

TC-2022-38\_revision\_SVK

I have reviewed the revised manuscript and the Authors' responses and commend them for robustly addressing comments. Some relatively simple adjustments have improved the manuscript, such as clarifying the spatial scope of the inventory. I note that the Authors have included some additional figures in the main body of the manuscript to better explain methods or support results and interpretations. Reviewers' requests for further detail on methods or interpretations were addressed by some elaboration or additions of text, and by adding material to the Supplement. The revised version explains the inventory methods and workflow better and provides some interpretation of variation in the landform type. The study is straightforward yet represents a good empirically-based contribution to the knowledge of permafrost distribution and periglacial landforms over an important region of northeastern Canada. The data, analyses, and synthesis are sufficiently robust to warrant publication in *The Cryosphere*. I expect the paper will be well cited because of its regional significance, straightforward, and clearly expressed methods, and because it highlights the importance of empirical datasets in understanding the thaw-sensitivity of Arctic Landscapes.

I have a few very minor points for the Authors to consider in preparing their manuscript.

#### Specific points

P3 L69. In the first review, developing hypotheses were suggested to help a reader understand the scientific focus of the paper and to frame the methods and analyses. In the revised version, I don't think that the hypothesis as stated is explicitly tested in the study, so consider either reframing it or stating it more generally as a few objectives that allow a reader to understand the logic behind what is going to be presented and how it will be analyzed. So for example, Objectives were to develop inventory methods to.....; evaluate the distribution of permafrost peatlands to.....; compare the empirical data to model products to .....

While this may be more of a point of style, I think slight improvement and additional information will help better frame a good study and help a reader understand what to expect in the manuscript.

I find the addition of Figure 2 helpful. Is there the possibility of linking an oblique shot to the imagery so that others attempting to map similar features have a point of visual reference?

Pg 16 L297-303. The addition of text describing different forms and their frequency of occurrence has been helpful.

I would suggest adding a reference to Figure 6 on P16 L297-303.

P18. L330-333. Do the Authors think that drainage may contribute to the resilience of permafrost in Labrador peatlands? I am not familiar with the terrain, however, in the poorly-drained Taiga Plains, lateral degradation due to advection contributes to the rapid expansion of collapse scars and basins. I raise this only as a point of interest given that they suggest extremely large thermal offsets.

P18. I don't follow the logic behind vertical ice lens size distribution and grain size. Slight elaboration would be helpful so the physical basis for the statement can be understood without going to Allard and Rousseau, 1999.

Figure 7A-D. Please distinguish the inventoried area.

P21 L403-404. This section reads well and provides a helpful discussion of the inventory's strengths and weaknesses.

Figure S6. Is there a scale unit missing for map A?