



Monthly Climate Report

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Weather in retrospect for September 2024

September 2024: The wettest September in recorded history

At the beginning of September 2024, a heat wave that had lasted around two weeks in most of Austria ended, in some places in eastern Austria for over four weeks. New September high temperatures were reached at many weather stations. At 35.9 °C in Bad Deutsch-Altenburg on September 3, the existing record for September was missed by 0.1 °C.

September records for daily and multi-day

rainfall An incursion of cold air in the second week of September brought very large amounts of rain with intense low pressure activity between September 11 and 17. In most of Austria it rained 100 to 200 millimeters, in parts of Lower Austria, Vienna and Upper Austria in some places even 250 to just over 400 millimeters. That is about three to four times the amount of an average September. New records for daily and multi-day rainfall were measured at many weather stations. Floods and mudslides were the result.

The wettest September in recorded history

The heavy rain in mid-September also brought new September records for monthly precipitation at over 80 weather stations. For example, in St. Pölten and Langenlebar (N) with 447 millimeters each. The previous September precipitation record was 202 millimeters in St. Pölten (1937) and 175 millimeters in Langenlebar (2014). The Austria-wide evaluation also saw a new September record with an increase of 118% (old record +111%, September 1899).

Snow in some valleys

The incursion of cold air also brought snow in many valleys. For example, in Hall near Admont (St, 637 m) there was a 5 cm thick layer of snow on September 13th. Snow below 1000 m above sea level occurs in Austria in September about every five years. The amount of snow on the mountains was very unusual and in some places even brought new records, such as on the Rudolfshütte (S, 2320 m above sea level) with 145 cm on September 17th.

Average to slightly above-average monthly mean temperature

The unusual heat at the beginning of September, followed by a very cold middle of the month and an average end of the month, resulted in average to slightly above-average temperature conditions overall. September 2024 was 0.7 degrees above the average for the climate period 1991 to 2020 in the lowlands of Austria, and 0.1 °C below in the summit regions.

September 2024 in detail

Temperature

The unusually low temperatures during the rainy phase and a subsequent relatively average second half of September almost make you forget that the first eight days of September 2024 were extremely hot. The temperature level during the first eight days of the month was on average 6 °C above the 1991-2020 climate average. The heat wave, which began in many places in August, lasted around 10 to 15 days in the west and south of the country and mostly 13 to 31 days in the north, east and southeast. It ended around September 9 and was, especially in the east of the country, one of the longest in Austria's recorded history.

New records for maximum air temperatures were set in many places. In Bad Deutsch-Altenburg (N, 169 m), the Austrian record from 2015 (Pottschach 36.0 °C, September 1, 2015) was only just missed on September 3 with 35.9 °C. New station records were recorded at around 30 other weather stations.

The hot summer conditions changed abruptly. While the daily highs on September 8th were around 31 °C, five days later they only reached 9 °C. Daily highs below 9 °C below 500 m above sea level are not uncommon for September. However, it was exceptionally cold for the first half of the month and across the region. From the 12th to the 17th, it was an average of 6.2 °C too cold in Austria. After the middle of the month, temperature conditions typical for the time of year set in and September was overall just a little too warm. On average, the HISTALP lowland stations showed a deviation from the average of 91-20 +0.7 °C. In the summit regions it was slightly cooler than average for the first time since November 2023 (deviation -0.1 °C). In Vorarlberg, Tyrol, Salzburg, Upper Austria and the Austrian

Alps, it was slightly cooler than average for the first time since November 2023 (deviation -0.1 °C).

In the Salzkammergut and parts of Upper Styria, temperature anomalies were between -0.7 and +0.5 °C. In the other federal states, September was 0.5 to 1.5 °C warmer than the long-term average. In parts of the Mühlviertel and Waldviertel as well as in the Weinviertel, temperature deviations reached values between +1.5 and +2.1 °C.

Climatological classification of air temperature - September 2024

(HISTALP data set)

Lowlands:

Deviation from the average 1961-1990: +1.1 °C

Deviation from the average 1991-2020: +0.7 °C

Rank: 1

Summit regions:

Deviation from the average 1961-1990: -0.1 °C

Deviation from the average 1991-2020: -0.1 °C

Rank: 1

Extreme values of air temperature in September 2024

Highest air temperature: Bad Deutsch-Altenburg (N, 169 m) 35.9 °C on September 3rd

Lowest air temperature (mountains): Brunnenkogel (T, 3437 m) -13.7 °C on September 29th

Lowest air temperature inhabited place: Liebenau (O, 845 m) -2.9 °C on September 30th

Lowest air temperature below 1,000 m: Liebenau (O, 845 m) -2.9 °C on September 30th

Air temperature from selected weather stations in September 2024

(monthly average and deviation from the average 1991-2020)

Galzig (T, 2079 m) 5.6 °C Variant -0.7 °C

Rudolfshütte (S, 2317 m) 4.0 °C Variant -0.6 °C

Patscherkofel (T, 2251 m) 4.7 °C Variant -0.6 °C
Litschau (N, 558 m) 14.4 °C Variant +2.1 °C
Laa/Thaya (N, 184 m) 17.1 °C Variant +2.1 °C
Poysdorf (N, 198 m) 16.9 °C Variant +1.9 °C

Precipitation

After a hot and dry August, a marked change in air masses in the second week of September brought a sudden transition from midsummer to autumn. This change in air masses brought low pressure systems to Central Europe for the first time in several weeks, which in turn brought widespread precipitation. The low pressure system that determined the weather in Central Europe from September 12 to 16 brought enormous amounts of precipitation north of the main Alpine ridge, particularly from Salzburg to northern Burgenland, the likes of which have rarely or never been seen here. During these five days, an average of 221 mm of precipitation fell in Upper Austria, 212 mm in Lower Austria, and 196 mm in Vienna. This corresponds to 2.7 times, 3.6 times and 4.2 times the amount that falls in these federal states in an average September. The largest five-day totals fell in Lower Austria, south of the Danube from the Eisenwurzen to the Semmering and up to the Tulln Basin. In these areas, 270 to 420 mm of precipitation fell.

This rainfall event in mid-September exceeded the old monthly records at 85 GeoSphere Austria weather stations, which have a time series length of at least 20 years. In some places, such as Langenlebern (447 mm), by 2.5 times.

The evaluation of GeoSphere Austria's HISTALP stations shows a precipitation deviation for September 2024 of +118% for the whole of Austria. This makes it the wettest September in the history of precipitation measurements in Austria (measurements began in 1858, HISTALP data set). The previous record of +111% was held by September 1899. In the HISTALP region North (region north of the imaginary line Salzburg – Mattersburg) the increase in precipitation reached an average of 243%. But in Vorarlberg and North Tyrol (+68%) it was also the wettest September since 1984.

There are large spatial differences in precipitation anomalies. In Vorarlberg and in the southern parts of the Tyrolean Oberland, 25 to 75% more precipitation was recorded than in an average September. The same was true in parts of East Tyrol and Upper Carinthia, as well as in Pongau and Lungau, Lower Carinthia and western Styria. In the remaining regions of Tyrol and the parts of the country south of the Flachgau – Central Burgenland line, 75 to 125% more precipitation fell than average. In Flachgau, southern Upper Austria, the Hochschwab area and upper Mürztal, as well as in the southern Vienna Basin, in the Bucklige Welt and in parts of northern and central Burgenland, the anomalies reached +125 to +175%. A precipitation surplus of at least 175% was observed in Upper Austria north of the Alps, in large parts of Lower Austria, in Vienna and partly in northern Burgenland. Upper Austria along and north of the Danube, the Waldviertel and Weinviertel, Vienna and the northern Mostviertel and Industrieviertel were the regions where the rainfall was most unusual. Precipitation deviations of +225 to +325% were measured here, but in some places, such as St. Pölten and Langenlebern, 525 to 555% more rain fell than in an average September. In absolute terms, St. Pölten had 447 mm instead of 72 mm and Langenlebern also had 447 mm instead of 68 mm.

With the advance of cold air, the snow line fell to 800 to 1200 m above sea level. In some Alpine valleys, the intense rainfall caused the snow line to drop even further. The lowest weather station where a measurable snow cover was still recorded was Hall near Admont (St, 637 m, 5 cm). The heaviest snowfall was in the northern Limestone Alps from Salzburg to Lower Austria. On the Feuerkogel, the old September record for the highest snow cover from 1931 was exceeded by 10 cm at 90 cm. In Ramsau (St, 1207 m) it was 19 cm instead of 15 cm (Sept. 2020). With the rising temperatures after the event, the snow cover quickly deteriorated again, especially below 2500 m, and even on the Rudolfshütte, which had also set a snow depth record for September with 145 cm, only a 9 cm thick snow cover remained at the end of the month.

Extreme precipitation values in September 2024

(monthly total and deviation from the 1991-2020 average)

rainiest place: Rudolfshütte (S, 2317 m) 510 mm dev. 151%

rainiest place: Nauders (T, 1330 m) 72 mm dev. 13%

Precipitation total from selected weather stations in September 2024

(monthly total and deviation from the average 1991-2020)

Langenlebarn (N, 175 m) 447 mm dev. 555%

St. Pölten (N, 274 m) 447 mm dev. 525%

Langenlois (N, 207 m) 253 mm dev. 411%

Galtür (T, 1587 m) 105 mm deviation 11%

Nauders (T, 1330 m) 72 mm deviation 13%

Pitztal Glacier (T, 2864 m) 132 mm deviation 22%

Sun

The sun appeared 9% less often than the climate average for the reference period 1991-2020. Along the northern edge of the Alps and north of it, as well as in Eastern Styria and Burgenland, the sunshine conditions were balanced with deviations of -10 to +10%. Further south and west, the sun shone for significantly less time than in an average September. The anomalies to the climate average here were generally between -10 and -30%. In East Tyrol, Upper Carinthia and the Upper Mur Valley, it was particularly cloudy for a September, with deficits of -30 to -44%.

The sunniest places in September 2024

(monthly total and deviation from the average 1991-2020)

Below 1,000 m above sea level: Podersdorf (B, 116 m) 211 h variance n/a

Above 1,000 m above sea level: Loferer Alm (S, 1,619 m) 158 h variance -3%

Duration of sunshine from selected weather stations in September 2024

(monthly total and deviation from the average 1991-2020)

Wels (O, 309 m) 181 h variance 10%

Litschau (N, 558 m) 166 h variance 9%

Hörsching (O, 298 m) 185 h variance 9%

Sonnblick (S, 3,109 m) 86 h variance -44%

Mariapfarr (S, 1151 m) 90 h devi. -43%

Obervellach (K, 688 m) 102 h devi. -41%

September 2024: Overview of federal states

Vorarlberg

Precipitation deviation: 58%

Temperature deviation: +0.1 °C

Deviation in sunshine duration: -13%

Highest temperature: Feldkirch (438 m) 30.6 °C on September 7th

Lowest temperature (summit/high alpine): Lech (1442 m) -1.0 °C on September 18th

Lowest temperature below 1000 m: Gaschurn (985 m) 0.9 °C on September 15th

Highest monthly average air temperature: Rohrspitz (395 m) 15.0 °C, deviation n/a

Highest sunshine duration: Feldkirch (438 m) 166 h, deviation -6%

Tyrol

Precipitation deviation: 70%

Temperature deviation: +0.1 °C

Deviation in sunshine duration: -23%

Highest temperature: Innsbruck-Uni. (578 m) 31.4 °C on September 4th

Lowest temperature (summit/high alpine): Brunnenkogel (3437 m) -13.7 °C on September 29th

Lowest temperature below 1000 m: Hochfilzen (962 m) -0.3 °C on September 14th
Highest monthly average air temperature: Innsbruck-Uni. (578 m) 15.1 °C, variance +0.5 °C
Highest sunshine duration: Kössen (588 m) 169 h, variance n/a

Salzburg

precipitation deviation: 89%
Temperature deviation: +0.1 °C
Deviation in sunshine duration: -17%
Highest temperature: Bischofshofen (550 m) 30.4 °C on September 4th
Lowest temperature (summit/high alpine): Sonnblick (3109 m) -9.2 °C on September 15th
Lowest temperature below 1000 m: Rauris (934 m) 0.3 °C on September 13th
Highest monthly average air temperature: Salzburg Airport (430 m) 14.8 °C, deviation +0.5 °C
Highest sunshine duration: Salzburg Airport (430 m) 186 h, deviation n/a

Upper Austria

precipitation deviation: 204%
Temperature deviation: +1.1 °C
Deviation in sunshine duration: 2%
Highest temperature: Enns (317 m) 33.9 °C on September 4th
Lowest temperature (summit/high alpine): Dachstein Glacier (2520 m) -6.9 °C on September 29th
Lowest temperature below 1000 m: Liebenau (845 m) -2.9 °C on September 30th
Highest monthly average air temperature: Linz (262 m) 16.8 °C, deviation +1.8 °C
highest sunshine duration: Aspach (427 m) 189 h, variance +8 %

Lower Austria

precipitation deviation: 255%
temperature deviation: +1.4 °C
deviation in sunshine duration: -4%
highest temperature: B. Deutsch-Altenburg (169 m) 35.9 °C on 3.9.
lowest temperature (summit/high alpine): Rax/Seilbahn (1547 m) -2.1 °C on 13.9.
lowest temperature below 1000 m: Schwarza/Freiwald (788 m) -2.7 °C on 30.9.
highest monthly average air temperature: B. Deutsch-Altenburg (169 m) 17.7 °C, variance n/a
highest sunshine duration: Schwechat (183 m) 200 h, variance n/a

Vienna

precipitation deviation: 290%
temperature deviation: +1.3 °C
Deviation in sunshine duration: -2%
Maximum temperature: Vienna-Stammersdorf (191 m) 34.7 °C on 3.9.
Minimum temperature (summit/high alpine): Vienna-Jubiläumswarte (450 m) 4.7 °C on 13.9.
Minimum temperature below 1000 m: Vienna-Mariabrunn (225 m) 2.0 °C on 30.9.
Highest monthly average air temperature: Vienna-Innere Stadt (177 m) 18.5 °C, deviation +1.3 °C
Highest sunshine duration: Vienna-Stammersdorf (191 m) 194 h, deviation n/a

Burgenland

Precipitation deviation: 133%
Temperature deviation: +1.3 °C
Deviation in sunshine duration: 0%
Maximum temperature: Andau (117 m) 35.3 °C on 2.9.
Lowest temperature: Kroisegg (444 m) 0.8 °C on September 30th
Highest monthly average air temperature: Podersdorf (116 m) 17.5 °C, deviation n/a
Highest duration of sunshine: Podersdorf (116 m) 211 h, deviation n/a

Styria

precipitation deviation: 94%
Temperature deviation: +0.7 °C
Deviation in duration of sunshine: -16%

Highest temperature: Fürstenfeld (271 m) 34.2 °C on September 4th
Lowest temperature (summit/high alpine): Schöckl (1443 m) -0.9 °C on September 13th
Lowest temperature below 1000 m: Mariazell (864 m) -1.3 °C on September 30th
Highest monthly average air temperature: Bad Radkersburg (207 m) 16.8 °C, deviation +1.6 °C
highest sunshine duration: Bad Radkersburg (207 m) 184 h, variance +1 %

Carinthia

precipitation deviation: 74%
temperature deviation: +0.8 °C
deviation in sunshine duration: -28%
highest temperature: St.Andrä/Lavanttal (403 m) 32.8 °C on 4 September
lowest temperature (summit/high alpine): Villacher Alpe (2117 m) -3.9 °C on 13 September
lowest temperature below 1000 m: Kornat (990 m) -0.2 °C on 13 September
highest monthly average air temperature: Klagenfurt-HTL (441 m) 15.9 °C, variance n/a
highest sunshine duration: Klagenfurt-HTL (441 m) 164 h, variance n/a

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