

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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Glaciological investigations on the Grosser Aletschgletscher

Part of this programme:

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Swiss Glacier Monitoring (GLAMOS)

Project leader and team:

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Dr. Andreas Bauder, project leader  
2 field assistants, support of custodians

Project description:

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Long-term glacier observations have been carried out in order to document glacier variations of Grosser Aletschgletscher and include annual length change measurements since 1880, accumulation and mass balance measurements starting in 1918, and repeated map or aerial 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. 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 representing the surface topography.

Mass balance components with firn accumulation and ablation are measured in detail at Jungfraufirn. Seasonal observations at the end of winter and end of summer are performed. During winter, snow accumulation is the dominating process, while ablation of snow and ice occurs in the summer period. Thus, results from seasonal mass balance measurements allow to separate the processes of accumulation and ablation. On Jungfraufirn the last observation period was characterized by well above average amount of snow accumulation at the end of the winter period and a balanced summer season (see Figure 1). The summer season was split in two periods with only little melt during June and July and intense melt rates in August and September. In comparison of the past period with the conditions of the last decade, an above average accumulation resulted during the mass balance period 2015/16. The summer balance shows a higher inter annual variability than the winter balance. Thus the fluctuations in mass balance are mainly driven in variation in melt and confirm conclusions from previous studies.

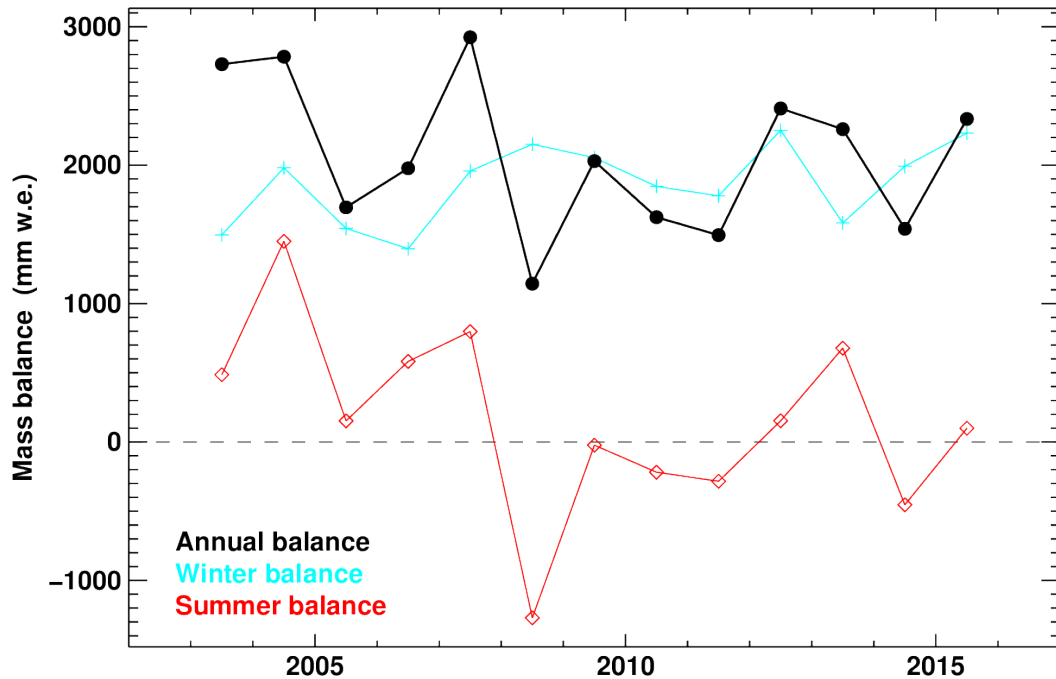


Figure 1. Winter, summer and annual mass balance (in millimeter water equivalents) at site P3 on Jungfrauoch since 2003.

Key words:

Glacier measurements, mass balance, snow and firn accumulation, ice melt

Internet data bases:

<http://www.glamos.ch>

Collaborating partners/networks:

Swiss Glacier Monitoring Network (GLAMOS)

Scientific publications and public outreach 2016:

**Data books and reports**

Bauder, A., eds., The Swiss Glaciers 2011/12 and 2012/13. Glaciological Report No. 133/134, Cryospheric Commission of the Swiss Academy of Sciences published by the Laboratory of Hydraulics, Hydrology and Glaciology (VAW), ETH Zürich, 118p., 2016.

Huss, M., A. Bauder, Ch. Marty, and J. Nötzli, Schnee, Gletscher und Permafrost 2014/15 - Neige, glaciers et pergélisol 2014/15 - Neve, ghiacciai e permafrost 2014/15. Die Alpen - Les Alpes - Le Alpi (Zeitschrift des Schweizer Alpen-Club), 7/2016, 36-43, 2016.

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