

Earth Syst. Sci. Data Discuss., author comment AC1
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Reply on CC1

Dahong Zhang et al.

Author comment on "A new global dataset of mountain glacier centerlines and lengths" by
Dahong Zhang et al., Earth Syst. Sci. Data Discuss.,
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Thanks for your helpful comments to improve this manuscript.

Comment: Just a quick look. I downloaded the shared data and checked how it performed on the Tibetan Plateau indeed, and it was good overall. But there are many large glaciers with missing centerline data, such as the Karakorum region, is there any way to compensate for this?

Response: Thanks for your insights. Mountain glaciers on the Tibetan Plateau involve three glacier regions: Central Asia (R13), South Asia West (R14), and South Asia East (R15). The dataset has 95.73% (91455/95536) coverage in High Asia (R13, R14 and R15). The glaciers that are not provide centerlines are mainly 1545 ice caps in R13 and 1946 defect glaciers in R14. Almost all glaciers in the Karakorum region are in R14, but the glacier outlines of R14 in the RGI v6.0 rely on automated extraction algorithm and they are generally jagged and have geometric flaws.

In the recent version of this dataset (<https://doi.org/10.11922/sciencedb.01643>), prioritizing the coverage of this dataset, we designed a geometry-based algorithm to repair *FGODS* and provided data users with 10676 centerlines of these glaciers in the form of supplementary dataset. Corresponding codes and results see sub-datasets *CODES* and *SUP_220707*. After the update, the coverage of this dataset in the mountain glaciers of High Asia has increased from 95.73% to 97.78%, and coverage in the R14 **has increased from 92.12% to 99.01%** (27711/27988). Unfortunately, nominal glaciers and ice caps still lacks the qualified sources of glacier outlines to calculate their centerlines.

For some glaciers that are not provided centerlines in this dataset, data users need to **update** the corresponding glacier outlines and **use** the automatic extraction tool provided in this study to **generate** their centerlines, which involves the defective glacier outlines (*FGODS*), nominal glaciers and ice caps of RGI v6.0. The *FGODS* and nominal glaciers are easy to generate centerlines as long as there are correct glacier outlines. However, automatic approaches dividing ice caps from glacial complexes into individual glaciers are currently limited, and data users only can use own criterion to divide ice caps and then use our tool to generate centerlines.