

Name of research institute or organization:

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

Title of project:

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Variations of the Grosser Aletschgletscher

Project leader and team:

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Dr. Andreas Bauder, project leader  
2-4 coworkers and field assistants

Project description:

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Long-term glacier observations have been carried out to document glacier variations of Grosser Aletschgletscher:

- Since the 1880's the length changes at the glacier tongue were recorded annually.
- Starting in September 1918, the firm accumulation and mass balance was measured on Jungfraufirn. These are the second longest time series of in-situ stake measurements.
- Hydrological runoff measurements of the whole catchment area started in 1922.
- Special high precision topographic maps covering the whole catchment area of the branched glacier system have been produced repeatedly in 1926/27 and 1957. These maps are complemented by an earlier map from 1880 and recent repeated surveys of aerial photographs.

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. Net volume changes are calculated by comparison of digital elevation models (DEM) derived from the existing maps and photogrammetrical analysis. A new method for the determination of the glacier wide mass balance has been developed merging available point-based observations with net volume changes and runoff measurements.

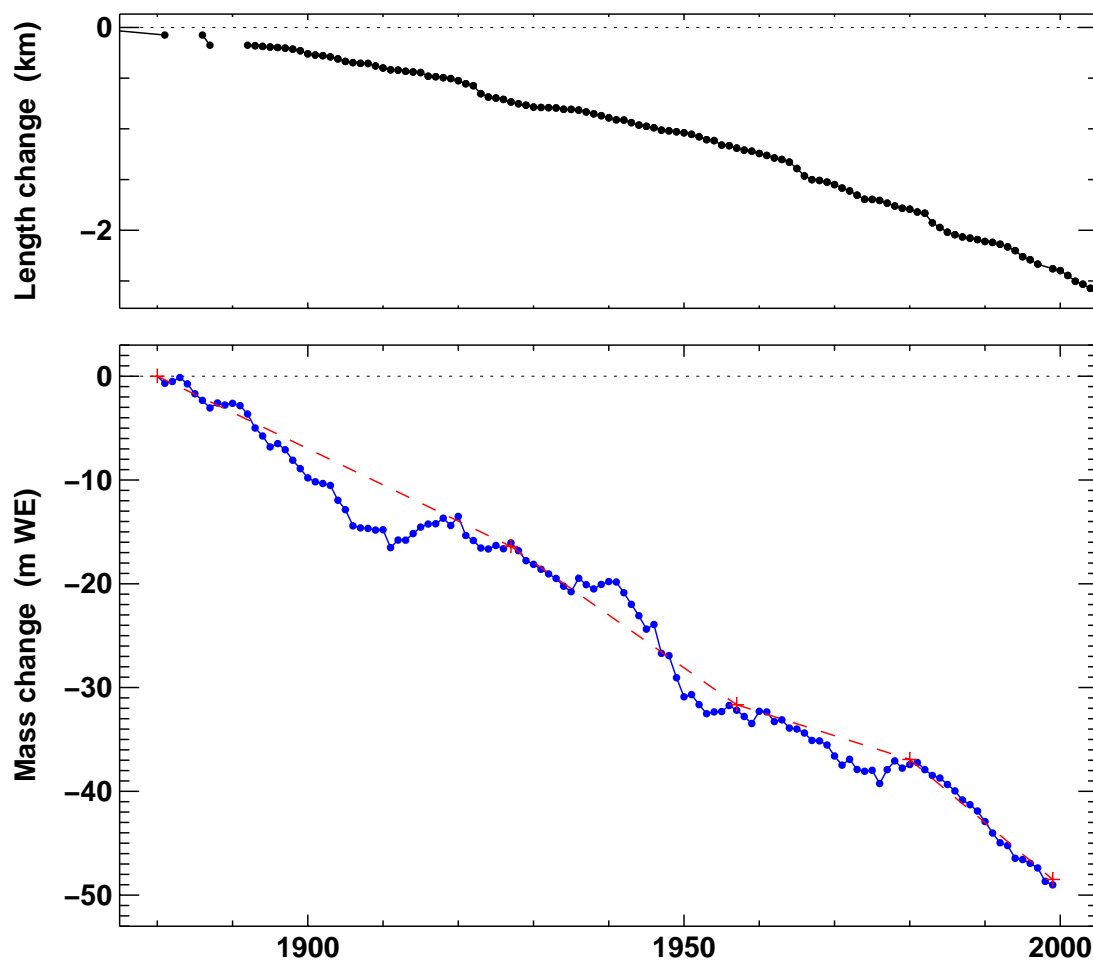


Fig.1: Cumulative length (upper) and mass (lower) changes of the Grosser Aletschgletscher: results from mass balance model (blue) and net volume changes extracted from comparison of surface topography (red).

Key words:

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

Internet data bases:

[http://www.vaw.ethz.ch/research/glaciology/glacier\\_change/gz\\_variations\\_gr\\_aletschgletscher](http://www.vaw.ethz.ch/research/glaciology/glacier_change/gz_variations_gr_aletschgletscher)

Collaborating partners/networks:

Swiss Glacier Monitoring Network in collaboration with the Glaciological Commission of the Swiss Academy of Sciences (SCNAT)

Scientific publications and public outreach 2006:

**Conference papers**

Bauder A. and Huss M., Variations of the Grosser Aletschgletscher, International Conference in celebration of the 75<sup>th</sup> anniversary of High Altitude Research Station Jungfrauoch, Interlaken, 11.-13. Sept. 2006.

Huss M. and Bauder A., Reconstruction of seasonal mass balance for 4 Swiss glaciers since 1865 using decadal volume changes. 4th Swiss Geoscience Meeting, Bern, Schweiz, 25.11.2006.

**Data books and reports**

Bauder A., Pralong A., Funk M. and Faillettaz J. Die Gletscher der Schweizer Alpen - Les glacier des Alpes suisses 2003/04 und 2004/05. Die Alpen - Les Alpes, 82(10), 34-43, 2006.

Address:

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ETH Zürich

Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie (VAW)

Gloriastrasse 37/39

CH-8092 Zürich

Contacts:

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Andreas Bauder    Tel. +41 44 632 4112    e-mail: [bauder@vaw.baug.ethz.ch](mailto:bauder@vaw.baug.ethz.ch)

Martin Funk        Tel. +41 44 632 4132    e-mail: [funk@vaw.baug.ethz.ch](mailto:funk@vaw.baug.ethz.ch)

URL: <http://www.vaw.ethz.ch/gz/>

