

Name of research institute or organization:

MeteoSwiss, Zürich

Title of project:

The weather in 2008

Report by:

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Project description:

The weather conditions during the first half of the year 2008 in Switzerland were determined by frequent foehn events and generally very mild temperatures. The summer 2008 was characterized by typical variable weather conditions, whereas above-average precipitation amounts were recorded. Wet and particularly cold conditions predominated the first weeks of autumn. After this period a mild and sunny Indian summer followed. Several cold air intrusions during the last weeks of autumn were responsible for an early snow cover even at low altitudes. Due to ongoing south currents considerable snow amounts were recorded at the alpine south side. However, the plains of the alpine north side were also hit by several snow events, bringing an early winter feeling to entire Switzerland.

Table 1 indicates the temperature surplus in 2008 compared to the long-term mean 1961-1990 in both the plains of the northern Alps and the high mountain areas. In Bern it was +0.8°C and at Jungfrauoch +1.1°C warmer than average. The precipitation amounts in 2008 were higher than normal at Jungfrauoch (110%) and below normal in Bern (92%).

Table 1: Comparison of temperature and precipitation in respect to the long-term mean 1961-1990 at the stations Jungfrauoch and Bern. Precipitation is expressed relative to the average amounts. Because precipitation is not measured at Jungfrauoch, values from Kleine Scheidegg have been used instead.

	Jungfrauoch	Bern
mean temperature	- 6.8 °C	+ 9.0 °C
deviation	+ 1.1 °C	+ 0.8 °C
precipitation	1733 mm	945 mm
relative to average	110 %	92 %

Stormy but mild beginning of the year – winter only in the Southern Alps

South foehn was predominant during the first part of January 2008. Between 3-5 January an exceptionally strong and sustaining foehn storm swept over the alps. Wind gusts exceeded 130 km/h and the temperature rose up to 12°C in typical foehn valleys. In contrast, the alpine south side experienced snow falls and typical winter conditions down to low altitudes. A second major south foehn event occurred on 10-11 January with wind gusts of the order of 100 to 120 km/h. This time temperatures climbed up to 16°C in typical foehn valleys, whereas again heavy snow fall events on

the alpine south side covered the entire region under a white blanket. A third foehn event occurred in the middle of the month.

Very mild and sunny end of the winter season

Starting with the second week in February a stable high pressure system established itself over Europe. Sunny and mild winter sport conditions prevailed for several days in the Swiss mountains, and at the end of the winter season the temperatures rose to spring-like conditions with anomalous high sunshine amounts. Between 23 - 26 February temperature maxima exceeded 13 to 18°C. Record breaking temperatures were even recorded regionally on 24 February in the northern Alps below 2000 m asl.

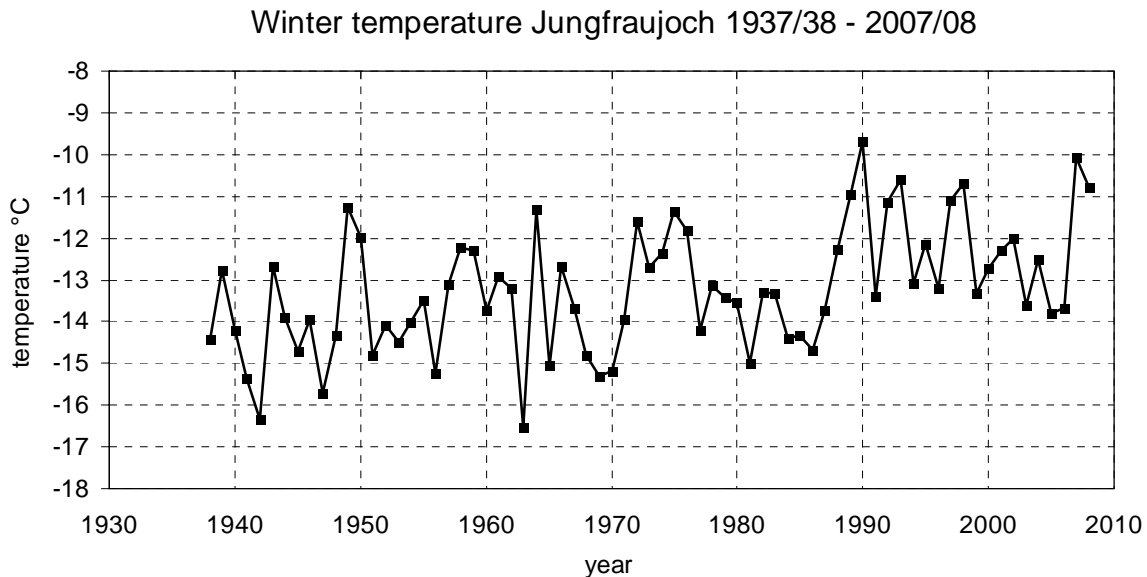


Figure 1: Winter temperatures (1937/38-2007/08) measured at the Jungfrauoch station (homogeneous dataset). The winter 2007/2008 (-10.8°C) indicates the fifth warmest winter during this measurement period.

Stormy spring

The transition between foehn and west storms started in March. Already on 1 March wind gusts from storm “Emma” blew at 130 km/h at low altitudes and 170 km/h in mountainous regions. Considerably lower wind speeds – in some alpine valleys as foehn – were recorded from the low pressure system “Johanna” on 10 March. The upcoming storm system on 12 March was called “Kirsten” and hit the plains of the alpine north side with wind gusts of 80 - 100 km/h, whereas mountainous regions registered wind speeds up to 150 km/h. And finally, the fourth major storm system “Melli” on 21 March brought wind speeds again up to 90 km/h at lower altitudes and about 150 km/h on alpine summits.

Late winter at low altitudes

Snow cover at low altitudes in Switzerland was rare during the winter season. The snow event on 5 March 2008 produced only 2 to 5 cm of fresh snow. However, over the Easter days between 21 to 24 March a typical winter feeling was experienced in many places, thanks to air masses of polar origin that produced intensive snow falls. Anomalous heavy snow falls were registered on Good Friday with up to half a meter of fresh snow in the Alps and in parts of the Valais of up to 80 cm.. Locally in the western part of Switzerland 20 cm of fresh snow fell. On Easter Monday, 24 March

2008, again 2 - 20 cm of fresh snow was measured in the plains of the northern Alps. However, the increased radiance of the spring sun caused the snow in low altitudes to disappear shortly thereafter.

Heavy foehn event and a warm end of spring

The sequence of serious foehn events at the beginning of spring ended with an uncommonly severe foehn storm. The highest wind gust ever measured in May since 1981 was recorded on 27 May at Gütsch above Andermatt (2287 m asl) with 180 km/h. During the night of 28 May the foehn blew along the typical foehn valleys and advanced far in the plains of Switzerland. Glarus recorded 136 km/h, a speed that has hardly been reached during the last 40 years during a foehn event. The highest wind gust ever since 1992 was measured in Brienz with 132 km/h. In addition to the strong wind, large amounts of Saharan dust were transported into Switzerland and temperatures increased accordingly. Locally the value of 30°C was exceeded on 27 - 29 May 2008, which represents new May records for some stations.

A variable Summer

The months June to August were variable with typical summer conditions only during the last third of the period. Consecutive heavy thunderstorm events in July were responsible for considerable precipitation amounts in large parts of the Alps and the southern Ticino. In principle, the variable weather during summer is a typical characteristic for summers in Middle-Europe, and the alpine north side and hence the summer 2008 can be described as “normal” summer. In summary the summer 2008 was warmer than the 1961-1990 average, and the precipitation amounts reached above-average values in many parts of Switzerland.

As in 2007 a golden autumn and early winter

After a relatively long and cold phase in September with wet conditions in the west and south, October was characterized by a gorgeous Indian summer as in 2007. In the plains of the north and south side of the Alps the temperatures rose again up to 20°C, and in altitudes of 1500 m asl they reached 15°C.

The first real and strong harbinger of winter hit Switzerland during the last days in October. Intensive precipitation between the 29 and 30 October was responsible for considerable fresh snow amounts on the plains of the alpine north side and the Alps. In the area between Berne and Lake Constance station measurements reached 2 – 10 cm of fresh snow, locally even 20 cm. In central Switzerland snow amounts locally reached the record amounts for October from 20 to almost 50 cm.

Large snow amount on the alpine south side

Winter didn't stop in the following weeks, and by 21 November cold polar air reached the alpine north side. The plains received again several centimeters of fresh snow, whereas on higher altitudes 40 - 80 cm was not unusual. After this event, snowfall moved into the alpine south side. At the end of November and beginning of December a persistent south current covered the Ticino with enormous snow amounts. On 29 November Locarno Monti (367 m asl) registered with 12 cm the second largest fresh snow amount in November since 1931. The upper part of the Engadin got more than one meter of fresh snow, which was a very rare event and for some stations a new record for this time of the season.

Additional snow events on the plains of the alpine north side were recorded on 9 – 10 December and 17 December with focus in both cases in the region of Berne-Freiburg.

The total amount of snow in Berne with 38 cm and 18 December set a new record for December since measurement began in 1931. However, most of the snow melted away before Christmas in most parts of the Swiss plains. Mountainous regions on the other hand celebrated perfect Christmas holidays with above-average snow amounts and sunny weather conditions.

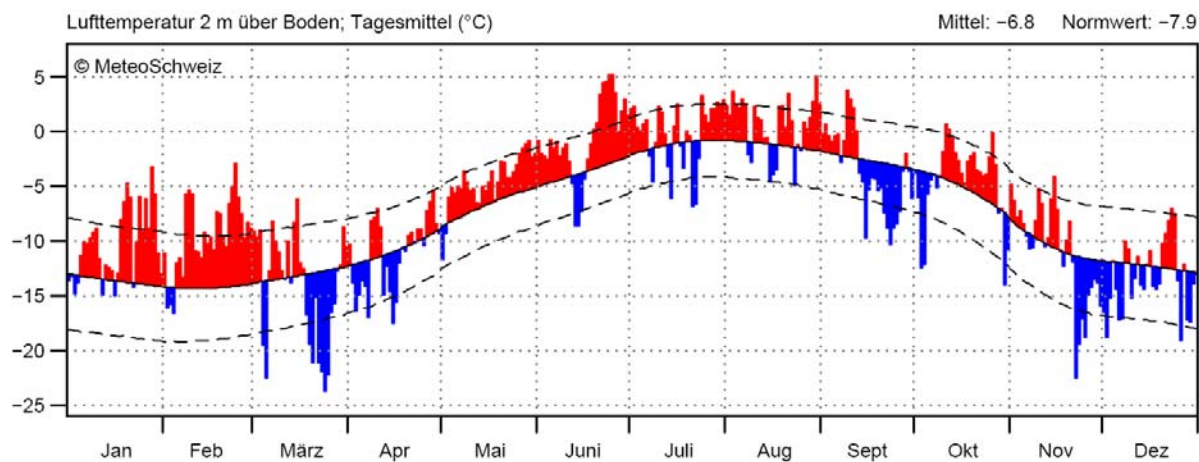


Figure 2: Time series of the daily mean temperatures in 2008 measured at the station Jungfrauoch. Color bars represent anomalies in respect to the long-term mean 1961-1990 and red indicates positive and blue negative anomalies. The dashed lines represent the standard deviation.

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