



National and global glacier monitoring efforts – a comparative assessment

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The World Glacier Monitoring Service (WGMS) and its global network of collaborators maintain a comprehensive programme of ongoing glacier change, resulting in an unprecedented dataset that serves as an increasingly important basis for fundamental glacier research and various applications at local, regional, and global scales. Knowledge of glacier distribution and quantification of glacier change is crucial for assessing the impact of glacier shrinkage on regional freshwater availability, local geohazards, tourism, sites of cultural significance, and global sea levels. Therefore, glacier monitoring is essential for the development of sustainable adaptation strategies in regions wherever glaciers (still) exist.

In this presentation, we assess the status of glacier monitoring in each country in 2025 and compare it to the 2015 baseline (Gärtner-Roer *et al.*, Mountain Research and Development, 2019). During this time, surface elevation changes derived from satellite data reached nearly global coverage. In addition, temporal but also spatial gaps could be filled by adding new glaciological *in situ* series thanks to data rescue efforts. For each country, we describe the number of observed glaciers and total number of observations available in the WGMS Fluctuations of Glaciers (FoG) database for the following observation types: front variation, glaciological surface mass balance, and geodetic surface elevation change. In addition, we review the availability of glacier outline inventories and the annual mass-balance trend in each country.

Finally, we discuss the role of glacier monitoring in international research and policy-making to place our results in the context of global climate-change monitoring. With the advent of new datasets, such as those derived from satellites, information on glaciers transcends national boundaries. However, limited funding often hampers the long-term monitoring of glaciers, regardless of data source. In view of the International Year of Glaciers' Preservation in 2025 and the United Nations (UN) Decade of Action for Cryospheric Research in 2025–2034, we establish a 2025 baseline and make recommendations for the future of glacier research.