

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

Zemp, M. <sup>(1)</sup>, Raup <sup>(3, 4)</sup>, B.H., Paul, F. <sup>(1,5)</sup>, Nussbaumer, S.U. <sup>(1)</sup>, Mölg, N. <sup>(1)</sup>, Machguth, H. <sup>(1)</sup>, Hoelzle, M. <sup>(2)</sup>, Gärtner-Roer <sup>(1)</sup>, I., Fetterer, F. <sup>(3)</sup>, Armstrong, R. <sup>(3)</sup>

<sup>(1)</sup> World Glacier Monitoring Service (WGMS), University of Zurich, Zurich, Switzerland

<sup>(2)</sup> World Glacier Monitoring Service (WGMS), University of Fribourg, Fribourg, Switzerland

<sup>(3)</sup> US National Snow and Ice Data Center (NSIDC), Boulder, USA

<sup>(4)</sup> Global Land Ice Measurements from Space (GLIMS) initiative, Boulder, USA

<sup>(5)</sup> Global Land Ice Measurements from Space (GLIMS) initiative, University of Zurich, Switzerland

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 Glacier (GTN-G) is the framework for the coordinated glacier monitoring in support of the United Nations Framework Convention on Climate Change (UNFCCC). GTN-G is jointly run by the World Glacier Monitoring Service (WGMS), the US National Snow and Ice Data Center (NSIDC), and the Global Land Ice Measurements from Space (GLIMS) initiative. GTN-G actively compiles 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 GCOS implementation plan, 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.