

Editor Morse-

Thank you for the additional review and edits to the manuscript. You caught a lot of small grammar and spelling issues but also provide some suggestions to make the language simpler, shorter, and clearer. All of the suggested edits have been made, however, a few are discussed in detail below as I wanted to provide some additional perspective.

There is some confusion from me about what words to hyphenate or not (ice-rich, top-down, active-layer) as some people do hyphenate them and some do not. I have changed to ice-rich (ice-poor, etc.) and top-down but not active-layer. I see more papers use "active layer" than "active-layer". This includes papers in *The Cryosphere* but I will defer to you or the journal if it is preferred it be hyphenated. I have never hyphenated it in a paper or report or book chapter.

Comments specific to your edits/comments:

Line 22: we are reporting repeat end of season active layer depths. I want to make it clear that unlike a lot of studies that are done in the summer these are truly active layer measurements. I would like to keep them presented as such. I changed the text to:

"Repeat end of summer thaw season active layer depths, near-surface permafrost temperature measurements, electrical resistivity tomography (ERT), deep (>5 m) boreholes, and repeat airborne Light Distance and Ranging (LiDAR) were used to measure top-down permafrost thaw and map thermokarst development at the sites."

We do provide a set of "thaw depths" for the 2014 dataset so we could say "repeat seasonal thaw and end of season active layer depths" but I respectfully request we keep "active layer" in there somewhere.

Line #s in the below are keyed to the line numbers in your edited .pdf.

Line 28: I rarely see "active-layer" with the hyphenation. Please clarify if you want us to present it that way here and throughout the manuscript.

Lines 128-138: I am not clear based on the .pdf formatting what is preferred for the degrees, latitudes, longitudes, etc. The .pdf editing tool is hard to decipher with a lot of edits in a short text string. I tried my best.

Lines 154-165: DSMs are not appropriate here. The data were DEMs, representing bare earth, and those were the surfaces that were differenced. DSMs include bare earth + vegetation, like trees, and those points in canopies were filtered out. DEMs are more powerful for this analysis.

Please also see clarification for the 2010 versus 2020 scales added/edited as requested.

Line 223: I am not clear where these words are used again that they need to be cut/simplified. Do you mean here or in subsequent text? I think you mean here so I edited the text to:

"After a graminoid-dominated trail the ecotype changes to black spruce forest. Farmer's Loop 2 transect shifts from mixed forest to a flow through fen wetland from 120 to 170 m. After a trail crossing at 200 m the ecotype shifts abruptly to tussock tundra until the 400 m mark where a trail crossing separates the tussock tundra from mature black spruce forest."

Line 233: "Numerous trail crossings identified as disturbed locations and a large thermokarst feature near Glenn Creek are also present."

It is suggested to change this to:

"Numerous trail crossings identified as disturbed locations and a large thermokarst feature near Glenn Creek is also present."

I am not the sure "is" is appropriate here.

How about:

"Numerous trail crossings are visible and are identified as disturbed locations and a large thermokarst feature near Glenn Creek is also present."

246-254: again it is more common to see "active layer" than "active-layer" Please advise if you really want this hyphenated.

263: if we are going to change ice rich" to "ice-rich" then should we change "ice poor" to "ice-poor"?

374: It is ok to remove this but it addresses the comment on the length of the summer season increasing.

409: it is the total increase not the average

429: There are taliks at many of these sites and though I agree we cannot be sure taliks are everywhere I request that we make that claim and acknowledge it. The seasonal freeze never goes more than 1.5 or maybe 2 m so in many locations it is clear these are not one-off warm summers or warm winter.

I have added this sentence at the end:

"Since thaw depths increased in 2019 and 2020 it is likely residual thaw layers have increased in thickness and lateral extent. At locations where the thaw front has extended below 1.5 to 2 m it is likely that taliks (unfrozen zones between the bottom of the active layer and the top of the near-surface permafrost table) have formed."

Let me know is this is acceptable.

447-454: ok we can delete this. It was an attempt to provide specific locations of the features but if brevity is sought that can be removed.

