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The weather in 2013

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The annual mean temperature 2013 in Switzerland just corresponded with the norm value 1981–2010. Annual precipitation was slightly above the norm. The year 2013 was characterized by persistent wintery conditions until the end of April and a record lack of sunshine from January to May. An extremely sunny summer compensated for the grey start of the year. As early as mid-October winter had its comeback with unseasonably large amounts of fresh snow in the Eastern Alps. Since there was no substantial snowfall after that, extended areas of the mountains recorded a below-average snow cover at the start of proper winter. The northern lowland regions enjoyed an unusually sunny early winter thanks to a lack of fog. Shortly before the end of the year record amounts of fresh snow fell south of the Alps.

As can be seen in table 1 below, the year 2013 was close to the norm value 1981–2010 (reference period), with a small deviation both in the lowland regions north of the Alps and in the high Alpine regions. Precipitation totals reached 105 percent of the normal values both in the Jungfrau region and in the lowland regions north of the Alps.

Table 1: Annual values 2013 referring to the parameters temperature and precipitation as well as the deviations from the reference period 1981–2010 for the stations Jungfraujoch and Berne. As precipitation is not measured at Jungfraujoch the values pertaining to the Kleine Scheidegg are used here.

	<i>Jungfraujoch</i>	<i>Berne</i>
Average temperature	-7.3 °C	8.7 °C
Deviation	-0.2 °C	-0.1 °C
Precipitation	1706 mm	1113 mm
Deviation	105 %	105 %

Spring-like beginning of the year south of the Alps

In the first half of January 2013 the mild winter weather that had prevailed since mid-December 2012 continued. Under the influence of a north “Foehn” situation winter even turned into spring south of the Alps. On 5 January the temperature in Lugano rose to 22.3°C and in Locarno-Monti to 22.6°C. This was the third-highest January value for Lugano and the second-highest value for Locarno-Monti since observations started. The second half of January provided cool temperatures in line with the season and some occasional snowfall. The change into February brought on another mild, spring-like spell with plenty of sunshine and temperatures up to 13°C in the north, up to 17°C in the south.

Comeback of winter in February

In the first week of February the influx of mild and humid air brought at first a considerable amount of fresh snow in the mountains. The precipitation was accompanied by strong westerly winds with gusts of up to 100 km/h on the Swiss Plateau and 130 km/h in peak areas. Colder air masses with further snowfall finally also laid down a snow cover on the Swiss Plateau. From 10 to 12 February this snow cover attained a depth of 21 cm in Geneva, leading to the temporary closure of the Geneva-Cointrin airport. There was even some snowfall in the Ticino, resulting in a white landscape covering the whole of Switzerland on the morning of 12 February. In the southern Ticino there was an unusual amount of fresh snow towards the end of the month when up to half a meter fell in a short time in the night of 24/25 February. At the same time an icy wind blew in northern Switzerland, bringing with it below-zero temperatures all day long.

Very cold winter in the high mountains

While in the meteorological winter 2012/2013 (December to February) temperatures observed in the northern lowland regions were within the norm 1981-2010 and slightly above the norm in southern regions, winter temperatures in the high mountains were substantially below the norm. At Jungfraujoch (3580 m a.s.l.) the coldest winter for over 40 years was recorded with an average temperature of minus 15.6°C. Only in the winters of 1968/69 und 1969/70 were similarly cold conditions last observed.

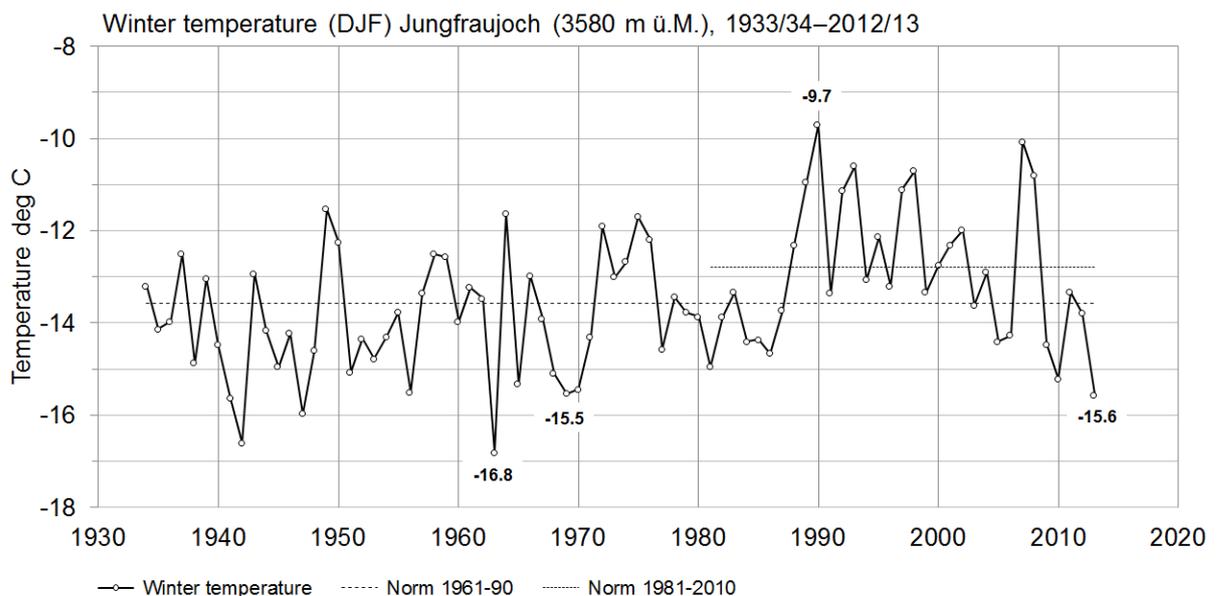


Figure 1: Winter temperatures from 1933/34 to 2012/13 at the Jungfraujoch measurement station (homogeneous data).

Continued wintery

After some milder days at the beginning of March, supported by a strong “Foehn” in the north, mid-March presented itself again in wintery fashion. An influx of arctic air from the north-east triggered repeated snow showers down to low altitudes, and in the high valleys minimum temperatures sank to around minus 20°C, at Jungfraujoch to almost minus 29°C. When the winds changed to a south-westerly direction shortly after the middle of the month there was again snowfall of up to 20 cm in the lower regions of the Ticino, up to 50 cm in certain regions above 800 m a.s.l. Thereafter, the weather remained typical for late winter until the first April days, with some March snow down to the lower northern regions and overall conditions which were too cool for the season, with a considerable lack of sunshine.

After a short period of early summer another spell of winter

In mid-April warm early-summer air arrived in Switzerland with south-westerly winds and in many places temperatures rose to over 23°C, locally even over 25°C and over 28°C in the Valais. Already on 20 April, however, values were often significantly under 10°C. Substantial precipitation brought some fresh snow to the lower regions of northern Switzerland, in higher altitudes 15 to 20 cm, in the Alps 40 to 75 cm, locally even up to 90 cm. In the Ticino precipitation with accompanying thunderstorms amounted to 160 mm.

Extreme precipitation

A severe precipitation event hit the Ticino from 26 to 30 April. The highest amounts fell in the Maggia region with 300 to 400 mm. Here far more than the normal April precipitation total fell within 5 days.

On the evening of 2 May a thunderstorm with record precipitation hit Schaffhausen – an event of a magnitude that is to be expected only every 50 to 100 years. Within 10 minutes 32.8 mm of rain fell in the town at the Rhine Falls, resulting in severe flooding. The Schaffhausen record rainfall came second in the list of the most intense short-term rain events in Switzerland. The Swiss record is held by Locarno-Monti in the Ticino with a ten-minute total of 33.6 mm (29 August 2003).

As a consequence of air masses being blocked in the south there was again heavy rain south of the Alps from 14 to 21 May. From the Simplon region to the Bregaglia around 150 to 270 mm fell within eight days. The Maggia region received again the highest amount of precipitation, locally up to 370 mm. The quantity of water caused flooding at the Lago Maggiore and mudslides made roads and railway tracks impassable.

At the end of May humid Mediterranean air arrived north of the Alps via the Austrian Alps. From 31 May to the morning of 2 June precipitation amounted to 80 to 150 mm on the central and north-eastern slopes of the Alps and, in a corridor from the Schwyzer Alps to the frontal region of Appenzell, even 150 to over 200 mm. In quite an extensive area around the Säntis precipitation 2-day totals attained new record values. The weather station at Teufen (where observations started in 1901) recorded 191 mm, beating the former record of 177 mm (30.5.1940) by far.

Record lack of sunshine

In the region from Basel via Zurich to St. Gallen the persistent lack of sunshine from the beginning of the year resulted in the most sun-deprived January-to-May period in the measurement series of homogenized data since 1959; in the long Zurich measurement series the most sun-deprived period since observations started in 1884. Here the record lack of sunshine also applies to spring (March to May). In most of the other areas it was the January-to-May period with the least sunshine and the spring with the least sunshine since the 1980s.

Short heat wave in June

At the beginning of June a period of several days with sunny weather established itself, for the first time since mid-April. The weather then continued unsettled until mid-June. From 16 to 19 June it was summery and hot. In the lower regions temperatures attained maxima of 31 to 36°C and some stations observed new record values for the month of June.

On 20 June a severe front with thunderstorms, hail and strong gusts of wind in western Switzerland put a temporary end to the summery conditions. In Biel the strong storm gusts caused chaos and destruction on the premises of the Federal Gymnastics Festival; many persons were injured, some severely. This happened after heavy downslope winds from the Jura had caused damage on the festival premises only the week before.

Extremely sunny high summer

The almost unbroken sunny high-summer weather in July and August provided welcome compensation for the unusually grey weather of the period before. On the Swiss Plateau the summer of 2013 thus established itself as the third- or second-sunniest in relation to the period of homogenized data since 1959. Considerably more sunshine was registered in the summer of 2003. Looking back further in the long Zurich sun measurement series, only the summer of 1911 yielded more sunshine hours than the two summers of 2013 und 2003.

Distinctive beginning of autumn

In the first September days temperatures on both sides of the Alps rose once more to high-summer values between 26 and 30°C, locally even higher in the north. The station at Genève-Cointrin recorded 30.1°C, the first September heat-day since 1987.

Towards mid-September Switzerland was seized by cool polar air. The snow line descended to 1100 m a.s.l. and westerly storm winds accompanied by heavy rain caused the first autumn leaves to fall. In the second half of the month the first patches of autumnal fog occurred in the lower regions of the north while mild conditions prevailed in the Alps, enabling splendid, clear views.

Strong wintery intermezzo

Shortly before the middle of October a second forceful advance of polar air caused the snow line to drop to 600 m on both sides of the Alps and even in low areas temperatures remained as low as 10 to 12°C. In the Eastern Alps above 1000 m a.s.l. there was up to half a meter of fresh snow. Certain regions recorded the largest amount of fresh snow in the first half of October since observations started. This wintery intermezzo was followed by a very mild second half of the month, resulting in the fourth-warmest October since observations began in 1864.

Classic late autumn

The first third of November brought wet and stormy westerly weather and temperatures remained very mild. In the night from 6 to 7 November Neuchâtel experienced its mildest November night in 20 years with a minimum temperature of 12.2°C.

From 11 November onward calm high-pressure situations were the dominating weather element until deep into December; first in a classic constellation with sunshine in the mountains and fog in the low areas. However, from the beginning of December even the low areas were free of fog and it was unusually sunny in many places thanks to extremely dry cold air.

The calm autumn weather was interrupted by a precipitation phase around 20 November which lasted several days and brought the first fresh snow to the region north of the Alps down to the lower areas. Towards the end of November there was again some fresh snow in the same areas. During the cyclone „Xaver“ from 5 and 6 December which was mainly active over northern Europe wind speeds in peak areas reached over 130 km/h, while in the northern lowland areas the highest values amounted to slightly over 70 km/h.

Weather records in December

The influence of a persistent high-pressure area and a regional scarcity of fog unusual for the Plateau during the first half of December led to a December sunshine record mainly on the central and eastern Plateau. In certain regions the sun shone from the December sky for 80–120 hours instead of the normal duration of 30–50 hours.

Over the Christmas period an uncommonly violent Foehn storm hit the Alps. At the Alpine Foehn station Gütisch above Andermatt (2287 m a.s.l.) in the Gotthard region wind peaks of 208 km/h were registered, which means that it was the third-strongest Foehn storm recorded

since observations started in 1981. Chur experienced the second-strongest Foehn storm since observations started in 1981 with wind values peaking at 110 km/h.

During the intensive influx of air from the south which also caused the Christmas Foehn storm extraordinary amounts of snow fell south of the Alps. Within one day fresh snow totals amounted to between 80 and 120 cm at altitudes above 1500 m a.s.l. At the weather station Bosco-Gurin (1505 m a.s.l.) in the Ticino a fresh snowfall of 110 cm represented a new record in the measurement series stretching back over 50 years. Also at San Bernardino (1639 m a.s.l.) in the Mesocco Valley (Grisons) a record amount of 120 cm of fresh snow was registered. Here the measurement series dates back over 60 years. The previous record from the years 1955 and 1978 was 95 cm - a significantly lower value.

Annual balance

Looking at Switzerland as a whole, the annual mean temperature just corresponded with the norm value 1981–2010. In the year 2013 temperatures north of the Alps and along the northern slopes of the Alps were mostly 0.1 to 0.4°C below the norm. In the Valais, in the Grisons and in the Ticino annual mean temperatures turned out to be close to the norm, with deviations of between -0.1 and +0.3°C.

In many parts the annual precipitation totals attained 90 to 110 percent of the norm 1981–2010. On the northern slopes of the Alps they amounted locally only to 80 percent and in the Engadine locally even below 80 percent of the norm.

There were no regional differences in relation to sunshine duration. In the entire country values mostly amounted to between 90 and 100 percent of the norm 1981–2010. After the extremely grey first part of the year it was above all the very sunny summer that managed to raise sunshine duration to an almost normal level.

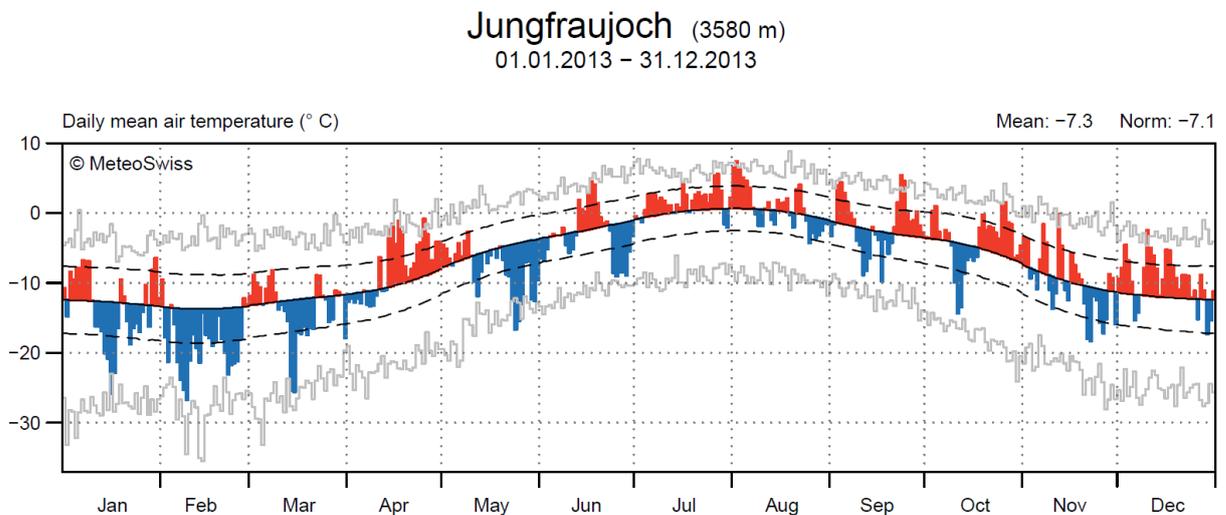


Figure 2: Development of the 24-hour mean temperatures 2013 at the station Jungfrauoch, in relation to the long-term mean value 1981–2010 (unbroken line) and the long-term mean fluctuation (broken line, standard deviation). The two grey curves show the highest and the lowest 24-hour mean temperatures since observations started.

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