EGU24-4066, updated on 25 Mar 2025
https://doi.org/10.5194/egusphere-egu24-4066
EGU General Assembly 2024

Reconciled regional & global glacier mass changes 2000–2022

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Glacier changes are a sign of climate change and have an impact on the local hazard situation, region runoff, and global sea level. In previous reports of the Intergovernmental Panel on Climate Change (IPCC), the assessment of glacier mass changes was hampered by spatial and temporal limitations as well as by the restricted comparability of different observing methods. The Glacier Mass Balance Intercomparison Exercise (GlaMBIE; https://glambie.org) aims to overcome these challenges in a community effort to reconcile in-situ and remotely sensed observations of glacier mass changes at regional to global scales.

In this contribution, we will present the approach and results of the new data-driven consensus estimation of regional and global mass changes from glaciological, DEM-differencing, altimetric, and gravimetric methods. Our reconciled estimate suggests a global glacier mass loss of about 5,500 Gt from 2000 to 2022, with an acceleration of about 25% when comparing the second with the first half period. Since 2000, glaciers regionally have lost between 1 and 30% of their total ice volume, and about 4.5% globally. We will discuss these results in view of differences between observation methods and in comparison to previous IPCC reports, the implications for regional glacier mass loss and global sea-level rise, and remaining opportunities for further research.

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