Name of research institute or organization:

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

Title of project:

Glaciological investigations on the Grosser Aletschgletscher

Part of this programme:

Swiss Glacier Monitoring (GLAMOS)

Project leader and team:

Dr. Andreas Bauder, project leader
2 field assistants, support of 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 of the entire glacier are calculated by comparison of digital elevation models. Mass balance components with firn accumulation and ablation are measured in detail at Jungfraufirn.

The last observation period was characterized by a slightly below average amount of snow accumulation at the end of the winter period (see Figure 1). Due to changing weather during the melt intense summer months July and August, without a stable and lasting warm period, moderate melt rates were observed. In total, the annual balance at the site near Jungfraujoch with a long series of measurements was the second most positive year of the last 10 years.

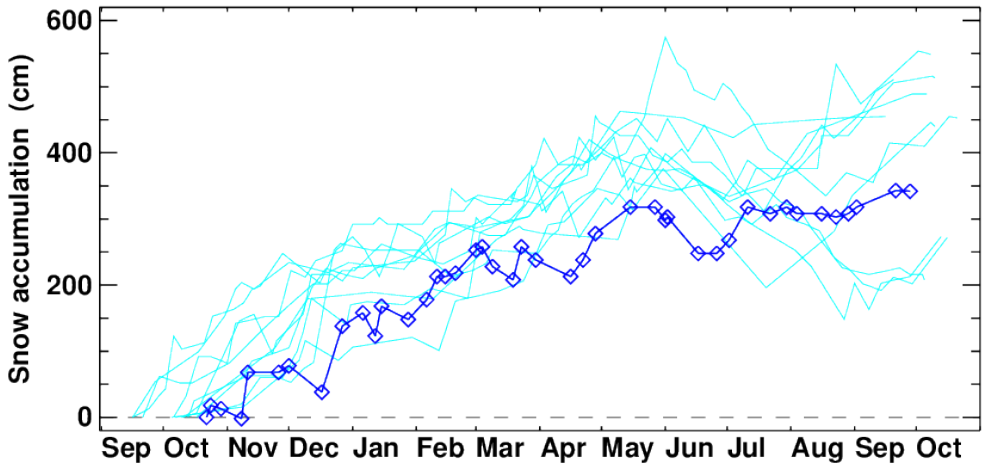

Figure 1. Evolution of the firn accumulation at site P3 on Jungfraufirn (3350 m asl) with comparison of the observation period 2013/14 with the past 10 periods. Displayed values are not corrected for density and homogenized start date of the periods.

Key words:

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

Internet data bases:

http://glaciology.ethz.ch/swiss-glaciers/

Collaborating partners/networks:

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

Scientific publications and public outreach 2014:

Refereed journal articles and their internet access

Kropáček , J., N. Neckel, and A. Bauder, Estimation of Mass Balance of the Grosser Aletschgletscher, Swiss Alps, from ICESat Laser Altimetry Data and Digital Elevation Models, Remote Sensing, **6**, 6, 5614-5632, doi: 10.3390/rs6065614, 2014.
http://www.mdpi.com/2072-4292/6/6/5614

Data books and reports

Bauder, A., S. Steffen and S. Usselmann, eds., The Swiss Glaciers 2007/08 and 2008/09, Glaciological Report No. 129/130, Cryospheric Commission of the Swiss Academy of Sciences published by the Laboratory of Hydraulics, Hydrology and Glaciology (VAW), ETH Zürich, 120p., 2014.

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