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Dr. Tobias Bolch

Editor

The Cryosphere

Copiapó, 12 January 2026

Dear Dr. Tobias Bolch,

Please find enclosed the revised version of our manuscript entitled “Introducing a new normalized cryospheric index (NCI) to categorize sub-watersheds in arid environments”, originally submitted as EGU sphere-2025-1198 and now resubmitted to The Cryosphere as a research article.

We have carefully addressed all comments and suggestions provided by the editor. The manuscript has undergone substantial revision, with significant improvements in conceptual clarity, methodological robustness, and alignment with current cryospheric literature.

In particular, we have:

Adopted the term debris-free glaciers consistently throughout the manuscript.

Strengthened the hydrological and conceptual framework distinguishing cryospheric reserves and resources in arid Andean basins.

Updated the ice-volume estimation methodology using physically based approaches, including the global consensus ice-thickness product of Farinotti et al. (2019) for debris-free glaciers.

Implemented a unified viscoplastic framework following Cicoira et al. (2020, 2021) to estimate ice thickness in rock glaciers and other ice-rich permafrost landforms, supported by DInSAR-derived surface velocities.

Revised the uncertainty assessment, incorporating mapping uncertainty following Paul et al. (2013) and cryoform-specific uncertainty ranges consistent with recent literature.

Due to time constraints associated with the preparation of the revised manuscript and the substantial restructuring of several sections, we were unable to generate a dedicated track-changes PDF file comparing the revised version with the discussion paper. However, all modifications relative to the EGU sphere discussion manuscript are fully incorporated in the revised submission, and the changes are clearly identifiable through the updated structure, expanded sections, and revised figures and tables. We remain fully available to provide a track-changes file or any additional documentation should this be required during the editorial process.

We thank you for your constructive guidance and hope that the revised manuscript is now suitable for further consideration in The Cryosphere.



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