



ForumAlpinum'14

Plenary Session 2: The use of Alpine resources: from past to present

Concept Workshop 2.4: The recorded state and fate of Alpine glaciers in the archives of the Alpine Clubs

Wednesday, 17.09.2014, 16.00-18.00

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Moderation: Dr. Andrea Fischer, Austrian Academy of Sciences

The Alpine Clubs were founded at the end of the Little Ice Age. As one of the aims of the Alpine Clubs was the scientific exploration of the Alps, glacier advances and retreats have been recorded and published. The time series of length changes are among the longest time series on glacier fluctuations worldwide. Apart from length changes, maps, pictures and photographs represent a unique documentation of glacier changes, relevant for hydrological, climatological and ecological studies.

Inputs:

- Gebhard Bendler (OeAW, IGF, AT):
Documentation of glacier states in the archives of the Alpine Clubs
- Isabelle Gärtner-Roer, Samuel U. Nussbaumer, Michael Zemp (WGMS, CH):
Glacier length changes in the European Alps: available data and future challenges

History and recent challenges of glacier length change observations in the European Alps – examples from Switzerland

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Internationally coordinated monitoring of long-term glacier changes provide key indicator data about global climate change. The basic monitoring principles must be relevant, feasible, comprehensive and understandable to a wider scientific community as well as to policy makers and the general public. The latter is especially given by changes of glacier length and area, which represent an easily understandable, but delayed and filtered signal of regional climate fluctuations. The documentation of glacier length changes has developed from simple field surveys to sophisticated mapping using remote sensing data and GIS techniques. For some sites length changes have been reconstructed from well-dated historical evidence going back as far as the 16th century.

Front variation observations of around 1800 glaciers are available from the World Glacier Monitoring Service (WGMS) for most of the mountain ranges world-wide. In the European Alps, annual observations of glacier front variations started already in the second half of the 19th century, resulting in more than 680 data series, distributed over the entire Alpine mountain range. In this densely populated region, glaciers are a unique resource of freshwater for domestic, agricultural, and industrial use, an important economic component of tourism and hydro-electric power production, but also a source of natural hazards. The observations have mainly been conducted by the Alpine clubs, forest services, as well as by committed scientists and laypersons.

The front variations in the Alps show a general trend of glacier retreat over the past 150 years with intermittent minor glacier re-advances in the 1890s, 1920s, and 1970s-1980s. The recent strong retreat is associated with disintegrating glaciers, an increase in debris cover, and the development of glacier lakes in many places. Therefore, the position of the glacier front is sometimes hard to determine. A key challenge is to continue and extend the traditional observations in the approved networks including new measurement techniques, as well as to cope with the accelerated changes.