Author's Responses to Steven Margulis's comments on *"Brief communication: Reanalyses underperform in cold regions, raising concerns for climate services and research"*

Bin Cao[1], Stephan Gruber[2]

[1]State Key Laboratory of Tibetan Plateau Earth System Environment and Resources (TPESER), National Tibetan Plateau Data Center (TPDC), Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing, China
[2]Department of Geography & Environmental Studies, Carleton University, Ottawa, ON, Canada

Correspondence: Bin Cao (bin.cao@itpcas.ac.cn)

This is nice work, highlighting the issue of the high uncertainty of estimates of cold-land processes in reanalysis that are often used for making assessment of snow-derived water availability and how it may be changing. Some recent work that compared some of these global products to an observationally-constrained snow reanalysis dataset shed similar light and may be worth including in the Introduction for context.
Response: In a potential revision, we will incorporate Fang et al., (2023) in the Introduction, and Zhou et al., (2024) in Results (Sec. 3.1).:

*"Other studies report the performance of reanalyses for specific variables and places (e.g., Graham et al., 2019; Cao et al., 2020; **Fang et al., 2023**)."*

*"Previous studies reported that the snow uncertainties in mountains are related to the performance of numerical weather prediction models in representing precipitation and snow processes (Domine et al., 2019, Cao et al., 2020, **Zhou et al., 2024**), especially the well-known bias in MERRA-2 precipitation (Reichle et al., 2017)."*

References

Fang, Y., Y. Liu, D. Li, H. Sun, and S.A. Margulis, 2023. Spatiotemporal snow water storage uncertainty in the midlatitude American Cordillera, The Cryosphere, 17, 5175–5195, https://doi.org/10.5194/tc-17-5175-2023

Liu, Y., Y. Fang, D. Li, and S.A. Margulis, 2022. How well do global snow products characterize snow storage in High Mountain Asia? Geophysical Research Letters, 49, e2022GL100082. https://doi.org/10.1029/2022GL100082