

Information on the climate in Luxembourg in 2015

Station: Luxembourg/Findel-Airport (WMO 06590, 376 m, a.s.l.)
 Reference period: WMO normal period 1961 to 1990

1. Air temperature

Anomalies with respect to 2015

The annual mean air temperature for 2015 calculated by MeteoLux for its station at Luxembourg/Findel-Airport was 10.4 °C. The anomaly of the annual mean air temperature relative to the average of the reference period from 1961 to 1990 resulted in plus 2.1 K. The year 2015 (together with 2007) ranked the third-warmest year in station history since 1947. The total number of 56 frost days and 5 ice days were significantly lower than the long-term climate normal. In 2015 the number of summer days (44) and hot days (18) significantly exceeded the normal by 20 days, respectively 14 days.

Anomalies with respect to seasons

The winter 2014/2015 showed a mean air temperature of 1.7 °C. The air temperature was 1.0 K above the normal. In winter 2014/2015 the days with frost (50) were close to the normal. The numbers of ice days (6) were significantly below the normal (average of 21 ice days for 1961–1990). Spring mean air temperature (9.5 °C) was 1.7 K above the normal. The spring season was characterized by 9 frost days and no ice days. The number of frost days was considerably below the long-term average (19 days). Summer mean air temperature in 2015 was at 19.2 °C, deviating by plus 3.1 K from the normal. Following summer 2003 this season was the second-warmest summer ever registered at Luxembourg/Findel Airport since 1947. During this summer 43 summer days and 18 hot days occurred. This significantly exceeds the climate normal (21, respectively 3 days). The seasonal average in autumn was 9.6 °C, which is 0.8 K above the long-term average (1961–1990).

Anomalies with respect to single months

In 2015 the majority of months except for February, September and October exceeded the 1961–1990 normal (Figure 1).

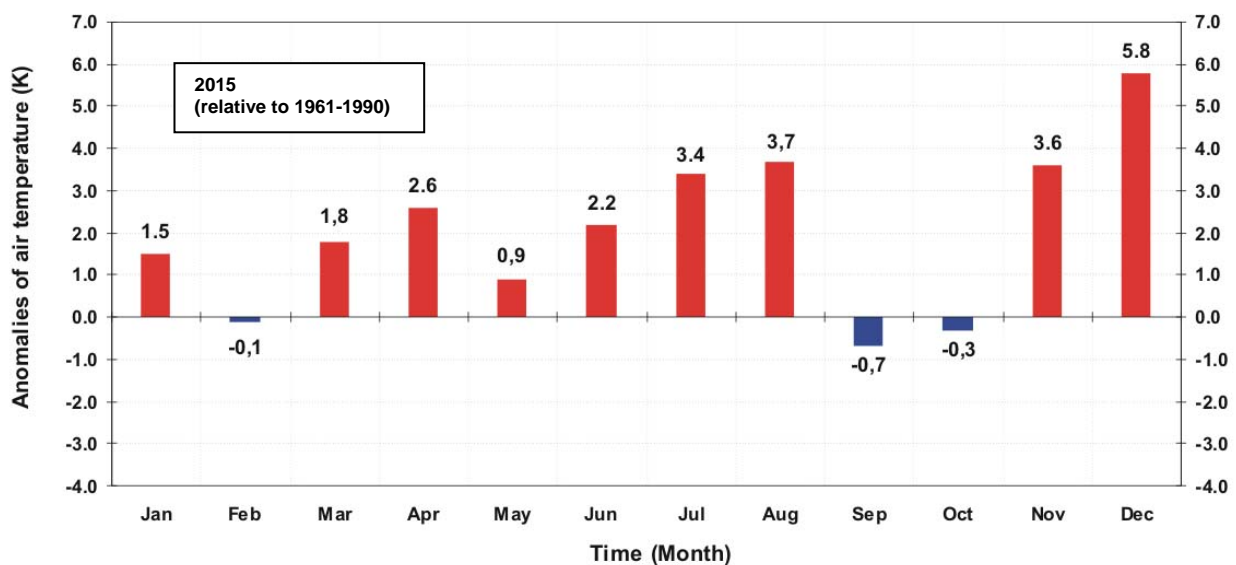


Fig. 1: Anomalies of monthly mean air temperatures (K) relative to the WMO normal period from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2015.

Due to the succession of several low-pressure systems mild and stormy weather from westerly directions was predominant in the first half of January, followed by a colder weather period until mid-February. During the remaining days in February a large number of fog days prevailed. Monthly mean air-temperatures in January were 1.5 K above the climate normal, whereas air temperatures in February were slightly lower than the long-term average (-0.1 K). During March a mixture of unsettled and stormy weather periods caused the monthly mean air temperature to rise 1.8 K above the normal (4 °C). April was dominated by some pronounced high-pressure periods. Sunny and warm weather during April caused the monthly mean air temperature to rise 2.6 K above the climate normal (7.5 °C). The mean air temperature in May was 12.7 °C, deviating plus 0.9 K from the normal. During several periods in June, July and August Luxembourg was situated between a high-pressure system over Central Europe and low pressure over the eastern Atlantic Ocean. This caused the advection of warm and moist sub-tropical air masses. Monthly mean air-temperatures rose to 17.1 °C, respectively 20.3 °C in July. July 2015 was the seventh-warmest July since 1947. The mean air temperature in August was 20.1 °C, deviating plus 3.7 K from the normal. Unsettled weather during the first two decades in September caused a monthly mean air temperature of 12.7 °C, slightly lower (-0.7 K) than the long-term average. The mean air temperature in October was 8.8 °C, deviating minus 0.3 K from the long-term average. By mid- October cold and dry air masses from easterly directions brought air temperatures to drop to a daily minimum air temperature of 1.0 °C (13.10.2015). Warm and dry weather dominated the first half of November. During this period strong south-westerly winds transported warm subtropical air masses to Central Europe. The monthly mean air temperature in November (7.4 °C) was 3.6 K above the climate normal. During most of December persistent westerly and south-westerly weather patterns caused air temperatures to rise 5.8 K above the climate normal. The monthly mean air temperature in December was 6.8 °C.

Table 1: Monthly and annual mean air temperatures (°C) as well as anomalies (K) relative to the WMO normal period from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2015.

2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Air temperatures (°C)	1.5	1.0	5.8	10.1	12.7	17.1	20.3	20.1	12.7	8.8	7.4	6.8	10.4
Normals (1961-1990)	0.0	1.1	4.0	7.5	11.8	14.9	16.9	16.4	13.4	9.1	3.8	1.0	8.3
Anomalies (K)	1.5	-0.1	1.8	2.6	0.9	2.2	3.4	3.7	-0.7	-0.3	3.6	5.8	2.1

Extremes and peculiarities

The heat wave throughout the end of June and early July can be referred to as exceptional. Luxembourg experienced the second-warmest summer in the station history since 1947. The absolute maximum air temperature during summer 2015 was recorded on July 4 (36.1 °C), the highest maximum temperature for July since 1947. August 2015 ranked the third-warmest August on record (20.1 °C). The monthly mean air temperature of 7.4 °C in November results in the third-warmest November (together with 1963) since 1947. December 2015 (6.8 °C) has been by far the warmest December ever recorded at Luxembourg/Findel-Airport by MeteoLux, breaking the previous record set in 1988.

2. Precipitation amount

In this report, observational days for precipitation are based on daily sums between 06 UTC and 06 UTC of the following day.

Anomalies with respect to 2015

The annual precipitation amount reached 604 mm in 2015. Annual rainfall was about 31% lower than the long-term average of 875 mm (1961 to 1990). This results in the fifth-driest year since the beginning of measurements in 1947.

Anomalies with respect to seasons

Seasonal precipitation in winter 2014/2015 amounted to a total of 184 mm at Luxembourg/Findel-Airport, about 13% below the long-term average (211 mm). In spring the precipitation amount reached only 109 mm. The seasonal precipitation total was about 49% lower than the 1961 to 1990 climate normal (212 mm). The number of precipitation days (≥ 0.1 mm) reached 37, significantly below the climate normal (48 days). Seasonal precipitation in summer amounted to 136 mm, significantly lower (about 39%) than the normal of the 30-year period from 1961 to 1990 (222 mm). MeteoLux recorded 216 mm in autumn, thus slightly lower than the normal (228 mm) at Findel-Airport.

Anomalies with respect to single months

All months, except for September showed precipitation amounts below the climate normal (Figure 2).

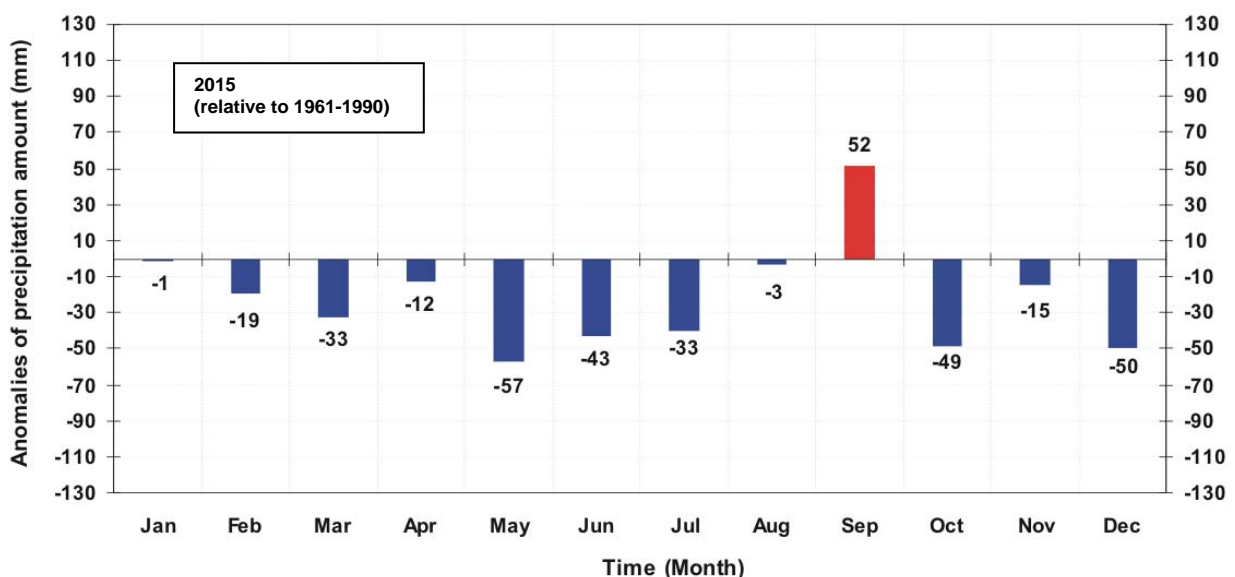


Fig. 2: Anomalies of monthly precipitation amount (mm) relative to the WMO normal period from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2015. Observational days for precipitation are based on daily sums between 06 UTC and 06 UTC of the following day.

In January 70 mm of precipitation were measured at Luxembourg/Findel-Airport, just slightly lower than the long-term average. As a result of persistent high-pressure periods February 2015 was significantly drier than normal. Precipitation amounted to 43 mm, representing a deficit of about 30%. Frequent high-pressure periods during most of spring caused precipitation reductions in all months. Precipitation amounts in March were 37 mm, in April 48 mm, and May 24 mm. March was about 47% and May 70% below the climate normal. June and July continued to be too dry. This resulted in monthly precipitation amounts of 39 mm and 28 mm, thus 52% and respectively 58% below the long-term averages. July 2015 was the ninth-driest month in station history since 1947. Unsettled weather during August caused a monthly precipitation amount of 69 mm, only slightly below the long-term average. September was the wettest month in 2015. Several low-pressure systems and a quasi-stationary front at the beginning of September caused precipitation amounts to rise up to about 122 mm, thus exceeding the climate normal by almost 75%. September 2015 settled in the eight-wettest September ever recorded since 1947. In contrast, October precipitation amounted to only 26 mm, with 65% significantly lower than the long-term average. This was caused by predominant high-pressure weather patterns. Unstable weather conditions and the advection of warm and moist subtropical air masses caused relatively abundant precipitation in November of as much as 68 mm, thus only 18% below the normal. In December 2015 a precipitation amount of 30 mm was recorded at Luxembourg/Findel-Airport. This is almost 63% below the normal, resulting in the sixth-driest December in station history and the lowest precipitation amount since 1975.

Table 2: Monthly and annual precipitation amount (mm) as well as anomalies (mm) relative to the WMO normal period from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2015. Observational days for precipitation are based on daily sums between 06 UTC and 06 UTC of the following day.

2015	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation amount (mm)	70	43	37	48	24	39	28	69	122	26	68	30	604
Normals (1961-1990)	71	62	70	61	81	82	68	72	70	75	83	80	875
Anomalies (mm)	-1	-19	-33	-13	-57	-43	-40	-3	52	-49	-15	-50	-271

Extremes and peculiarities

Spring 2015 was the sixth-driest spring in station history since 1947. Most of all, May ranked on number four of the driest months. Luxembourg registered its eighth-wettest September since records started at Findel-Airport. This month exceeded the long-term average by about 75%. On September 1, 2015 four station records concerning the precipitation intensity for September occurred. The maximum intensity in 10 minutes amounted to 11.2 mm, in 30 minutes to 16.8 mm, in 12 hours to 50.3 mm, and in 24 hours to 50.9 mm. On November 19, 2015 the maximum precipitation intensity in 30 minutes reached 7.1 mm, thus exceeding the former absolute maximum of 6.5 mm from 1989.