

Continued strong glacier mass loss in 2015 – an updated overview of available glacier observations

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Changes in glaciers and ice caps provide some of the clearest evidence of climate change, with impacts on sea-level variations, regional hydrological cycles and natural hazard situations. Observations show that glaciers around the world are in retreat and losing mass. Internationally coordinated for over a century, glacier monitoring activities provide a remarkable dataset of glacier observations from ground, air and space. In this presentation we give an updated overview and analysis of the main observational dataset compiled by the World Glacier Monitoring Service (WGMS).

The dataset contains glacier front variations with about 46,000 entries since the 17th century and about 6,200 glaciological and 2,600 geodetic mass (volume) change observations dating back to the 19th century. These data reveal clear evidence that glacier retreat and mass loss is a global phenomenon. Intermittent re-advance periods at regional and decadal scale are normally restricted to a subsample of glaciers and have not come close to achieving the maximum positions of the “Little Ice Age” (or Holocene). Glaciological and geodetic observations show that the rates of the 21st-century mass loss are unprecedented on a global scale, for the time period observed, and probably also for recorded history, as indicated in glacier reconstructions from written and illustrated documents. This strong imbalance implies that glaciers in many regions will very likely suffer further ice loss, even if climate remains stable. The database is completed by specific index datasets (e.g., glacier thickness data) and a dataset containing information on special events including glacier surges, glacier lake outbursts, ice avalanches, eruptions of ice-clad volcanoes, etc. related to about 300 glaciers.

All glacier datasets are made freely available from the WGMS, through the new “wgms Glacier App”, and within the Global Terrestrial Network for Glaciers (GTN-G, data access: http://www.gtn-g.org/data_browser/). GTN-G ensures the continuous development and adaptation of the international monitoring strategies to the long-term needs of users in science and policy. Current efforts are to re-establish or complement former measurements in different regions, and especially in regions with limited observational data, to establish a well-distributed baseline which is absolutely necessary for impact assessments regarding run-off estimations, glacier risks, or predictions for the future.