

Information on the climate in Luxembourg in 2016

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 2016

The annual mean air temperature for 2016 calculated by MeteoLux for its station at Luxembourg/Findel-Airport was 9.8 °C. The anomaly of the annual mean air temperature relative to the average of the reference period from 1961 to 1990 resulted in plus 1.5 K. The total number of 62 frost days and 6 ice days were significantly lower than the long-term climate normal. In 2016 the number of summer days (38) and hot days (8) exceeded the normal by 14 days, respectively 5 days.

Anomalies with respect to seasons

The winter 2015/2016 showed a mean air temperature of 4.1 °C, deviating plus 3.4 K from the normal. This winter was the second-warmest year in station history since 1947. In winter 2015/2016 the days with frost (26) and the number of ice days (5) were significantly below the normal (average of 57 frost days and 21 ice days for 1961–1990). Spring mean air temperature (8.4 °C) was 0.6 K above the normal. The spring season was characterized by 14 frost days and no ice days. The number of frost days was below the long-term average (19 days). Summer mean air temperature in 2016 was at 18.0 °C, deviating by plus 1.9 K from the normal. During this summer 28 summer days and 7 hot days occurred. This exceeds the climate normal (21, respectively 3 days). The seasonal average in autumn was 10.4 °C, which is 1.6 K above the long-term average (1961–1990). This results in the sixth-warmest autumn (together with 1947 and 1982) since 1947.

Anomalies with respect to single months

In 2016 the majority of months except for October exceeded the 1961–1990 normal (Figure 1). Due to the succession of several low-pressure systems mild and stormy weather from westerly directions was predominant during several periods in January and February, only occasionally interrupted by short colder weather periods. Monthly mean air-temperatures in January were 2.3 K above the climate normal, in February air temperatures were exceeding the long-term average by 2.2 K. During March and April a mixture of unsettled and stormy weather periods as well as some pronounced high-pressure periods caused alternately cool maritime and continental air masses to reach Luxembourg. Thus, monthly mean air temperatures in March and April rose only slightly above the climate normal (0.1 K, respectively 0.3 K). The mean air temperature in May was 13.4 °C, deviating plus 1.6 K from the normal. During several periods in June and July low pressure systems caused the advection of warm and moist sub-tropical air masses. Monthly mean air-temperatures rose to 16.4 °C, respectively 18.7 °C in July. Persisting high-pressure systems started to impact the weather in Luxembourg from the third decade in August on until the end of September. Monthly mean air-temperatures in August were 2.4 K above the climate normal. Sunny and warm weather during September caused the monthly mean air temperature to rise 4.0 K above the long-term average (17.4 °C). In October Luxembourg was situated between high-pressure over Northern and Western Europe as well as low pressure over Eastern Europe. Cold northeasterly winds caused a monthly mean air temperature of 8.9 °C, deviating minus 0.2 K from the normal. The monthly mean air temperature in November (4.9 °C) was 1.1 K above the long-term average. December was dominated by several pronounced high-pressure periods with dry and cool weather and a monthly mean air temperature of 1.5 °C. This is 0.5 K above the climate normal.

Extremes and peculiarities

The heat wave throughout the end of August can be referred to as exceptional. The absolute maximum air temperature was recorded at Luxembourg/Findel-Airport on August 26, 2016 (34.9 °C), the highest value ever recorded in the last decade of August since the beginning of station records in 1947. September 2015 ranked the second-warmest September on record (17.4 °C), nearly breaking the existing record from 2006 (17.5 °C).

2. Precipitation amount

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

Anomalies with respect to 2016

The annual precipitation amount reached 865 mm in 2016. Annual rainfall was about 1.1% lower than the long-term average of 875 mm (1961 to 1990).

Anomalies with respect to seasons

Seasonal precipitation in winter 2015/2016 amounted to a total of 193 mm at Luxembourg/Findel-Airport, about 8.5% below the long-term average (211 mm). In spring the precipitation amount reached 253 mm. The seasonal precipitation total was about 13% higher than the 1961 to 1990 climate normal (212 mm). Seasonal precipitation in summer amounted to 300 mm, significantly higher (about 35%) than the normal for the 30-year period from 1961 to 1990 (222 mm). The number of precipitation days (≥ 0.1 mm) reached 49, slightly above the climate normal (40 days). MeteoLux recorded 142 mm of precipitation in autumn, thus significantly lower than the normal (228 mm) at Findel-Airport. During several periods in June and July low pressure systems caused the advection of warm and moist sub-tropical air masses.

Anomalies with respect to single months

Precipitation amounts were highly variable throughout the year with a considerable surplus during the summer and deficits during autumn and most of all in December (Figure 2). In January and February precipitation amount at Luxembourg/Findel-Airport exceeded the long-term average by about 20% in January and 26% in February. During the second decade of March, high pressure was predominant over central Europe. In March 58 mm of precipitation were measured, nearly 12% lower than the climate normal. Precipitation amount in April reached 75 mm, exceeding the long-term average by 23%. Between Mid-May and July several low pressure systems caused the advection of warm and moist sub-tropical air masses including intense thunderstorm activity. Precipitation amounts in May were 120 mm, in June 135 mm, and July 144 mm, significantly exceeding the climate normal (May 48%, June 65%, July 112%). A pronounced high-pressure system over Central Europe with dry weather periods caused monthly precipitation in September to be as low as 29 mm, thus 41 mm below the long-term average. October precipitation amounted to only 38 mm, with 50%, significantly lower than the long-term average. With the change of weather patterns in November more low-pressure systems caused monthly precipitation amounts of 75 mm, only 10% less than the climate normal. Due to the extensive high-pressure periods in December 2016 only a precipitation amount of 7 mm was recorded at Luxembourg/Findel-Airport. This is almost 91% below the normal.

Extremes and peculiarities

Summer 2016 was the tenth-wettest summer in station history since 1947. Most of all, June ranked number four, July number three of the wettest months. More precipitation was recorded at Luxembourg Findel only in July 1987 (154 mm) and July 2000 (197 mm). On July 21, 2016 three station records concerning the precipitation intensity occurred. The maximum intensity in 60 minutes amounted to 47.5 mm, in 180 minutes to 58.1 mm, in 12 hours to 60.4 mm. All intensity records were absolute records that occurred at Luxembourg/Findel-Airport since 1947. On July 22 two additional records for July precipitation occurred. The maximum intensity in 30 minutes amounted to 28.4 mm and in 24 hours to 70.6 mm. In contrast, December 2016 was the second-driest December in station history.

Figures

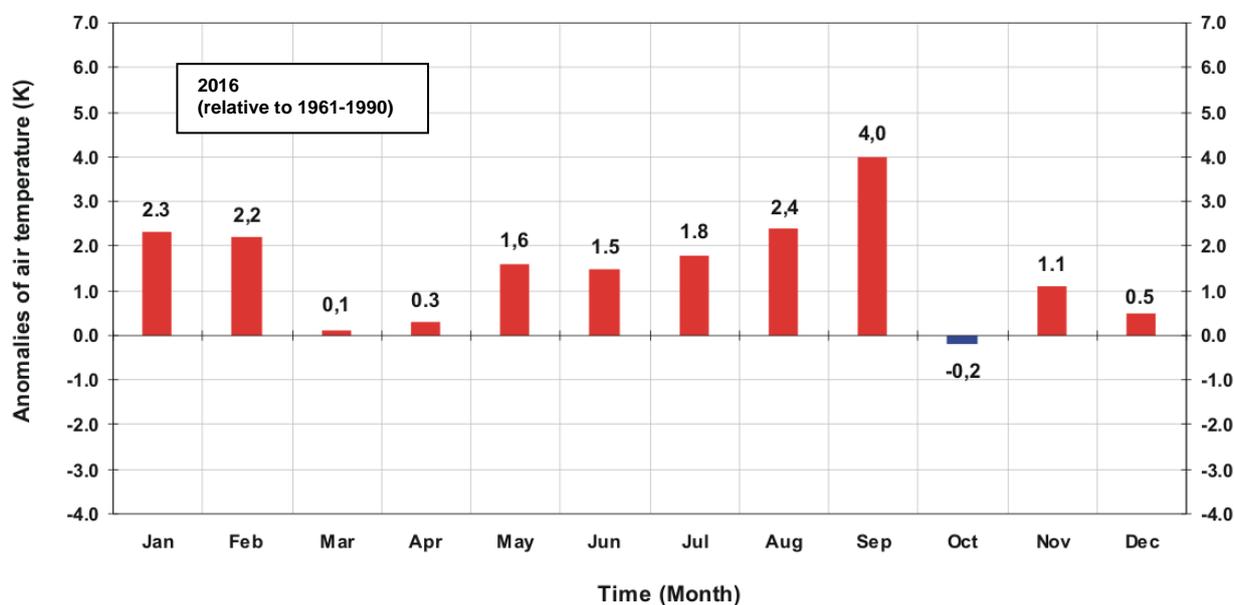


Fig. 1: Anomalies of monthly mean air temperatures (K) relative to the WMO normal period from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2016.

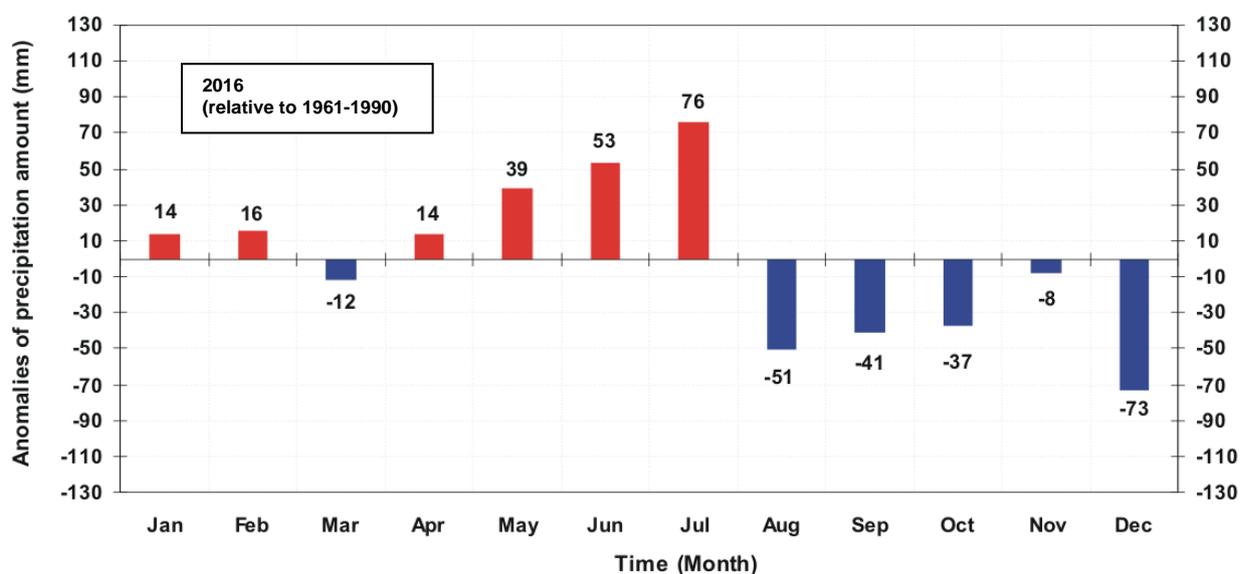


Fig. 2: Anomalies of monthly precipitation amount (mm) relative to the WMO normal period from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2016. Observational days for precipitation are based on daily sums between 06 UTC and 06 UTC of the following day.

Tables

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 2016.

2016	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Air temperatures (°C)	2.3	3.3	4.1	7.8	13.4	16.4	18.7	18.8	17.4	8.9	4.9	1.5	9.8
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)	2.3	2.2	0.1	0.3	1.6	1.5	1.8	2.4	4.0	-0.2	1.1	0.5	1.5

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 2016. Observational days for precipitation are based on daily sums between 06 UTC and 06 UTC of the following day.

2016	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation amount (mm)	85	78	58	75	120	135	144	21	29	38	75	7	865
Normals (1961-1990)	71	62	70	61	81	82	68	72	70	75	83	80	875
Anomalies (mm)	14	16	-12	14	39	53	76	-51	-41	-37	-8	-73	-10