

Name of research institute or organization:

**Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie (VAW),
ETH Zürich**

Title of project:

Glaciological investigations on the Grosser Aletschgletscher

Project leader and team:

Dr. Andreas Bauder, project leader
Dr. Daniel Farinotti, Nina Zoller and Hermann Bösch

Project description:

Long-term glacier observations have been carried out to document glacier variations of Grosser Aletschgletscher and include annual length change measurements since 1880, accumulation and mass balance measurements starting in 1918, repeated map or arial photograph surveys, complemented by stream runoff in the Massa river since 1922 by **BAFU**, respectively.

In an ongoing project the length, area, volume, and mass changes are continuously observed applying modern remote sensing techniques as well as direct field measurements. The research activities are focused on long term trends and seasonal fluctuations. Net volume changes of the entire glacier are calculated by comparison of digital elevation models. Mass balance components with firm accumulation and ablation are measured in detail at Jungfraufirn.

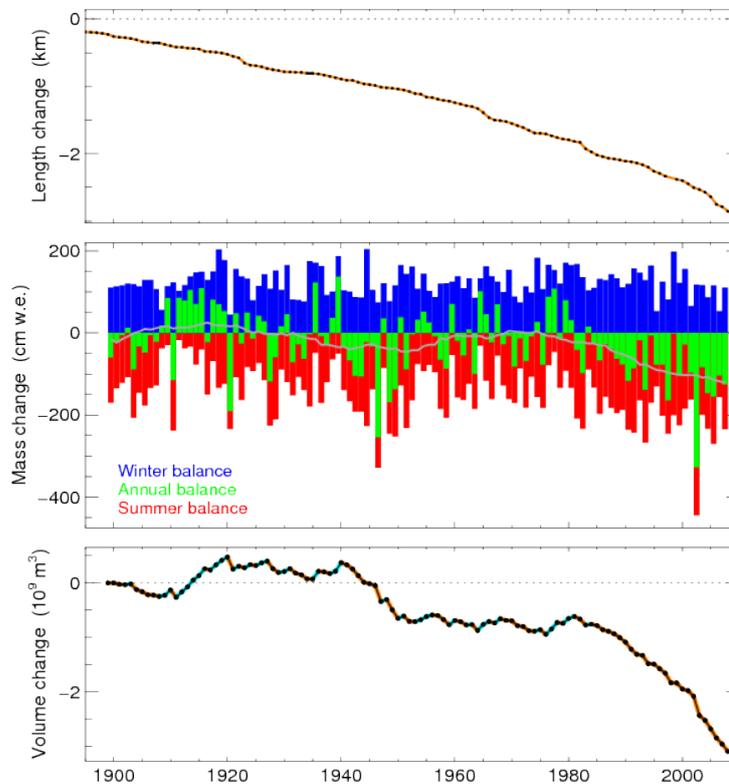


Figure: Frontal variation (top), mass balance (center) and volume change (bottom) of Grosser Aletschgletscher since 1900.

The photogrammetrical evaluation of recent arial photographs taken in fall 2009 allowed a periodic update of the volume change and mass balance for Grosser Aletschgletscher since the last detailed survey of the glaciers in the Aletsch area of 1999. A further significant volume loss over the last decade was observed. The rate of loss increased in comparison with the two previous decades 1980-99. Strong negative mass balances occurred and not a single positive or nearly balanced year was present. As a result of the ongoing mass losses the glacier front further retreated.

Key words:

Glacier measurements, firn accumulation, ice melt, volume change, mass balance

Internet data bases:

http://www.vaw.ethz.ch/people/gz/abauder/projects/data/gz_141_variations_gr_aletschgretscher

Collaborating partners/networks:

Swiss Glacier Monitoring Network
Federal Office for the Environment (BAFU)

Scientific publications and public outreach 2012:

Refereed journal articles and their internet access

Farinotti, D., S. Usselman, M. Huss, A. Bauder and M. Funk, Runoff evolution in the Swiss Alps: projections for selected high-alpine catchments based on ENSEMBLES scenarios, *Hydrological Processes*, **26**, 13, 1909-1924, doi: 10.1002/hyp.8276, 2012. <http://dx.doi.org/10.1002/hyp.8276>

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