April 6, 2021

Dear Peter,

Thank you very much for your helpful comments on the paper and we greatly appreciate you recommending this as a highlight paper. The following document indicates how we have implemented the minor revisions that you have suggested. Our track changed documents and PDF versions are attached.

Please let us know if you require further information. We look forward to hearing from you in due course.

Best wishes,

Steve

Author Reply to Editor's Minor Revisions.

Minor track change edits were implemented throughout the text.

P2 L62: Regarding use of renewal: I think renewal does work, however we have followed your suggestion and adjusted this to "rejuvenation" which is also an adjective we have used in the past. There is evidence that throughout the Holocene, and most prominently in the early Holocene, streams have transported lots of post-glacial sediments from slopes into downstream systems. However, thaw-driven processes have certainly been "invigorated" by climate-driven thaw. Adjustment also made on P31 L807.

P7 L176: We moved reference to the nature of biophysical conditions in southern environments to the front of the clause following the sequence presented for low and high Arctic descriptions and we also removed some redundant words. As I understand this follows your suggestion. Regardless, the flow has been improved.

P10 L291: Suggested editorial revision implemented.

Table 1: Suggested editorial revisions implemented.

Figure 2: Suggested editorial revision implemented.

P19 L515: Suggested editorial revision implemented.

P20 L550, 552: Suggested editorial revisions implemented.

Figure 6: Please note that in this figure we are portraying accumulations as a function of disturbance area, not as disturbance count. The impacts to the stream reaches with no apparent dot reveal that disturbance area is very small (less than 1 ha, so very small slide(s) or slump(s)). In this way, the reader

can determine that the reach is impacted but total disturbance area for that stream reach is less than 1 ha. This is explained in the caption.

P23 L582: We have used Figs 6, S3 as examples because Willow River drains into Peel Channel, and in our broad scale accumulation, Peel watershed effects are also routed through Peel Channel. However, we have adjusted text slightly for clarification.

Some of the main Peel River tributaries are increasingly being affected by large slope thermokarst failures and shallow slides “similar to those observed in the Willow River catchment” (Figs. 6, S3).

P23 L593: Source of the compilation is added here (Shakil et al., 2020b).

Note that we have reviewed the manuscript to ensure figure references appropriately match figures. The edits you have provided in track changes throughout the manuscript and supplement have been implemented.

Supplementary materials:

P2 L45-50: “nid” was defined as suggested.

P3 L85-86: Point 10 was simplified to read “In order to ensure the consistency of areal estimates, scar and debris tongue areas were computed using the same projected coordinate system used in Rudy and Kokelj (2020).”

P4 L115: Step 2 was removed and included in the Method 2 introductory paragraph, which is consistent with how this procedural step was addressed in Method 1.

P5 Step 12 and 15, with reference to adjusting color for visual inspection. These sections were integrated and simplified, and reference to particular color scheme was removed.

Figure S1. Caption adjusted.

Figure S3. Photograph date added.

Figure S4iii. Photograph adjusted to provide a different view of the Johnson River slide.

Tables: Minor adjustments implemented.

Videos: hyperlinks and access dates added.