

This manuscript presents the first systematic inventory of active subglacial lakes in the Canadian Arctic based on ArcticDEM data from 2011–2021. The authors identify 37 lakes (35 of which are newly reported) and classify them into three categories, including two new types (terminal and partial subglacial lakes). The study provides quantitative estimates of lake area and volume changes, discusses recharge–drainage cycles, and reveals a significant negative correlation between lake activity and regional glacier mass balance. Overall, the paper delivers novel and valuable contributions to our understanding of subglacial hydrology in a rapidly changing region. Therefore, I recommend a minor revision of the paper.

Major Comments

1. The correlation analysis currently compares the annual number of subglacial lake events with the regional total glacier mass balance. While this yields a significant correlation, the choice of metrics may not be the most physically meaningful. Event counts do not capture the volume of water exchanged, and the regional mass balance may not reflect the local conditions of specific lake basins. A more convincing approach would be to compare the cumulative volume change of events (ΔV) with the mass balance or runoff around the lakes?
2. While different regression models and error estimates are applied, potential under-detection of events and biases in water-volume estimates are not sufficiently discussed. I suggest the authors add a brief note in the Discussion or Conclusion to explicitly acknowledge these methodological constraints. In particular, it would be useful to clarify whether the number of DEM acquisitions varies between years, and if so, how this might influence the detection of short-term events and the apparent interannual variability in event counts. A short discussion of this potential bias would strengthen the robustness of the study.

Minor Comments

1. A clearer hierarchical structure would improve readability. In particular, separating the Methods, Data, and Results/Discussion sections more explicitly would help the

reader follow the workflow and findings more easily.

2. The conclusion section restates results but could benefit from one or two sentences highlighting broader scientific implications or future directions, e.g., how satellite missions (ICESat-2, SWOT) might improve detection of similar events.
3. In Figure 2, it would be helpful to indicate the locations corresponding to panels b and d. Currently, only one subglacial lake is shown in the figure; if these panels correspond to a different lake, please clarify this in the caption or text.².
4. In Figure 5, the ICESat-2-aligned ArcticDEM elevations are classified as “good” (purple squares) and “suboptimal” (yellow circles). Could the authors clarify how these categories are defined? Are they based on intrinsic DEM quality, on ICESat-2-to-DEM alignment performance, or some other criterion?
5. Table 1 could be enhanced by indicating which lakes are newly reported to highlight the contribution, or the previous reported lakes can be labelled in Figure 1.