

Meteorological data summary for February 2023 and the three months of summer (December to February) for the Blenheim Meteorological station located at the Grovetown Park campus of the Marlborough Research Centre.

Table 1: Weekly temperatures, rainfall, sunshine and wind-run during February 2023

	Mean (°C)	Mean Max (°C)	Mean Min (°C)	Rainfall (mm)	Sunshine (hours)	Wind-run (km)
1 st - 7 th	22.9 (+3.0)	27.7 (+4.5)	18.0 (+5.5)	1.6	52.6	263.0
8 th - 14 th	17.5 (-1.4)	21.4 (-1.8)	13.6 (+1.1)	12.6	49.0	228.9
15 th - 21 st	18.3 (-0.6)	24.1 (+0.9)	12.5 (=)	8.0	60.2	178.1
22 nd - 28 th	16.4 (-1.5)	20.4 (-2.8)	12.4 (-0.1)	18.0	32.2	180.3
1st – 28th February	18.8 (+0.9°C)	23.4 (+0.2)	14.1 (+1.6°C)	40.2 82%	193.9 84%	212.6 86%
LTA 1986-2022	17.9	23.2	12.5	48.8	229.5	246.6

Temperature

February 2023 mean temperature of 18.8°C was 0.9°C above the long-term average (LTA) temperature for February (1986-2022). This was a lot warmer than in the previous two years. However, while the mean temperature was 0.9°C above the LTA, the mean maximum temperature was only 0.2°C above the LTA, whereas the mean minimum temperature was 1.6°C above the LTA; i.e. the daytime maximum temperatures were close to average but the overnight minimum temperatures were well above average. Minimum temperatures are generally above average when there is above average cloud cover.

The first week of February was exceptionally warm. In contrast the second and fourth weeks of February were well below average and the mean temperatures during these weeks were 5.4°C and 6.5°C cooler respectively than the first week.

February 2022 mean temperature was 17.3°C.

February 2021 mean temperature was 17.5°C.

February 2020 mean temperature was 19.2°C.

The hottest maximum temperature recorded in Blenheim was 30.9°C on 4 February 2023.

The coolest minimum temperature recorded in Blenheim was 9.0°C on 17 February 2023.

The average daily range in temperature in Blenheim was 9.3°C during February, whereas the LTA daily range for February is 10.8°C.

February 2023 recorded 2 days with maximum temperatures of 30°C or higher; 9 days of 25.0°C or higher

February 2022 recorded no days with maximum temperatures of 30°C or higher; 6 days of 25.0°C or higher

February 2021 recorded no days with maximum temperatures of 30°C or higher; 12 days of 25.0°C or higher

February 2020 recorded 4 days with maximum temperatures of 30°C or higher; 15 days of 25.0°C or higher

February 2019 recorded 5 days with maximum temperatures of 30°C or higher; 16 days of 25.0°C or higher

The average number of days of 30°C or higher during February over the 76 years 1947 to 2022 is only one; i.e. February 2019 and 2020 were the exception rather than the rule.

Summer temperatures

At the beginning of December 2022 NIWA predicted for Marlborough that there was a 55% chance of above average temperature, 40% chance of average temperature and only a 5% chance of below average temperature for the full 3-month period from December 2022 to February 2023; i.e. they were fairly certain that Marlborough would experience a warmer than average summer. The average temperature for the three summer months of 17.9°C was 0.2°C above the LTA; so NIWA's prediction was correct. However, it didn't feel like a warm summer and the first two months of summer were cooler than average. December recorded a mean temperature slightly below average (-0.1°C), January slightly below average (-0.2°C), and February well above average (+0.9°C). Essentially the very warm first week of February dragged both the February mean and the summer mean temperatures up above average. It is interesting what a difference one hot week made to the overall mean summer temperature.

Table 2: Monthly mean temperatures over the 6 summers from 2017-18 to 2022-23

	Long-term Average °C	2017-18 Mean °C	2018-19 Mean °C	2019-20 Mean °C	2020-21 Mean °C	2021-22 Mean °C	2022-23 Mean °C
December	16.8	18.7	17.4	16.7	16.7	18.6	16.8
January	18.2	20.7	20.7	17.5	18.4	18.3	18.0
February	17.9	18.8	18.9	19.2	17.5	17.3	18.8
Mean +/-LTA	17.7	19.4 +1.8	19.0 +1.4	17.8 +0.17	17.5 -0.2	18.1 +0.4	17.9 +0.2

Sunshine

193.9 hours sunshine for February was 84% of the LTA (1986-2022).

February 2022 recorded 157.3 hours sunshine (2nd lowest on record)

February 2021 recorded 263.9 hours sunshine

February 2020 recorded 270.9 hours sunshine

February 2019 recorded 289.4 hours sunshine

Summer Sunshine

Table 3: Sunshine hours over the 6 summers from 2017-18 to 2022-23

	Long-term Average	2017-18 hours	2018-19 hours	2019-20 hours	2020-21 hours	2021-22 hours	2022-23 hours
December	248.9	319.1	213.2	272.6	255.4	201.5	234.2
January	265.6	243.6	317.9	245.0	309.0	313.8	211.7
February	229.5	226.4	289.4	270.9	263.9	156.4	193.9
Total	744.0	789.1 106%	820.5 110%	788.5 106%	828.3 111%	671.7 90%	639.8 86%

All 3-months of the 2022-23 summer recorded below average sunshine hours. With a total of 639.8 hours, the summer sunshine total for 2022-23 is ranked 88th out of the 93 years on record, from 1930-31 to 2022-23; i.e. only 5 summers over the last 93 years have recorded less sunshine.

Rainfall

February rainfall total of 40.2 mm was 82% of the LTA (1986-2022).

February 2022 rainfall was 153.4 mm (2nd highest on record)

February 2021 rainfall was 22.8 mm

February 2020 rainfall was 8.6 mm

February 2019 rainfall was 8.0 mm

February 2018 rainfall was 181.4 mm (highest on record 1930 to 2022)

Summer Rainfall

Table 4: Rainfall over the 6 summers from 2017-18 to 2022-23

	Long-term Average	2017-18 mm	2018-19 mm	2019-20 mm	2020-21 mm	2021-22 mm	2022-23 mm
December	48.4	21.6	53.6	91.2	22.8	85.8	48.8
January	41.4	80.4	3.8	0.2	7.8	12.6	60.4
February	48.8	181.4	8.0	8.6	22.8	153.4	40.2
Total	138.9 mm	283.4 mm 204%	65.4 mm 47%	100.0 mm 72%	53.4 mm 38%	251.8 mm 181%	149.4 mm 108%

Total summer rainfall in 2023-23 of 149.4 mm was 108% of the LTA total. January was the only summer month to record above average rainfall. Blenheim (Marlborough) escaped the high rainfall that so much of the North Island received in January and February 2023. While it may have felt like a wet summer, rainfall was close to average. In contrast the previous summer of 2021-22 was a lot wetter in December 2021 and February 2022.

Wind Run

Average daily wind run for February 2023 was 212.6 km, 86% of the LTA (1996-2022) of 246.6 km.

Shallow Soil Moisture

Average shallow soil moisture (5–35 cm depth) at the Grovetown Park weather station for February was 20.6%. This is slightly above the LTA of 18.9%.

Potential Evapotranspiration

Potential evapotranspiration for February 2023 was 111.0 mm, 97% of February's LTA of 114.4 mm.

Table 5: Potential evapotranspiration over the 6 summers from 2017-18 to 2022-23

	Long-term Average	2017-18 mm	2018-19 mm	2019-20 mm	2020-21 mm	2021-22 mm	2022-23 mm
December	139.4	177.8	114.9	140.1	143.2	135.1	118.2
January	144.9	135.6	186.9	133.9	172.3	152.5	121.3
February	114.4	122.4	151.0	140.3	123.3	86.6	111.0
Total	398.7 mm	435.8 mm 109%	452.8 mm 114%	414.3 mm 104%	438.8 mm 110%	374.2 mm 94%	350.5 mm 88%

Potential Water Deficit

Potential water deficit (Table 6) is the difference between monthly rainfall received (Table 4) and potential monthly evapotranspiration lost (Table 5). Potential water deficit for February 2023 was -70.8 mm. LTA water deficit for February is -73.0 mm.

Potential water deficit for the three summer months December 2022 – February 2023 was -201.1 mm, 74% of the LTA.

Table 6: Potential Water Deficit over the 6 summers from 2017-18 to 2022-23

	Long-term Average	2017-18 mm	2018-19 mm	2019-20 mm	2020-21 mm	2021-22 mm	2022-23 mm
December	-91.0	-156.2	-61.3	-48.9	-120.4	-49.3	-69.4
January	-106.6	-55.2	-183.1	-133.7	-164.5	-139.9	-60.9
February	-73.0	+59.0	-143.0	-131.7	-100.5	+66.8	-70.8
Total	-270.6 mm	-152.4 mm 56%	-387.4 mm 143%	-314.3 mm 116%	-385.4 mm 142%	-122.4 mm 45%	-201.1 mm 74%