

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
2-4 field assistants and support by the custodians

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 are calculated by comparison of digital elevation models (DEM) derived from the existing maps and photogrammetrical analysis. Mass balance components with firn accumulation and ablation are measured in detail at Jungfraufirn.

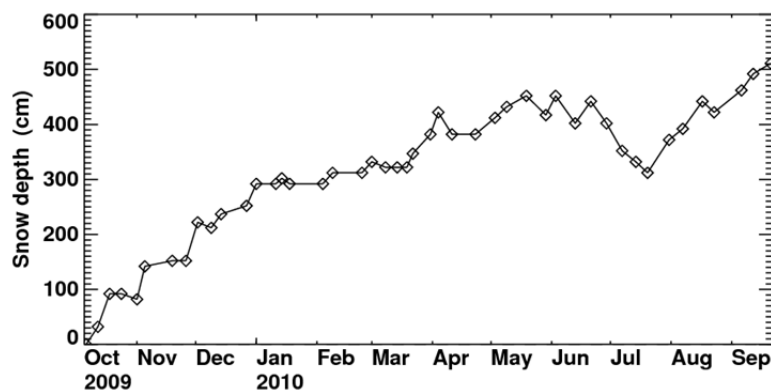


Figure: Evolution of snow and firn accumulation at site P3 on Jungfraufirn (3350 m a.s.l.) during the past observation period of 2009/10

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

Collaborating partners/networks:

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

Scientific publications and public outreach 2010:

Refereed journal articles and their internet access

Huss, M., Hock, R., Bauder, A. and Funk, M., The 100-year glacier mass changes in the Swiss Alps linked to the Atlantic Multidecadal Oscillation. *Geophysical Research Letters*, **37**, L10501, 2010, DOI:10.1029/2010GL042616.

<http://dx.doi.org/10.1029/2010GL042616>

Lüthi, M and Bauder, A., Analysis of Alpine glacier length change records with a macroscopic glacier model. *Geographica Helvetica*, **65(2)**, 92-102, 2010.

Lüthi, M., Bauder, A. and Funk, M., Volume change reconstruction of Swiss glaciers from length change data. *Journal of Geophysical Research*, **115**, F04022, 2010, DOI:10.1029/2010JF001695.

<http://dx.doi.org/10.1029/2010JF001695>

Pellicciotti, F., Bauder, A. and Parola, M., Effect of glaciers on streamflow trends in the Swiss Alps. *Water Resources Research*, **46(10)**, W10522, 2010, DOI:10.1029/2009WR009039.

<http://dx.doi.org/10.1029/2009WR009039>

Theses

Farinotti, D., Simple methods for inferring glacier ice-thickness and snow-accumulation distribution, PhD Thesis, ETH Zürich, 2010.

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