

The Cryosphere Discuss., referee comment RC3  
<https://doi.org/10.5194/tc-2021-311-RC3>, 2022  
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## **Comment on tc-2021-311**

Anonymous Referee #3

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Referee comment on "TermPicks: a century of Greenland glacier terminus data for use in scientific and machine learning applications" by Sophie Goliber et al., The Cryosphere Discuss., <https://doi.org/10.5194/tc-2021-311-RC3>, 2022

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Summary: The authors compiled all publicly-available Greenland marine-terminating outlet glacier positions from a wide variety of authors and performed a rigorous standardization procedure with the aim of creating a terminus trace database that could train machine learning algorithms. A description of qualitative and quantitative differences between the sources is provided, as well as a cursory review of the terminus position data coverage and estimated retreat rates relative to single datasets. The discussion focuses on recommendations for use of these data in machine learning algorithms as well as generation of additional manual terminus trace data using the updated GEEDiT tool (called GEEDiT-TermPicks).

The manuscript is easy to read and documents much-needed work. Although I hope the standardized datasets and the "ideal" approach and output format for the terminus data will advance our field, I am a bit disappointed that this manuscript did not describe any novel insights gained from the combined dataset. I assume that is the topic of another manuscript, but it would have been nice to have this manuscript go a bit beyond a dataset description.

Major Points:

- I'm not a huge fan of the title. I think there are lots of other applications for this dataset and I think it does the dataset a disservice for the title to suggest it can only be beneficial to machine learning applications. Also, there is no demonstration how the dataset improves machine learning applications (although the authors site machine learning manuscripts focused on glacier change). Instead, I recommend something

broader, like “A standardized dataset and workflow for Greenland glacier terminus positions”.

- I appreciate that the results focus on errors and biases for individual traces, but I would also like more information on what the dataset can tell us about changes over time. This does not have to be a Greenland-wide description, but it is important to demonstrate how the combined dataset is much improved over individual datasets. There is one example figure (Figure 8) that is briefly mentioned in the discussion section as an example of the more “complete view of the change” for a glacier. It would be helpful if more examples were given, say as a series of subplots, and that some patterns in retreat rate, magnitude, or timing of changes in those metrics were presented for the broader dataset. Figure 6 gets close to doing this sort of broad overview to demonstrate merit, but doesn’t adequately emphasize the value added by combining the datasets. If these sorts of metrics were presented for some of the contributing datasets as well, I think that information would really emphasize the need for coordination of efforts so that records are detailed in time but also extensive in both space and time. Right now there isn’t anything that demonstrates the broad importance of the dataset you worked hard to create.
- I’m not sure if this should be swapped in as a main figure or added as a supplemental figure, but I’d like to see heat maps or actual maps of the average temporal resolution and coverage for each glacier. You could potentially use different symbol sizes and colors on an actual map to display those data. Right now the focus is on the number of traces for each glacier, which is important for machine learning, but the temporal resolution and coverage is much more important for someone who would want to analyze these data.
- In my opinion, the data formatting section should be below the metadata creation section. You mention scene IDs in the metadata creation but that comes after you already describe how you assigned IDs for datasets that did not contain that bit of metadata.

#### Minor Comments:

- Why is the ID flag 005 but all the other flags begin with X?
- Section 3.3: There needs to be more quantitative substance here. You briefly state that you observe changes in retreat rates. What are the retreat rates? See my major comment about including more of a comparison with the contributing datasets to demonstrate difference