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Global Terrestrial Network for Glaciers – from a research-based collaboration network towards an operational glacier monitoring service

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Glaciers have been internationally recognized as an Essential Climate Variable. Their decline over the past century is not only a high-confidence indicator for climate changes but directly impacts on the local hazard situation, the regional water cycle, and global sea-level rise. The international coordination of glacier observations was initiated in 1894 and has resulted in unprecedented datasets of glacier distribution and changes (cf. http://www.gtn-g.org). Today, the Global Terrestrial Network for Glaciers (GTN-G) is the framework for the coordinated glacier monitoring in support of the United Nations Framework Convention on Climate Change (UNFCCC). Within GTN-G, the responsible data repositories and analysing services actively compile standardized glacier data based on a worldwide scientific collaboration network and through a series of research projects using NASA and ESA sensors. In this presentation, we provide a brief overview on the multi-level monitoring strategy, available datasets, and related web-interfaces. In view of the new Copernicus Climate Change Service (https://climate.copernicus.eu/), we present recent progress in assessing global glacier distribution and changes, disclose remaining observational gaps in both in-situ and remote sensing datasets, and discuss challenges to be tackled on the way towards a truly operational glacier monitoring service.