

Weather Data summary for August 2023 for the Blenheim Meteorological station located at the Grovetown Park campus of the Marlborough Research Centre.

Table 1: Weekly weather data during August 2023

	Mean (°C)	Mean Max (°C)	Mean Min (°C)	Ground Frosts	Air Frosts	Rainfall (mm)	Sunshine (hours)	Wind-run (km)
1 st - 7 th	8.1 (-1.1)	14.1 (-0.2)	2.2 (-1.8)	3	2	2.2	45.2	189.3
8 th - 14 th	6.9 (-2.3)	12.6 (-1.7)	1.3 (-2.7)	6	3	6.8	49.4	226.4
15 th - 21 st	8.2 (-1.0)	14.2 (-0.1)	2.3 (-1.7)	5	1	15.0	45.9	192.7
22 nd - 28 th	7.8 (-1.4)	13.2 (-1.1)	2.4 (-1.6)	4	1	0.2	60.3	156.7
29 th – 31 st (3 days)	8.4 (-0.8)	16.0 (+1.7)	0.7 (-3.3)	2	1	0.0	32.2	186.3
1 st – 31 st August 2023	7.8 (-1.4)	13.7 (-0.6)	1.9 (-2.1)	20 (+9.8)	8 (+4.5)	24.2 (38%)	233.0 (126%)	190.8 (83%)
August LTA (1986 – 2022)	9.2	14.3	4.0	10.2	3.5	63.2	184.2	231.1

LTA – Long Term Average

August 2023 was very cold with very high number of frosts, very high sunshine hours and low rainfall

Temperature

Mean temperature of 7.8°C was 1.4°C below the long-term average (LTA) temperature for August of 9.2°C (1986-2022). We have to go back 27 years to August 1996, with a mean temperature of 7.7°C, to find a cooler August. August 2022 mean temperature of 10.4°C was 2.6°C warmer than August 2023.

- August 2022 mean temperature was 10.4°C.
- August 2021 mean temperature was 9.5°C.
- August 2020 mean temperature was 10.3°C.
- August 2009 mean temperature was 10.85°C; warmest on record

Frosts

There were 8 air frosts in August 2023, compared to the LTA of 3.5. This is the highest number of air frosts since August 2004, when 10 were recorded.

There were 20 ground frosts in August 2023, compared to the LTA of 10.2. The most ‘recent’ year to have recorded 20 ground frosts in August was 1972 (51 years ago). We have to go back to 1959 (64 years ago) to find a year with a higher number of ground frosts in August, when 22 were recorded.

It is interesting to compare the average August ground frost temperatures in 2023, 1985, and 1972. Although these years recorded almost the same number of ground frosts, the mean ground frost temperature in August 2023 was not as cold as it was in previous decades (Table 2).

Table 2: Ground frost temperature comparison

	Number of ground frosts	Mean ground frost temperature	Coldest ground frost in month
August 2023	20	-2.80	-5.2
August 1985	19	-3.47	-6.6
August 1972	20	-3.94	-6.6

There were 3 air frosts and 11 ground frosts in August 2022

There were 2 air frosts and 11 ground frosts in August 2021

LTA is 3.5 air frosts and 10.2 ground frosts in August

The coldest air minimum (air frost) temperature of -1.6°C was recorded on 11 August. This was the coldest air frost of winter 2023 (June, July, August). The coldest ground minimum (ground frost) temperature of -5.2°C was recorded on 3 August. This was the coldest ground frost of winter 2023.

Sunshine

233.0 hours sunshine for August is 126% of the LTA for August of 184.2 hours (1986-2022). This is now the second highest August sunshine total on record over the 94 years 1930 to 2023. Only two hours behind the highest total of 235.0 hours recorded in August 2011.

August 2022 recorded 156.2 hours sunshine.

August 2021 recorded 158.8 hours sunshine.

August 2020 recorded 222.9 hours sunshine. (4th sunniest August on record)

August 2011 recorded 235.0 hours sunshine. Highest total on record (1930-2023)

August 1941 recorded 129.2 hours sunshine. Lowest total on record (1930-2023)

Total sunshine for Blenheim for the eight months January to August 2023 is 1547.6 hours, or 97% of the LTA of 1591.3 hours.

Despite recording the second highest August sunshine total on record, Blenheim was only in second place nationally for sunshine hours in August. Blenheim's arch sunshine nemesis Richmond took out first place.

Richmond is also leading the race for total sunshine hours for the 8-months January to August 2023. Tekapo is in second place, New Plymouth in third place, Appleby in fourth place and Blenheim in fifth place.

Rainfall

Rainfall total of 24.2 mm for August was 38% of the LTA for August of 63.2 mm (1986-2022). This is the lowest August rainfall total since 2014, which recorded 9.6 mm. It is the 10th lowest August total on record from 1930 to 2023.

August 2022 rainfall was 112.4 mm.

August 2021 rainfall was 71.2 mm.

August 2020 rainfall was 49.6 mm.

August 1969 rainfall was 4.9 mm – driest on record (1930 – 2023)

August 1990 rainfall was 172.1 mm – wettest on record (1930 – 2023)

Total rainfall for Blenheim for the eight months January to August 2023 is 344.6 mm or 79% of the LTA of 437.0 mm (1986-2022). The total to the end of August 2023 is only 53% of the total to the end of August 2022.

Total rainfall for Blenheim for the eight months January to August 2022 was 653.8 mm or 150% of the LTA of 437.0 mm (1986-2022). This is the third highest January to August total on record for the 94 years 1930 to 2023.

Wind

Average daily wind run for August 2023 was 190.8 km, with an average wind speed of 8.0 km/hr. The LTA wind-run for August is 231.1 km. Blenheim has now had 24 consecutive months with lower than average wind-run.

Winter 2023

Table 3 summarises the main weather parameters over the three winter months of June, July and August for the nine years 2015 to 2023 compared to the LTA.

Table 3: Summary of winter (June, July and August) weather parameters for Blenheim for the nine years 2015 to 2023 compared to the long-term average

	LTA	2015	2016	2017	2018	2019	2020	2021	2022	2023
Mean air temp (°C)	8.7	8.6	9.0	9.0	9.3	9.0	9.51	9.53	9.59	8.7
Mean 30 cm soil temp (°C)	8.1	7.9	8.6	9.5	9.0	8.5	9.2	9.2	9.4	8.3
Number of ground frosts	36.5	41	32	30	36	36	23	32	28	40
Mean ground frost temp (°C)	NA	-3.1	-2.8	-3.0	-2.1	-2.8	-2.4	-3.0	-2.5	-2.6
Total rainfall	198.0	172.0	150.4	146.6	170.6	194.2	144.0	290.4	413.4	70.2
Total sunshine	496.3	560.4	537.5	504.6	504.8	529.2	510.8	480.5	410.3	596.6
Average daily wind-run (km)	224.9	240.8	229.6	195.1	207.9	208.9	194.6	203.9	205.8	192.2

Air temperature

The first two months of winter 2023 recorded well above average mean temperatures; (June 9.7°C was +0.9°C; July 8.5°C was +0.5°C); However, August with a mean temperature of 7.8°C was -1.4°C below average.

July should traditionally be the coldest month of winter. However, the August mean temperature of 7.8°C was 0.7°C colder than the July 2023 mean temperature of 8.5°C.

The mean winter air temperature of 8.7°C was equal to the LTA. This is the coldest winter since 2015. Winter 2023 was considerably cooler than the previous three winters in 2022, 2021 and 2020.

Soil temperature

The mean 30 cm soil temperature over winter 2023 of 8.3°C, was 0.2°C above the LTA This was due to the soil temperatures in June and July being well above average. The August soil temperature was well below average.

Ground frosts

40 ground frosts were recorded over winter in 2023, compared to the LTA of 36.5. Ground frosts in June = 4., July = 16, August = 20.

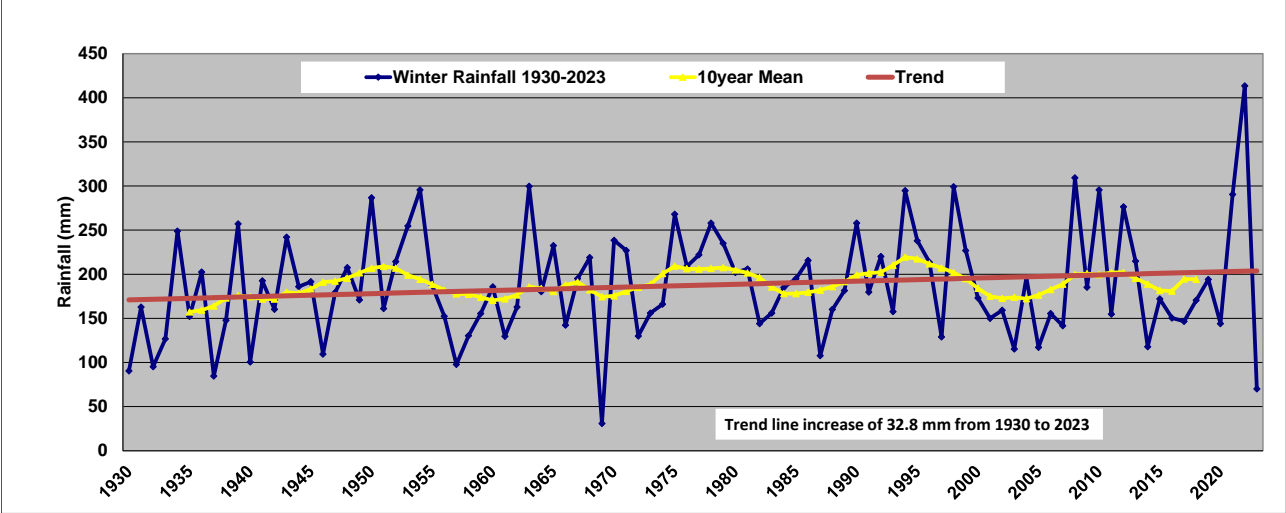
It is interesting to note that the LTA number of ground frosts in August (10.20) is lower than in both June (11.6) and July 14.7). Total number of winter ground frosts in 2023 of 40 is the highest number since 2015, when 41 were recorded.

Rainfall

Total rainfall over winter 2023 of 70.2 mm is 35% of the LTA of 198 mm. This is now the second lowest winter rainfall total on record for Blenheim over the 94 years 1930 to 2023. The lowest winter rainfall of 31.0 mm was recorded in 1969. In dramatic contrast winter 2022 recorded 413.4 mm rainfall, the highest total on record. 70.2 mm rain in winter 2023 was only 17% of the winter 2022 rainfall of 413.4 mm.

Figure 2 indicates how Blenheim's winter rainfall can vary markedly from year to year, (in the same manner as monthly and annual rainfall also vary). The extreme difference in winter rainfall between 2022 and 2023 is clearly illustrated.

Figure 1: Annual winter rainfall (June, July, August) in Blenheim 1930 to 2023



Sunshine

Total sunshine over winter 2023 of 596.6 hours was 120% of the LTA of 496.3 hours. This is now the highest winter sunshine total on record over the 94 years 1930 to 2023. The previous highest total of 595.6 hours was recorded in 1972.

Wind-run

Average daily wind-run over winter 2023 was 192.2 km, 85% of the LTA of 224.9 km

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