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
Matthias Huss, 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 1918, stream runoff in the Massa river since 1922 and repeated map or arial photograph surveys, 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. Net volume changes are calculated by comparison of digital alevation models (DEM) derived from the existing maps and photogrammetrical analysis. A new method for the determination of the glacier wide mass balance has been developped merging available point-based observations with net volume changes and runoff measurements.

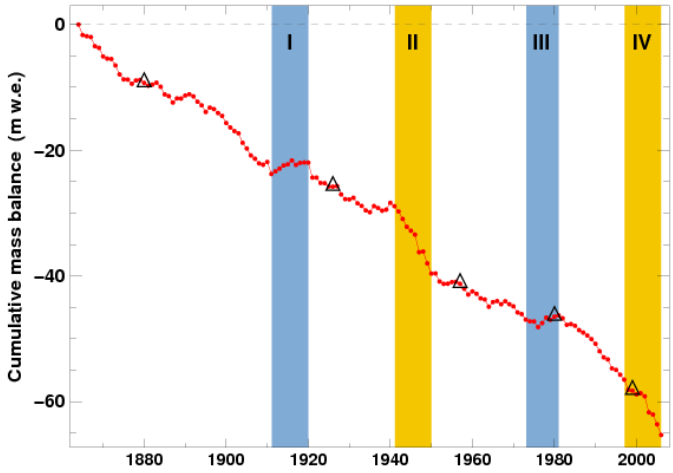

Figure: Cumulative mass balance of Grosser Aletschgletscher since 1864. Triangles mark years of DEMs used for volume change determination. Two decadal periods with positive (I, III) and strongly negative (II, IV) mass balances are highlighted.

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_aletschgretscher

Collaborating partners/networks:

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

Scientific publications and public outreach 2008:

Refereed journal articles and their internet access

Huss, M., Bauder, A., Funk, M. and Hock, R. Determination of the seasonal mass balance of four Alpine glaciers since 1865. *Journal of Geophysical Research*, **113**(F1), F01015, doi:10.1029/2007JF000803. 2008.

Conference papers

A. Bauder and M. Huss, Long term point observations of seasonal mass balance: a key to understanding 20th century climate change", Workshop on mass balance measurements and modelling, Skeikampen, Norway, 26-28 March, 2008.

M. Huss, A. Bauder, M. Funk, and R. Hock, "A method to determine seasonal mass balances of Alpine glaciers since 1865", Workshop on mass balance measurements and modelling, Skeikampen, Norway, 26-28 March 2008.

A. Bauder and M. Huss, "Long term point observations of seasonal mass balance: a key to understanding 20th century climate change", Swiss Geoscience Meeting, Lugano, 21-23. November 2008.

Data books and reports

Herren, E. and Bauder, A. eds. (2008). The Swiss Glaciers 2001/02 and 2002/03. *Glaciological Report No. 123/124*, Cryouspheric Commission of the Swiss Academy of Sciences and the Laboratory of Hydraulics, Hydrology and Glaciology, ETH Zürich, 97p.

Public outreach

A. Bauder, "Gletscher: unberechenbare Zeitgenossen?", Tagung "Hallers Gletscher heute" zur Feier des 300. Geburtstags von Albrecht von Haller, Bern, 17. Oktober 2008.

A. Bauder, "Unterwegs mit einem Gletscherforscher", Volkshochschule Region Biel-Lyss, Lyss, 28. Oktober 2008.

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