

Information on the climate in Luxembourg in 2014

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 2014

The annual mean air temperature for 2014 calculated by MeteoLux for its station at Luxembourg Findel-Airport was 10.8 °C. The anomaly of the annual mean air temperature relative to the average of the reference period from 1961 to 1990 resulted in plus 2.5 K, thus the warmest year in the station history since 1947. The total number of 31 frost days (minimum air temperature < 0 °C) and 1 ice day (maximum air temperature < 0 °C) were significantly lower than the long-term climate normal. In 2014 the number of summer days (23), maximum air temperature ≥ 25 °C, almost matched the climate normal and the hot days (5), maximum air temperature ≥ 30 °C, slightly exceeded the normal by 1.5 days.

Anomalies with respect to seasons

The winter 2013/2014 showed a mean air temperature of 3.7 °C. The air temperature was 3.0 K above the normal, thus being the second-warmest winter (together with winter 1989/1990) in station history since 1947. In winter 2013/2014 the days with frost (26) were significantly below the normal. It is remarkable that no ice days were recorded at the station (average of 21 ice days for 1961-1990). Spring mean air temperature was 3.0 K above the normal, the third-warmest spring since 1947. The spring season was characterized by 5 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 2014 was at 17.4 °C, deviating by plus 1.3 K from the normal. During this summer 22 summer days occurred. This corresponds to the climate normal (21 days). The seasonal average in autumn was 11.5 °C, thus 2.7 K higher than the long-term average (1961-1990). Following autumn 2006 this season is the second-warmest autumn ever registered by MeteoLux at Luxembourg Findel Airport.

Anomalies with respect to single months

In 2014 all months except for August were above the 1961-1990 normal (Figure 1).

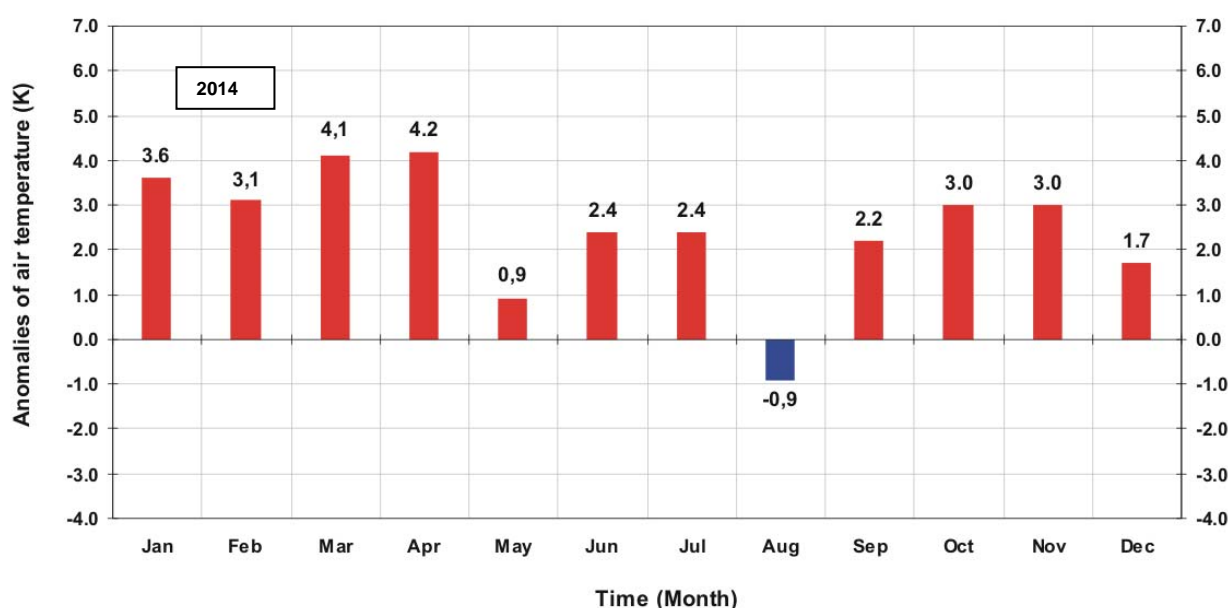


Fig. 1: Anomalies of monthly mean air temperatures (K) relative to the WMO normal period from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2014.

Due to the succession of numerous low-pressure systems mild weather from westerly and south-westerly directions was predominant in January and February 2014. This caused the monthly mean air temperature to rise 3.6 K, respectively 3.1 K above the long-term average. The three winter months ranked among the top ten of the warmest months for Luxembourg/Findel. March and April were dominated by several pronounced high-pressure periods. Extremely sunny and warm weather during March caused the monthly mean air temperature to rise 4.1 K above the climate normal (4.0 °C). March 2014 was the second-warmest March since 1947. The mean air temperature in April was 11.7 °C, deviating 4.2 K from the normal. This results in the fourth-warmest April in station history. Unsettled weather during May caused a monthly mean air temperature of 12.7 °C, only slightly above the long-term average. The temperature regimes in June and July were well-balanced. Whereas June was characterized by warm and moist sub-tropical air masses, unsettled weather prevailed during July. Monthly mean air-temperatures were 2.4 K above the climate normal in both months. In August Luxembourg was influenced by several low-pressure systems with long rainy and cool weather periods. The monthly mean air temperature was as low as 15.5 °C. There was only 1 summer month, significantly below the normal (7 days). The weather during the autumn months varied a lot. Due to a persisting southerly wind warm air masses dominated in autumn. Monthly mean air temperatures were above the climate normal (deviation of plus 2.2 K in September, and plus 3.0 K in October and November), resulting in the fifth-warmest October and the six-warmest November since 1947. During December mainly westerly wetter patterns caused air temperatures to raise 1.7 K above the climate normal. From December 27 on maritime polar air from northerly directions were predominant and caused daily air temperatures to drop significantly.

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 2014.

2014	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Air temperatures (°C)	3.6	4.2	8.1	11.7	12.7	17.3	19.3	15.5	15.6	12.1	6.8	2.7	10.8
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)	3.6	3.1	4.1	4.2	0.9	2.4	2.4	-0.9	2.2	3.0	3.0	1.7	2.5

Extremes and peculiarities

The mild weather situation throughout the year can be referred to as exceptional. Luxembourg experienced the warmest year in the station history since 1947. Winters like 2013/2014 without any ice days are rare. So far this occurred only once in the station history of Luxembourg/Findel (1974/1975). The absolute minimum air temperature during the winter 2013/2014 was recorded on February 3 (-3.2 °C). March 2014 was characterized by relatively high air temperatures. The mean maximum air temperature in March was 13.3 °C, the highest value in station history since 1947. No absolute temperature records during the other seasons were recorded by MeteoLux in 2014.

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 2014

The annual precipitation amount reached 856 mm in 2014. Annual rainfall was about 2% lower than the long-term average of 875 mm (1961 to 1990).

Anomalies with respect to seasons

Seasonal precipitation in winter 2013/2014 amounted to a total of 203 mm at Luxembourg/Findel-Airport, close to the long-term average. In spring the precipitation amount reached only 96 mm. The seasonal precipitation total was about 55% lower than the 1961 to 1990 climate normal (212 mm). The number of precipitation days (precipitation amount ≥ 0.1 mm) reached 29, significantly below the climate normal (48 days). Seasonal precipitation in summer amounted to 349 mm, significantly higher (about 57%) than the normal of the 30-year period (222 mm). The summer 2014 was the second-wettest summer recorded since 1947. MeteoLux recorded 194 mm in autumn, thus about 15% below the normal (228 mm) at Luxembourg Findel.

Anomalies with respect to single months

In January and February 2014 precipitation amounts of 77 mm and 69 mm were registered at Luxembourg/Findel. Both months showed precipitation slightly above the long-term average. The frequent high-pressure periods in the first half of the spring resulted in a very dry March (12 mm) and April (14 mm), thus 58 mm and 47 mm below the normal. March 2014 was the fifth-driest month, April 2014 together with April 1955 the third-driest in station history since 1947.

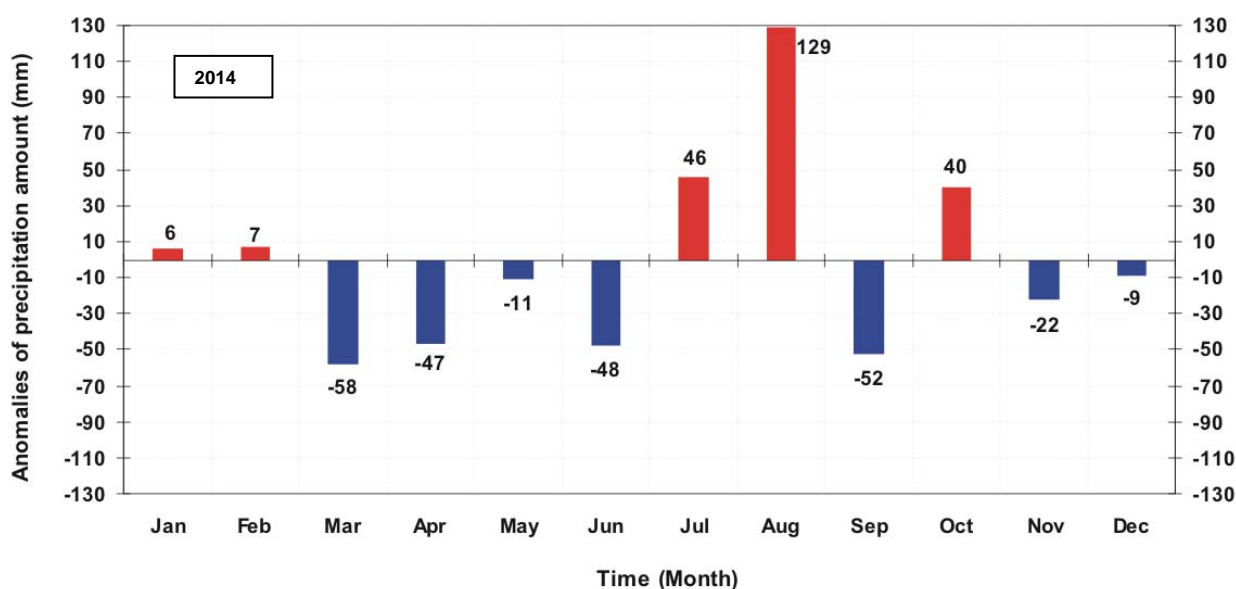


Fig. 2: Anomalies of monthly precipitation amount (mm) relative to the WMO normal period from 1961 to 1990 at Luxembourg/Findel (WMO 06590, 376 m, a.s.l.) in 2014. Observational days for precipitation are based on daily sums between 06 UTC and 06 UTC of the following day.

Unsettled weather during May caused a monthly precipitation amount of 70.0 mm, only slightly below the long-term average. June was relative dry and very sunny. This resulted in a monthly precipitation amount of 34 mm, 48 mm below the long-term average (82 mm). Unstable weather conditions with heavy precipitation events occurred in July and most of all in August. In July the total monthly precipitation reached 114 mm. On July 6, heavy thunderstorms that were embedded in a cold front caused considerable damage to property across the country of Luxembourg. August 2014 was the wettest August in station history. The monthly precipitation amount of 201 mm exceeded the long-term average by 129 mm. In contrast, September precipitation amounted to only 18 mm, the forth-driest September since 1947. Unstable weather conditions and the advection of warm and moist subtropical air masses caused abundant precipitation in October to be as much as 115 mm. Precipitation amount in November (61 mm) was 22 mm, in December (71 mm) just 9 mm below the climate normal.

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 2014. Observational days for precipitation are based on daily sums between 06 UTC and 06 UTC of the following day.

2014	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation amount (mm)	77	69	12	14	70	34	114	201	18	115	61	71	856
Normals (1961-1990)	71	62	70	61	81	82	68	72	70	75	83	80	875
Anomalies (mm)	6	7	-58	-47	-11	-48	46	129	-52	40	-22	-9	-19

Extremes and peculiarities

Luxembourg had its wettest August since records started at Findel-Airport in 1947. This month exceeded the long-term average by 167%. The highest daily precipitation maximum in autumn 2014 was registered by MeteoLux on October 8 (34.9 mm). On this day three station records concerning the precipitation intensity for October occurred. The maximum intensity in 10 minutes amounted to 10.8 mm, in 30 minutes to 13.5 mm and in 60 minutes to 14.8 mm.