

Information on the climate in Luxembourg in 2017

Station: Luxembourg/Findel-Airport (WMO 06590, 376 m, a.s.l.)

Reference period: WMO normal period 1981 to 2010 (tables: 1981 to 2010 and 1961 to 1990)

1. Air temperature

Anomalies with respect to 2017

The annual mean air temperature for 2017 calculated by MeteoLux for its station at Luxembourg/Findel-Airport was 10.2 °C. The anomaly of the annual mean air temperature relative to the average of the reference period from 1981 to 2010 resulted in plus 0.9 K. The total number of 60 frost days and 12 ice days were lower than the long-term climate normal. In 2017 the number of summer days (39) and hot days (8) exceeded the normal by 6 days, respectively 4 days.

Anomalies with respect to seasons

The winter 2016/2017 showed a mean air temperature of 1.3 °C, deviating -0.1 K from the normal. In winter 2016/2017 the days with frost (54) were close to the normal and the number of ice days (11) was below the average of 16 ice days for the reference period 1981–2010. Spring mean air temperature (10.8 °C) was 1.8 K above the normal. The spring season was characterized by 3 frost days and no ice days. The number of frost days was significantly below the long-term average (13 days). A total of 7 summer days were observed in spring. The normal for this period is three days. The occurrence of two hot days was exceptional. The summer mean air temperature in 2017 was 18.8 °C, deviating by plus 1.5 K from the normal. During this summer 32 summer days and 6 hot days occurred. This exceeds the climate normal (28, respectively 4 days). The seasonal average in autumn was 9.7 °C, which is 0.3 K above the long-term average (1981–2010).

Anomalies with respect to single months

In 2017 the majority of months except for January, April and September exceeded the 1981–2010 normal (Figure 1).

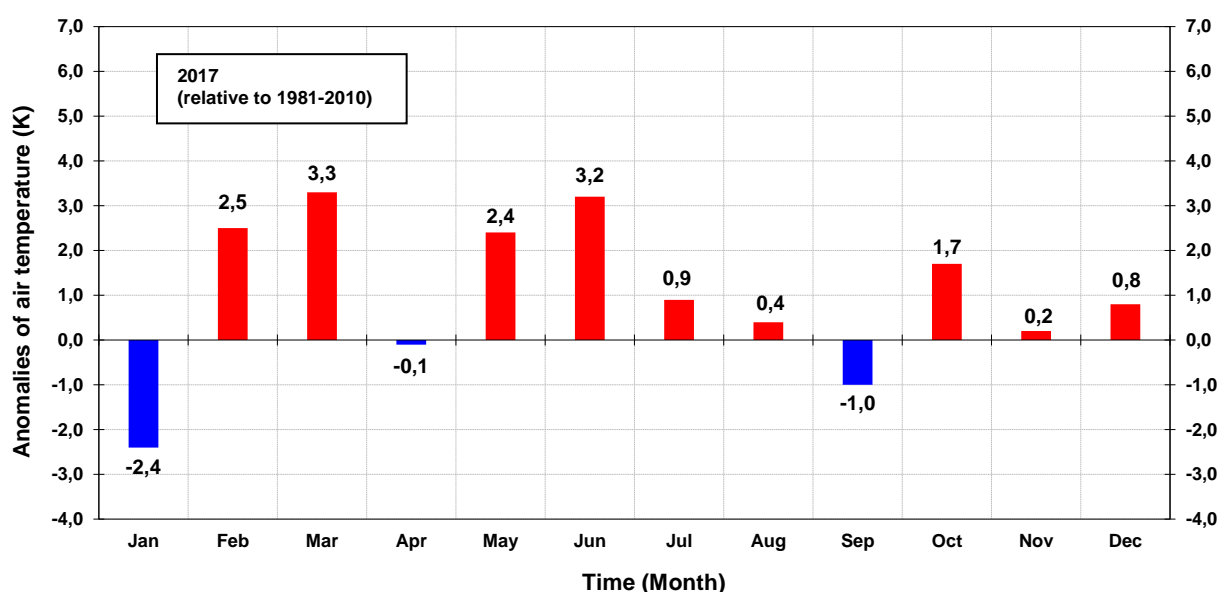


Fig. 1: Anomalies of monthly mean air temperatures (K) relative to the WMO normal period from 1981 to 2010 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2017.

After the pronounced high-pressure period at the end of December 2016 some low pressure systems in the first decade of January 2017 led to the first winter conditions in Luxembourg. High-pressure periods caused air temperatures to drop significantly above snow-covered surfaces. Monthly mean air-temperatures in January decreased to -1.6 °C, thus -2.4 K below the normal. Due to the succession of several low-pressure systems, mild and stormy weather was predominant during several periods in February. Monthly mean air-temperatures in February were 2.5 K above the climate normal. During March westerly weather patterns caused monthly mean air temperatures to rise significantly above the climate normal by 3.3 K. Pronounced high-pressure periods in the first decade of April, followed by unsettled weather caused cool maritime air masses to reach Luxembourg. Thus, monthly mean air temperatures in April dropped slightly below the climate normal (-0.1 K). During several periods in May low-pressure systems generated warm air advection. From the middle of May Luxembourg was influenced by high-pressure with extremely warm weather at the end of the month. Monthly mean air-temperatures in May were 2.4 K above the climate normal. During several periods in summer low-pressure systems caused the advection of warm and moist sub-tropical air masses. Monthly mean air-temperatures in June rose to 19.1 °C, in July to 19.1 °C, respectively 18.1 °C in August. Hence, monthly mean air temperatures in June were 3.2 K, in July 0.9 K and in August 0.4 K above the long-term average. In September cool maritime northwesterly winds led to unsettled weather periods and resulted in a monthly mean air temperature of 12.9 °C, deviating -1.0 K from the normal. Sunny and warm weather during large parts of October forced the monthly mean air temperature to rise by 1.7 K above the long-term average (9.5 °C). The monthly mean air temperature in November (4.9 °C) was 0.2 K above the climate normal. Low-pressure systems and very cloudy weather with generally moderate warm air prevailed in December 2017, resulting in positive anomalies of 0.8 K.

Table 1: Monthly and annual mean air temperatures (°C) as well as anomalies (K) relative to the WMO normal periods from 1981 to 2010 and from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2017.

2017	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Air temperatures (°C)	-1.6	4.1	8.5	8.6	15.4	19.1	19.1	18.1	12.9	11.2	4.9	2.6	10.2
Normals (1981-2010)	0.8	1.6	5.2	8.7	13.0	15.9	18.2	17.7	13.9	9.5	4.7	1.8	9.3
Anomalies (K)	-2.4	2.5	3.3	-0.1	2.4	3.2	0.9	0.4	-1.0	1.7	0.2	0.8	0.9
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)	-1.6	3.0	4.5	1.1	3.6	4.2	2.2	1.7	-0.5	2.1	1.1	1.6	1.9

Extremes and peculiarities

Together with 2012 March 2017 (8.5 °C) is the warmest March since the beginning of station records in 1947. The maximum air temperatures, recorded at Luxembourg/Findel-Airport on May 28, 2017 (31.5 °C) and on May 29, 2017 (31.6 °C), exceeded the existing absolute record from May 2009 (30.4 °C) on two subsequent days. The daily maximum air temperature of 35.4 °C recorded on June 22, 2017 is the highest value ever recorded in June since 1947. June 2017 (19.1 °C) is the third-warmest June in station history. This event can be referred to as unprecedented.

2. Precipitation amount

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

Anomalies with respect to 2017

The annual precipitation amount reached 726 mm in 2017. Annual rainfall was 19.0 % lower than the long-term average of 898 mm (1981 to 2010).

Anomalies with respect to seasons

Seasonal precipitation in winter 2016/2017 amounted to a total of 86 mm at Luxembourg/Findel-Airport, about 62% below the long-term average (226 mm). In spring the precipitation amount reached 89 mm. The seasonal precipitation total was about 57% lower than the 1981 to 2010 climate normal (206 mm). Seasonal precipitation in summer amounted to 222 mm, close to the normal for the 30-year period from 1981 to 2010 (226 mm). MeteoLux recorded 218 mm in autumn, thus slightly lower than the normal (239 mm) at Findel-Airport. During spring the precipitation days (≥ 0.1 mm) reached only 28 days, significantly lower than the long-term average (44 days). In autumn the number of precipitation days (54) was above the climate normal (46 days).

Anomalies with respect to single months

Precipitation amounts were highly variable throughout the year with considerable deficits during spring and early summer (Figure 2).

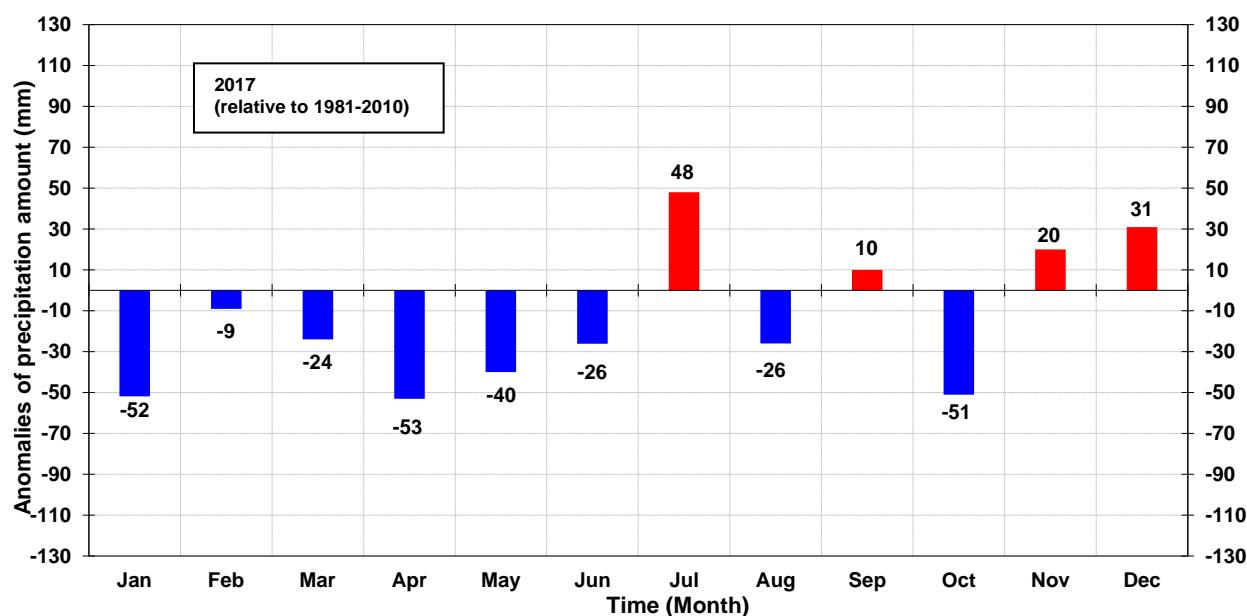


Fig. 2: Anomalies of monthly precipitation amount (mm) relative to the WMO normal period from 1981 to 2010 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2017. Observational days for precipitation are based on daily sums between 06 UTC and 06 UTC of the following day.

Low-pressure systems in the first half of January 2017 caused some small amounts of precipitation in Luxembourg. Nevertheless, due to persistent high-pressure periods the month remained very dry. In January 25 mm of precipitation were measured, nearly 68% less than the climate normal. Unsettled and

stormy weather caused precipitation to amount to 54 mm in February. March precipitation amounted to only 45 mm, which is 35% below the long-term average. Pronounced high-pressure periods in the first decade of April and May caused dry weather in Luxembourg. Precipitation amounts in April were only 5 mm, in May 39 mm, thus significantly below the climate normal (April minus 91%, May minus 51%). June was characterized by the alternation of some thunderstorm activity and pronounced high-pressure systems. The extensive dry weather periods caused monthly precipitation in June to be as low as 54 mm, thus almost 33% below the normal. In July several low-pressure systems resulted in the advection of warm and moist sub-tropical air masses including intense thunderstorm activity. Precipitation amounts in July were 119 mm, significantly exceeding the climate normal by 68%. August precipitation amounted to only 49 mm, about 35% less than the long-term average. Due to unsettled weather in September 86 mm of precipitation were measured, nearly 13% above the normal. Predominant high pressure caused dry periods in the middle of October. Thus, precipitation amounted to only 36 mm, with 59%, significantly lower than the long-term average. With the change of weather patterns in November more low-pressure systems caused monthly precipitation amounts to increase up to 96 mm, about 26% above the climate normal. Low-pressure systems and very cloudy weather, accompanied by frequent precipitation prevailed during December 2017. Precipitation amount in December reached 118 mm, exceeding the long-term average by roughly 36%.

Table 2: Monthly and annual precipitation amount (mm) as well as anomalies (mm) relative to the WMO normal period from 1981 to 2010 and from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2017. Observational days for precipitation are based on daily sums between 06 UTC and 06 UTC of the following day.

2017	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation amount (mm)	25	54	45	5	39	54	119	49	86	36	96	118	726
Normals (1981-2010)	77	63	69	58	79	80	71	75	76	87	76	87	898
Anomalies (mm)	-52	-9	-24	-53	-40	-26	48	-26	10	-51	20	31	-172
Normals (1961-1990)	71	62	70	61	81	82	68	72	70	75	83	80	875
Anomalies (mm)	-46	-8	-25	-56	-42	-28	51	-23	16	-39	13	38	-149

Extremes and peculiarities

Monthly precipitation amounts between January and June 2017 were all lower than the climate normal (about 34% on average). Most of all, April (5.3 mm) ranked on number two of the driest months at Luxembourg/Findel-Airport since station history in 1947, only exceeded by April 1996 with only 4.9 mm.