

Name of research institute or organization:

MeteoSwiss

Title of project:

The Weather Station of MeteoSwiss on Jungfrauoch

Project leader and team:

Dr. Rudolf Dössegger, project leader

Project description:

Since November 1922, MeteoSwiss has been operating a weather station on the Jungfrauoch for meteorological data collection and observation. The initial location near the railway terminal and the restaurant proved less than ideal, since the recorded data were influenced by the local environment. As soon as was possible the weather station was moved to the new Sphinx Observatory which was opened in 1938. Until 1980 the entire collection of data as well as all observations were made by observers, first by staff of the Jungfrau railway, later by caretakers of the research station. In 1980/81 the weather station on Jungfrauoch was automated and since then most of the data have been recorded and transferred automatically. However, this has not made the post of observer obsolete, since important data, such as cloud amount, cloud type and meteorological visibility cannot, to the present day, be measured by instruments.

The programme of recordings on Jungfrauoch comprises at present the following parameters:

Data type	Frequency of data collection	Means of recording
wind direction and speed	every 10 minutes	automatic
air temperature	every 10 minutes	automatic
humidity	every 10 minutes	automatic
atmospheric pressure	every 10 minutes	automatic
global radiation	every 10 minutes	automatic
duration of sunshine	every 10 minutes	automatic
luminance	every 10 minutes	automatic
lightning at close and distant range	every 10 minutes	automatic
radioactivity	every 10 minutes	automatic
cloud amount	at daytime every 3 hours	by observer
cloud type	at daytime every 3 hours	by observer
cloud below weather station	at daytime every 3 hours	by observer
meteorological visibility	at daytime every 3 hours	by observer
present weather phenomena	at daytime every 3 hours	by observer
past weather phenomena	at daytime every 3 hours	by observer
condition of ground	at daytime every 3 hours	by observer

The collection of data, however, has proved to be very difficult from the start. The fact that the station is built on an exposed, high alpine ridge, the often extreme temperatures and strong winds: all these factors have a greater or lesser impact on measurements. At certain times, measuring instruments have been covered in ice or hoarfrost and during these periods have not been able to provide any correct data, even though they have been constructed with a view to withstand such difficult conditions (e.g. with inbuilt heating system). Wind data are occasionally recorded incorrectly because of oblique upwinds or strong turbulent anomalies are registered.

It is due to these difficulties, especially in connection with extreme wind conditions, that MeteoSwiss has decided not to measure the following data on Jungfraujoch: amount of precipitation, increase of snow through recent snowfall, total snow depth.

A central computer at MeteoSwiss in Zurich retrieves the data transmitted every 10 minutes and transfers them to be processed in the usual way. On the one hand, data from Jungfraujoch along with those from other Swiss weather stations are transferred on-line to national and international users. On the other hand, they are fed into the data banks of MeteoSwiss where they are tested for plausibility and if necessary corrected/interpolated electronically or manually. This completed, they are compiled into daily, monthly, and annual datasets and can then be accessed by users, especially by research scientists.

In order to facilitate correct deductions from long-term data series in the field of climatology, MeteoSwiss has been carrying out research into the lack of homogeneity in a selection of data series. Under scrutiny were particularly irregular conditions due to a relocation of the weather station in question or to a change of instruments. If necessary, adjustments have been made.

The figures below show two examples of evaluation of the homogenous temperature series recorded on Jungfraujoch:

Fig.1: Temperature Jungfraujoch: annual mean temperatures 1961 to 2001

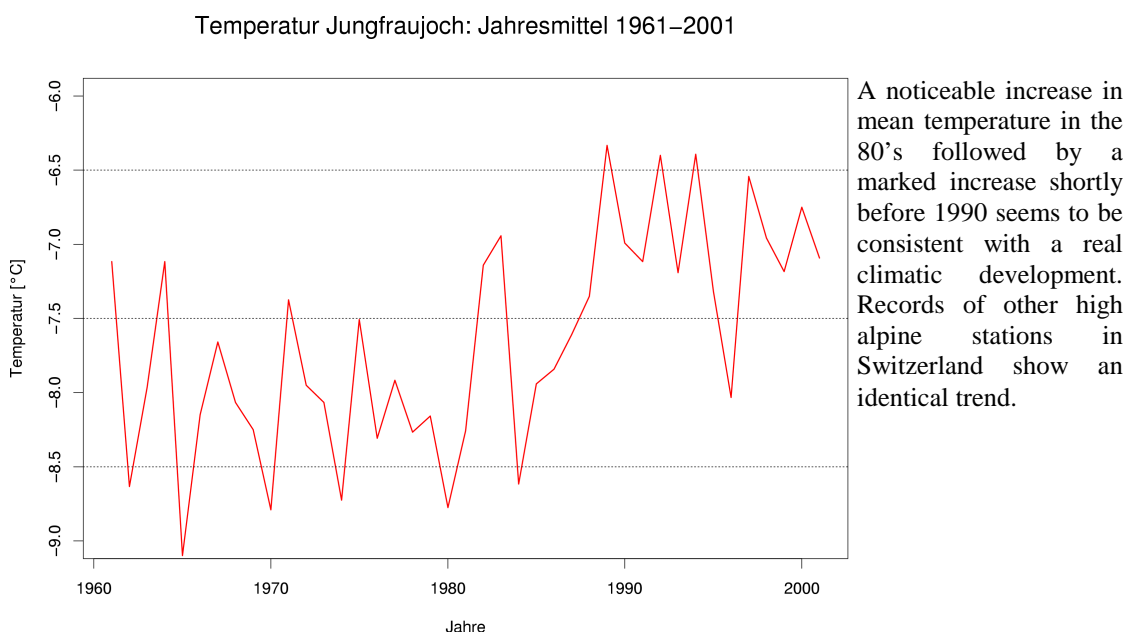
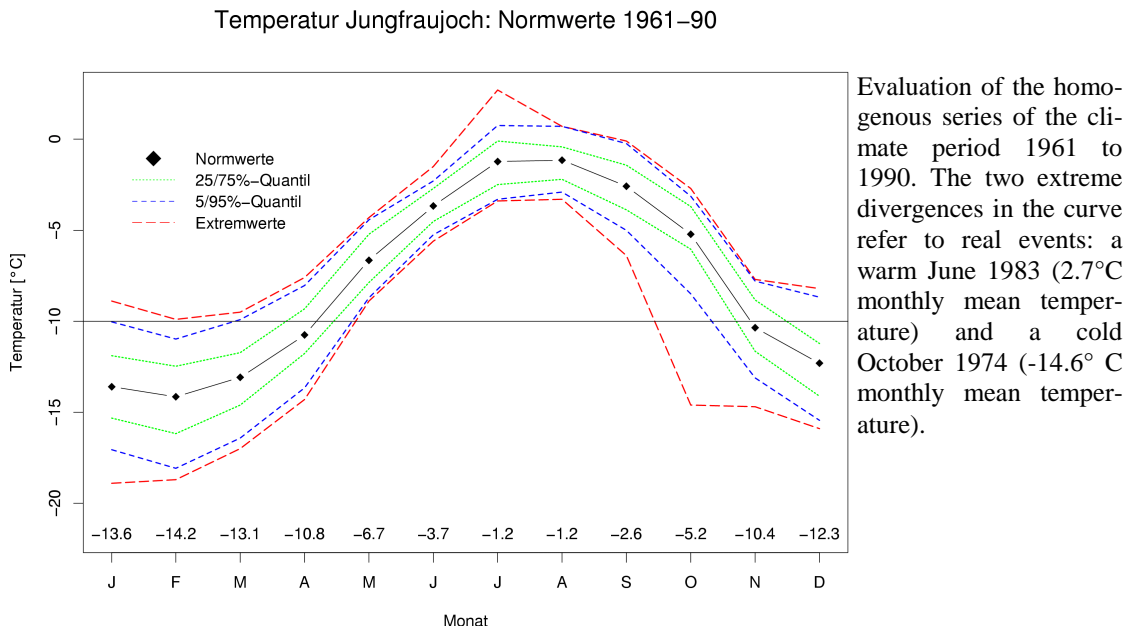


Fig.2: Temperatur Jungfrauoch: normal 1961 to 1990



Key words

Collaborating partners/networks:

Publications 2001:

Address:

MeteoSchweiz
Krähbühlstrasse 58
CH-8044 Zürich

Contacts:

Rudolf Dössegger Tel. +41 1 256 9423
e-mail: rudolf.doessegger@meteoschweiz.ch
URL: <http://www.meteoschweiz.ch/de/>