

Name of research institute or organization:

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

Title of project:

Variations of the Grosser Aletschgletscher

Project leader and team:

Dr. Andreas Bauder, project leader
2-4 coworkers, field assistants and support by the custodians

Project description:

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 (1980, 1999).

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.

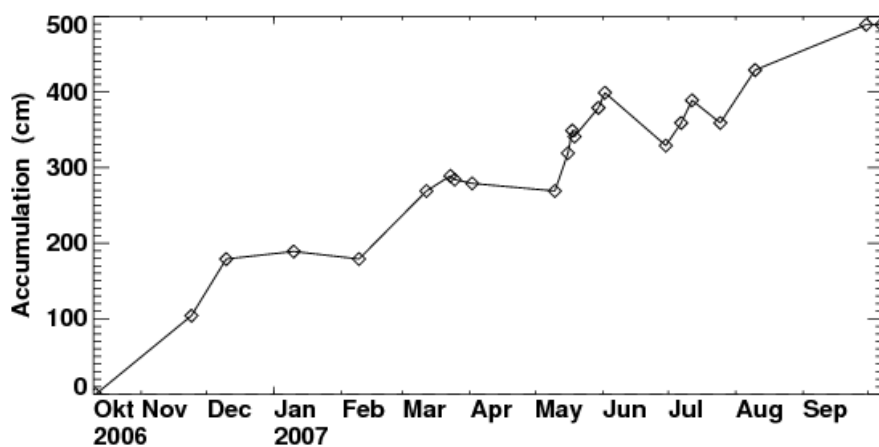


Figure: Evolution of snow and firn accumulation on Jungfraufirn (3350 m a.s.l.) during the past observation period of 2006/07

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_aletsch_gletscher

Collaborating partners/networks:

Swiss Glacier Monitoring Network in collaboration with the Cryospheric Commission of the Swiss Academy of Sciences (SCNAT), Federal Office for the Environment (BAFU)

Scientific publications and public outreach 2007:

Refereed journal articles

Bauder, A., M. Funk, and M. Huss, Ice volume changes of selected glaciers in the Swiss Alps since the end of the 19th century. *Annals of Glaciology* **46**, 145-149, 2007

Conference papers

Huss, M., D. Farinotti, A. Bauder and M. Funk, Grosser Aletschgletscher in the 21th century: Modelling glacier evolution and stream-flow runoff, 5th Swiss Geoscience Meeting, Genf, Switzerland, 17.11.2007

Data books and reports

Bauder, A., R. Meister and D. Vonder Mühll, Messnetze der Kryosphäre: Schnee, Gletscher, Permafrost. Hydrologischer Atlas der Schweiz, Tafel 3.1. (2007)

Public outreach

Bauder A., "Die Schweizer Gletscher in einem sich verändernden Klima", Rotary-Club Schaffhausen, 8.1.2007

Bauder A., "Gletscherveränderungen in den Schweizer Alpen", Studienwoche Freie Waldorfschule Esslingen, Steingletscher, 18.7.2007

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