

Meteorological data summary for December 2023 and Annual Summary for 2023, for the Blenheim weather station located at the Grovetown Park campus of the Marlborough Research Centre.

Table 1: Weekly temperatures, rainfall and sunshine during December 2023

	Mean (°C)	Mean Max (°C)	Mean Min (°C)	Rainfall (mm)	Sunshine (hours)	Wind-run (km)
1 st - 7 th	15.9 (-1.0)	20.8 (-1.1)	10.9 (-0.9)	0.6	40.7	215.1
8 th - 14 th	15.6 (-1.3)	21.5 (-0.4)	9.7 (-2.1)	2.6	62.5	255.7
15 th - 21 st	19.3 (+2.4)	25.4 (+3.5)	13.1 (+1.3)	0.0	69.8	265.7
22 nd - 28 th	19.7 (+2.8)	25.8 (+3.9)	13.6 (+1.8)	10.2	43.2	194.7
29 th - 31 st (3 days)	22.3 (+5.4)	27.8 (+5.9)	16.8 (+5.0)	0.8	28.4	327.7
1st - 31st December	18.1 (+1.2°C)	23.8 (+1.9°C)	12.3 (+0.5)	14.2 29%	244.6 98%	242.0 87%
LTA 1986-2022	16.9	21.9	11.8	48.4	248.9	277.1

Temperatures for December

The mean temperature of 18.1°C for December 2023 was 1.2°C above the long-term average (LTA) of 16.9°C (1986-2022). December 2023 is the 12th equal warmest December on record (1930-2023).

December 2022 mean temperature was 16.8°C.

December 2021 mean temperature was 18.6°C.

December 2020 mean temperature was 16.7°C.

December 2017 mean temperature was 18.7°C; +1.9°C, 2nd warmest December on record 1932-2023

December 2023 was a month of two distinct halves temperature wise. The first half of December was cooler than average whereas the latter half of the month recorded well above average temperatures.

The Maximum temperature during December 2023 was 29.4°C recorded on 26 December. There were 14-days during the month that recorded a maximum temperature greater than 25.0°C. In contrast there were only 3-days in December 2022 that recorded 25.0°C or higher.

The Minimum temperature during December 2023 was 5.9°C, recorded on 2 December.

Sunshine for December

244.6 hours sunshine for December 2023 was 98% of the LTA for December of 248.9 hours.

December 2022 recorded 234.2 hours sunshine

December 2021 recorded 201.5 hours sunshine

December 2020 recorded 255.4 hours sunshine

December 2017 recorded 319.1 hours sunshine; 2nd sunniest December on record 1930-2023

Rainfall for December

14.2 mm of rain for December 2023 was 29% of the LTA for December of 48.4 mm. This is the lowest monthly total in 2023. The total is the 10th equal lowest December total on record over the 94 years 1930 to 2023.

December 2022 recorded 48.8 mm

December 2021 recorded 85.8 mm

December 2020 recorded 22.8 mm

Wind-run

Average daily wind-run for December 2023 was 242 km, 87% of the December average (1996-2022).

Average daily wind speed in December was 10.1 km/hr compared to the December average of 11.5 km/hr.

Maximum wind speed of 64.4 km/hr was recorded on 9 December.

This is the 14th year in a row (2010 to 2023) when Blenheim has recorded lower than average wind-run in December. However, of the 14 years 1996 to 2009, only 4-years recorded lower than average daily wind-run. i.e. December in Blenheim is a lot less windy than it used to be (and also all other months).

Evapotranspiration

Total potential evapotranspiration for December 2023 was 150.4 mm, 108% of the LTA of 139.4 mm.

Soil Moisture for December

Average shallow soil moisture (5-35 cm depth) at the Grovetown Park weather station was 16.5% for December 2023 compared with 21.8% LTA (2002-2022).

Shallow soil moisture was 17.5% on 1 December, considerably drier than average. Soil moisture fell to 15.5% on 31 December, close to as low as it can go.

Moisture Deficit for December

The moisture deficit for December 2023 was -136.2 mm. This was much lower (more negative) than the LTA moisture deficit for December of -91.0 mm.

(14.2 mm rain minus 150.4 mm evapotranspiration = -136.2 mm moisture deficit).

Annual Statistics for Blenheim in 2023, compared to the long-term average

Sunshine

Total sunshine for Blenheim in 2023 was 2492.0 hours. This is 99% of the LTA of 2507.3 hours (1986-2022). 2023 is the 43rd sunniest year on record for Blenheim over the 94-year period 1930 to 2023.

2022 recorded 2479.3 hours sunshine: 44th sunniest year on record

2021 recorded 2522.7 hours sunshine: 30th sunniest year on record

2020 recorded 2602.1 hours sunshine: 12th sunniest year on record

2019 recorded 2799.1 hours sunshine: 2nd sunniest year on record

The sunniest year on record is 2015 with 2813.8 hours sunshine.

Provisional sunshine totals 2023 (NIWA will confirm sunshine totals)

Tekapo was the sunniest town in New Zealand during 2023. Tekapo recorded a very high sunshine total in December to leap ahead of Richmond.

Tekapo	2653.4 hours
Richmond	2635.1 hours (18.3 hours behind Tekapo. 1-day in December missing from total)
Appleby	2529.6 hours
Cromwell	2513.8 hours
Blenheim	2492.0 hours (161.4 behind Tekapo)
New Plymouth	2449.5 hours
Whakatane	2395.9 hours

Rainfall

Total rainfall for 2023 was 462.0 mm; 72% of the LTA (1986-2022) of 644.1 mm.

2023 is the 10th equal driest year on record for Blenheim for the 94 years 1930 to 2023.

2022 rainfall was 830.6 mm

2021 rainfall was 719.0 mm.

2020 rainfall was 461.4 mm.

2015 rainfall was 381.6 mm, the lowest total on record for Blenheim.

1995 rainfall was 1003.4 mm, the highest total on record for Blenheim.

Table 2: Monthly rainfall recorded in Blenheim for 2023

Month	Rainfall (mm)	% of long term average	Long-term average (mm) 1986-2022
January	60.4	146%	41.4
February	40.2	82%	48.8
March	55.6	136%	41.0
April	35.8	74%	48.6
May	82.4	139%	59.1
June	22	33%	66.0
July	24	35%	68.8
August	24.2	38%	63.2
September	48.2	92%	52.5
October	32.6	58%	56.1
November	22.4	45%	50.2
December	14.2	29%	48.4
Total (Jan-Dec)	462.0	72%	644.1

Three of the first 5-months of 2023 recorded above average rainfall. However, all 7-months from June to December recorded lower than average rainfall. June to December 2023 recorded 187.6 mm rain. This is the lowest total for June to December on record for Blenheim over the 94 years 1930 to 2023. Second lowest on record is 364.2 mm, in 2015, which is Blenheim's driest year on record.

Temperature

The mean temperature for 2023 was 13.73°C; 0.48°C above the LTA for the 37 years 1986-2022, of 13.25°C. This is the 8th hottest year on record for Blenheim (1933 to 2023) (Table 3).

9 months in 2023 recorded above average mean temperatures

3 months in 2023 recorded below average mean temperatures

The hottest day of 2023 was 4 February with a maximum temperature of 30.9°C.

3-days in 2023 recorded a maximum temperature of 30.0°C or greater. However, the LTA number of days of 30.0°C or greater over the 77-years 1947 to 2022 is only 2.8, so 2023 was average.

The coldest minimum air temperature was -1.6°C on 11 August with a ground frost of -4.8°C. The coldest ground frost was -5.2°C on 3 August.

Table 3: 10 hottest years on record for Blenheim for the 91-year period 1933 to 2023

Year	Temperature (°C)
2019	13.954
1998	13.950
2016	13.93
2018	13.89
2013	13.86
2021	13.85
2022	13.81
2023	13.73
2010	13.70
2017	13.67

Blenheim has reliable temperature records dating back to April 1932, a period of 92 years. Table 3 indicates that 9 of the 10-hottest years on record have occurred since 2010. Blenheim has definitely become warmer, especially over the last two decades.

Frosts

47 ground frosts were recorded in 2023; slightly less than the LTA of 50.1 (1986-2022).

16 air frosts were recorded in 2023; slightly less than the LTA average of 17.6.

39 ground frosts and 8 air frosts in 2022

51 ground frosts and 13 air frosts in 2021

37 ground frosts and 10 air frosts in 2020

47 ground frosts and 12 air frosts in 2019

Wind-run

Average daily wind-run for 2023 was 207.3 km, 83% of the LTA of 249.2 km (1996-2022).

For 16-years in a row (2008-2023) Blenheim has recorded lower than average daily wind-run and wind speed. This is quite remarkable given the fact that the LTA period is only for the 28 years 1996 to 2023.

All 12-months in 2022 recorded below average wind-run.

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