

Responses to the handling editor for Fujita and Kayastha, submitted to TC

Dear Editor,

Thank you for your comments. My answers to each comment are indicated in blue text, with line numbers in the tracked-changes manuscript.

Best regards,
Koji Fujita

Minor comments:

L75: “we confirmed that there was almost no snow ...” Could you be more precise here? For instance, if applicable specifying “successive field surveys in YYYY-YYYY confirmed that ...”

I rephrased here as “the field survey in 2008 confirmed that...”. (L68)

L80: “further processing, such as estimating the normalized median ...”

Corrected. (L74)

L139: By “A000”, I guess you mean “AX000”?

Corrected. (L132)

L145-146: Please make sure that units are well defined e.g., m w.e. a-1 for AX010 and AX000 geodetic mass balance rates. This comment holds for the whole manuscript. For completeness, could you add the AX000 geodetic mass balance rate (-1.060 +/- 0.023 m w.e. a-1) in Table S4 and provide a reference to the latter Table S4 in L145-146.

Corrected (L139-140/L254/Table1), and SI confirmed. I added B_geod for AX000 in Table S4.

L175: The mass balance rate of 1.48 +/- 0.08 has no units (m w.e. a-1) and is not listed in Table S4? Could you verify if this is a mistake? For consistency, please use a similar number of digits across the text (e.g. 3 as in L145-146) when listing mass balance rates.

This is the precipitation parameter (r_P), which has no dimension. Because this sentence states “The parameters...yielded a value of 1.48...”, I did not change the expression. (L168)

L177-178: “In contrast ... Trakarding AWS site” This sentence is somewhat unclear, as it makes three relationships between Glacier AX010 and ERA5, ERA5 and Trakarding, and Glacier AX010 and Trakarding. To clarify, you could cut the sentence as: “In contrast, at Glacier ... ERA5 underestimates precipitation by XX m w.e. There, precipitation is more than five times greater ... AWS site (XX m w.e.).”

Thank you for the suggestion. I added the values in 2023 as “In contrast, at Glacier AX010, located 16 km to the southeast of the AWS site, ERA5 underestimates precipitation ($3.49 \text{ m w.e. a}^{-1}$ at AX010 against $2.36 \text{ m w.e. a}^{-1}$ in ERA5 for 2023). There, precipitation is more than five times greater than at the Trakarding AWS site ($0.62 \text{ m w.e. a}^{-1}$ for 2023).” (L170-172)

L180: By “good reproducibility” do you mean “good agreement” or “from pressure levels align with observational data”, please clarify.

Corrected to the former. (L174)

Section 3.4 L214-254: In this section multiple different periods are sampled to estimate trends, and the discussion goes back and forth between those. As a result, it is sometimes unclear which period is considered. Please make sure to explicitly state which period is sampled when a trend is listed. You could state at the beginning of the section that e.g. “long-term” means 1941-2023, and refer to “long-term trends” where appropriate, and specifically mention shorter periods when these are discussed.

Thank you for the suggestion. I added “long-term” for the entire trend and added the periods if necessary. (Section 3.4)

L272: “the thickest part of the glacier” is rather vague, could you express this in % of the total ice volume?

Because it means the glacier will completely disappear, I removed “the thickest part of”. (L267)

Figure 1: Consider highlighting previous 1978-2007 estimates as, e.g., dashed orange line, so readers identify at first glance your new data sets. Add a reference to Table S4: “ B_{geod} obtained in previous studies are also shown (Fujita et al., 2001; Fujita and Nuimura, 2011) (Table S4).” See also the comment above in L145-146.

Thank you for the suggestion. I changed the previous data to a dashed line. In Table S4, B_{geod} obtained from the previous studies has already been addressed as “ B_{geod} before 2008 are from Fujita et al. (2001) and Fujita and Nuimura (2011).” I added B_{geod} for AX000 in Table S4.

Supplementary Figure S8: labels b and c are swapped on the second and third subfigures.

Thank you for pointing it out. Corrected.

Supplementary Table S4: For completeness, could you list geodetic mass balance data for glacier AX000 (light orange line in Fig. 1d) in Table S4 as well.

Added.

Supplementary Table S5: in L4 of the caption “root” instead of “route”.

Corrected.

In references, in-press studies were corrected.