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Maturity of worldwide glacier data sets – history and future ambitions

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The creation and curation of environmental data present numerous challenges and rewards. In this study, we reflect on the maturity of freely available glacier data sets (inventories and changes), as well as on related demands by data providers, data users, and data repositories in-between. The amount of glacier data has increased significantly over the last two decades, especially as remote-sensing techniques have developed quickly. The portfolio of observed parameters has increased as well, which presents new challenges for international data centers, and fosters new expectations from users.

We assess the services of the Global Terrestrial Network for Glaciers (GTN-G) as the central organization for standardized data on glacier distribution and changes. Within GTN-G, different glacier data sets are consolidated under one umbrella, and the glaciological community supports this service by actively contributing their data sets and by providing strategic guidance via an Advisory Board. To assess each GTN-G data set, we present a maturity matrix and summarize achievements, challenges, and future ambitions.

Most challenges can only be overcome in a financially secure setting for data services and with the help of international standardization. Therefore, dedicated support and long-term commitment for certified data repositories build the basis for the successful democratization of data. In the field of glacier data, this balancing act has so far been successfully achieved through joint collaboration between data repositories, data providers, and data users. However, we also note an unequal allotment of funds for data creation and projects using the data, and data curation. Considering the importance of glacier data to answering numerous key societal questions (from water availability to global sea-level rise), this imbalance needs to be adjusted. In order to guarantee the continuation and success of GTN-G in the future, basic funding schemes, flexible adaptation measures, and regular evaluations are required.