This manuscript investigates the change to the Khumbu glacier in the Nepalese Himalaya under future climate change, extended to 2100 using downscaled regional climate models from CORDEX, and to 2300 using delta change forcing. The study incorporates statistical climate downscaling, energy and mass balance modelling using COSIPY, and glacier modelling using iSOSIA.

The manuscript is well written and presents an important updated projection for the future of the Khumbu glacier. Of particular interest is the result that precipitation changes may considerably offset glacier mass balance loss caused by warming, under a moderate climate emissions scenario. In addition, the comparison of the future results to mass loss already committed by current warming provides a useful benchmark.

Due to the ambitious use of three different modelling/statistical techniques described in a concisely written paper, I have a few questions regarding some choices and methods, detailed below. I appreciate the authors' effort to keep the manuscript brief and easily readable, so would recommend any substantial additions to methods be added to the appendices rather than the main text, but this is of course at the discretion of the authors.

Comments

Line 117: 'RCMs were assessed…' Was this something the authors did? If so, were these RCMs compared against other CORDEX models? Based on fig. A3, the raw RCMs seem poor at representing the annual cycle in precipitation. While the quantile mapping has largely rectified this, it may be worth commenting in section 4.1 on the reliability of future precipitation trends from the model if the monsoon is poorly represented in the present day. Also relevant at line 394 inferring these CORDEX models give a good performance.

Lines 123-126: Could you add a reference or plot to show that these CMIP models span the range of possible future scenarios for precipitation? How do these CMIP models compare in terms of temperature increases? This would be particularly useful compared to the 10 GCMs used by Rounce et al., (2023), to determine whether higher temperature projections are contributing to the difference in mass loss. The average and range of equivalent climatic changes for the GCMs used in Rounce et al., (2023) could perhaps be added to Table 1, to cover both points.

Section 2.2: Quantile mapping can cause biases in future model-projected trends (e.g. fig. 2 Cannon et al., 2015). Does the method used here preserve the trends from the RCMs? In addition, assuming the RCMs have the common problem of too many wet days, does the method used act to correct frequency of precipitation?

Line 131 and throughout: the time periods used get a little confusing. I think that 14 years of AWS data (2006-2019) is used to downscale 5 years of COREX model data (2015-2020). Could this be clarified in the methods, as it wasn't fully clear until the discussion.

Section 2.3: Are all meteorological inputs to COSIPY taken from the nearest RCM point? Except for precipitation and temperature, was any correction applied to other variables (e.g. to atmospheric pressure to correct for the elevation difference)?

Section 2.4: What forcing was used for the glacier modelling between the present day and future 5-year time slices?

Figure 3 doesn't appear to be referred to in the text.

Line 295: I'm not sure where the observations of present-day state, or the recent (<50 years) change are in figure 4. If this was meant to be the reference to figure 3, could the authors clarify in the figure caption where the 50 years comes from?

Line 297: As I understand it, the model performs better with the mass-balance calculated within the glacier model, rather than by COSIPY. Could the authors clarify which method is used for future projections?

Line 357-360, and fig. 7 and 8: Could the authors clarify the difference in results (up to 2100) shown in fig. 7 b compared to fig. 8? The discussion of difference between RCP scenarios seems to hold true for fig. 7, but not 8.

Line 456 and figure 8: The mass change between this study and Rounce et al., (2023) appears to relate to different starting points, e.g. this study projects a loss of ~35% compared to a 2010 glacier mass, whereas Rounce et al., (2023), project a loss of ~75% compared to the 2000 glacier mass. The comparison might be more suitable if both graphs were shown in relation to the same starting value, i.e. by shifting the curves for Rounce et al., (2003) up to start at the projected 2010 value. I would also suggest changing the colour of the line Rounce et al., (2003) RCP2.6 (or removing entirely), as it is similar to this study's RCP4.5.

Section 4.2 Are there other studies of future mass loss in the nearby region that could be included in the comparison discussion here? E.g. Khadka et al., (2020)

Table1: typo in 2300 heading (should be "change from 2200 CE…"?).

Line 161: "represent moderate and extreme warming…" change to moderate and extreme emissions scenarios, rather than warming.

Figure 5 and 6: please define h_0 in the figure caption.

References

Cannon, Alex J., Stephen R. Sobie, and Trevor Q. Murdock. "Bias correction of GCM precipitation by quantile mapping: how well do methods preserve changes in quantiles and extremes?." Journal of Climate 28.17 (2015): 6938-6959.

Khadka, Mira, Rijan Bhakta Kayastha, and Rakesh Kayastha. "Future projection of cryospheric and hydrologic regimes in Koshi River basin, Central Himalaya, using coupled glacier dynamics and glacio-hydrological models." Journal of Glaciology 66.259 (2020): 831-845.