Change Log, v2

Line references refer to the first revisions of the manuscript and may be on new lines in the second revised version.

General Comments

- Reviewer #1 comment: "Regarding temperature: If you decide to go with the observed temperature described in Jensen et al., 2023, could you then provide the reader with information on the distance to the nearest station? And perhaps have some discussion on, that multiple glaciers then are forced with identical temperature timeseries (that's how I understand it: no lapse rate or distance/latitude or proximity to open ocean corrections). I would assume that there could be some differences in the transition to above $0°C$ over larger distances."
    - L129: We add that multiple glaciers are served by the same weather station.
    - Added ", with distances between stations ranging from 16.4 to 309.4 km (Supplementary Information, Table C1)."
    - Added a table to the supplement: GID, Glacier Name, Station Name, distance to station.

- Reviewer #1 comment: "Data density: Seasonality and the new figures in the supplement: You note that the temporal coverage of many observations increases forward in time (e.g. L 79 and L110), and you therefore focus on the period 2000-2020. But even within this period -especially from 2015/16 onwards - it is evident from your figures in the Supplement of ice velocity (and thus strain rate) that the seasonality becomes much more evident. This period also coincides with your test dataset for your model. Figure S9 shows velocity, and the orange line in (b) shows an onset of seasonality after 2016. Does this mean that there was no seasonality in flow of this glacier prior to 2016 or does it show up when the temporal data coverage increases. And how are your results/model influenced by this?"
    - This is true and a good point. We add further discussion regarding the temporal limitations of our data to the section "4.3 Limitations of this Study" as detailed below.
    - L438 in Discussion: "Further, the interpolation method used does not recognize seasonality equally across time series where data density improves with time. This is seen in the time series of strain rate and velocity produced from ITS_LIVE (Supplementary Information, Fig. S7 and Fig. S9), where the addition of Sentinel data increases seasonality in the time series after 2015 (Gardner et al., 2022). This potentially weakens the importance of these features in our results."

Data and Methods

- Reviewer #1 comment: "L299: When you refer to the peak in observed seasonal terminus position annually is this then when it is most retreated or furthest advanced?"
    - Refers to L224. Clarified that we are ", including both the annual high and annual low points."

Discussion

- Reviewer #1 comment: "L457-: "A challenge in interpreting the feature importance results in our methods is displayed by the high feature importance of strain rate along with the low importance of velocity in our Helheimgletscher result (GID 181; see Supplementary Information)." This is more a comment, but are changes in glacier front position not more related to changes in tensile stresses rather than mean velocity?"
    - This depends on what ablation law you are following. While many ablation laws include tensile stress, some do not compute strain rate at all but still use ice flow velocity to compute change in terminus position (ΔL = velocity – ablation). What we are highlighting here is that, when our model is given two related variables, it may rely on just one of these variables while finding low importance to the other.
- L458: Typo. "see" written twice.
    - Removed one "see".

Figures, Tables, & Supplementary Information

- Reviewer #1 comment: "Figure 1: Question Marks in Figure caption."
    - These question marks appear for figure references in the 'Author's tracked changes' file but not in the 'Manuscript' file.

- "Regarding temperature" general comment
    - Supplementary: Added Table C1 to the end of the supplement, which gives the name and distance of each DMI weather station used.