

Response to referee #1

We thank the referee for the comments on our manuscript. We answer all comments in blue font.

General comments:

The article provides a very good understanding of the topic that gives the reader an overview of glacier retreat and subsequent proglacial lake formation across the Himalayas region. The research was well conducted, and information was presented accordingly.

Thank you for your comments.

The research observed the dynamic changes in two glaciers in the Bhutanese Himalaya, which should reflect on the article's title.

Thank you for your useful suggestion. However, the main aim of this study is to trace the fluctuations of the Thorthormi glacier (land- to lake-terminating transition). Luge Glacier was shown as a “reference glacier” to contrast Thorthormi Glacier. Therefore, we would like to keep this title.

The methodology and data analysis has been well explained in each section, but the overall methodology of how different sets of data (with different source and resolution) are compared and analyzed would help readers to get a better understanding.

We received similar comments from referee #2 (regarding dh/dt), so we will change Fig.3, which shows elevation changes based on resampled DEMs (all 30 m resolutions).

In terms of surface flow velocities, we also used different resolutions datasets. We had described the effect of different resolution in the result section (lines 243-245) as “The ITS_LIVE velocity profile possesses $<5 \text{ m a}^{-1}$ flow velocities for the entire glacier, which is probably due to the coarser resolution (240 m) of the velocity field compared with that in this study (10 m) and Tsutaki et al. (2019; 15 m).”

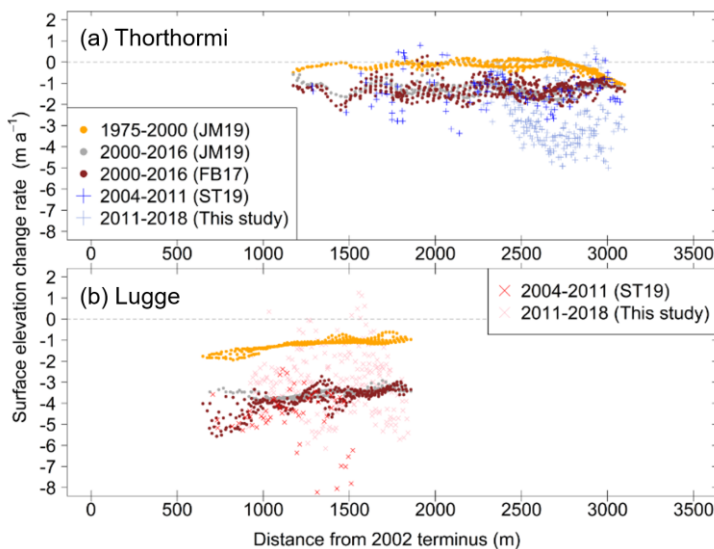


Figure 3 revised.

Technical corrections:

"ITS_LIVE" has not been explained through the article.

We will add an explanation about "ITS_LIVE" in lines 139-142 as "We extracted the surface velocity from regional velocity product derived from Inter-Mission Time Series of Land Ice Velocity and Elevation (ITS_LIVE) project (Gardner et al., 2019), which covered the entire HMA region. The ITS_LIVE velocity product is generated from Landsat 4, 5, 7, and 8 with the auto-RIFT feature tacking processing chain (Gardner et al., 2018) and possesses a 240-m spatial resolution."

We will add reference "Gardner, A. S., Moholdt, G., Scambos, T., Fahnestock, M., Ligtenberg, S., van den Broeke, M., and Nilsson, J.: Increased West Antarctic and unchanged East Antarctic ice discharge over the last 7 years, *cryosphere*, 12, 521–547, <https://doi.org/10.5194/tc-12-521-2018>, 2018."

"GAMDAM" has not been explained through the article.

We will add an explanation of GAMDAM glacier inventory and change lines 62-65 as "To determine the glacier outlines, we employed "Glacier Area Mapping for Discharge from the Asian Mountains" inventory (GAMDAM glacier inventory; Nuimura et al., 2015; Sakai et al., 2019) covering throughout high-mountain Asia."