide and shallow polygons should have a larger area unaffected by ice wedge expansion leading to a more layered stratigraphy. Would it be possible that the two effects cancel each other out in reality?

Yes! Great point! This is the whole point of Figure 10 (and analogously Figure 7 for drainage pattern). We stress in the manuscript that the combination of anisotropy and aspect ratio need to be considered to determine the drainage pattern and timing. To clarify, we have added that

in the former case, we are referring to when anisotropy is held constant and in the latter case when aspect ratio is held constant.

Best regards
Moritz Langer