

Meteorological data summary for February 2024 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 2024

| | Mean (°C) | Mean Max (°C) | Mean Min (°C) | Rainfall (mm) | Sunshine (hours) | Wind-run (km) |
|--|----------------------|---------------------|----------------------|------------------|---------------------|------------------|
| 1 st - 7 th | 18.4 (+0.5) | 25.4 (+2.2) | 11.3 (-1.2) | 10.6 | 72.9 | 235.7 |
| 8 th - 14 th | 17.6 (-0.3) | 24.3 (+1.1) | 10.9 (-1.6) | 0 | 74.7 | 221.9 |
| 15 th - 21 st | 18.4 (+0.5) | 23.8 (+0.6) | 12.9 (+0.4) | 0 | 69.9 | 271.0 |
| 22 nd - 29 th | 17.6 (-0.3) | 23.7 (+0.5) | 11.4 (-1.1) | 2.0 | 69.9 | 213.0 |
| | | | | | | |
| 1st – 29th February | 18.0 (+0.1°C) | 24.3 (+1.1) | 11.6 (-0.9°C) | 12.6 26% | 287.4 126% | 234.6 96% |
| LTA 1986-2023 | 17.9 | 23.2 | 12.5 | 48.6 | 228.5 | 245.4 |

Temperature

February 2024 mean temperature of 18.0°C was 0.1°C above the long-term average (LTA) temperature for February (1986-2023). Most people would probably think that the mean temperature for February 2024 would have been further above the LTA. The average daily maximum temperature was well above the LTA. However, the average daily minimum was well below the LTA. The daily range in temperature was 12.7°C, which was 2.0°C greater than the LTA of 10.7°C. i.e. warm days and cool nights in February 2024.

The average temperature in February 2024 was 0.8°C cooler than in February 2023. However, the average maximum temperature in February 2024 was 24.3°C, compared to 23.4°C in February 2023. The average minimum temperature in February 2024 was 11.6°C, compared to 14.1°C in February 2023. It is generally the daytime temperatures that we remember, rather than the nighttime temperatures.

- February 2023 mean temperature was 18.8°C.
- 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 32.3°C on 6 February 2024.
The coolest minimum temperature recorded in Blenheim was 6.1°C on 4 February 2024.

- February 2024 recorded 1 day with maximum temperature of 30°C or higher; 15 days of 25.0°C or higher
- 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 77 years 1947 to 2023 is only one, so one day above 30.0°C in February 2024 equal to the LTA; i.e. February 2019 and 2020 were the exception rather than the rule.

Summer temperatures

At the beginning of December 2023 NIWA predicted for Marlborough that there was a 45% chance of above average temperature, 45% chance of average temperature and only a 10% chance of below average temperature for the full 3-month period from December 2023 to February 2024; i.e. they were fairly sure that Marlborough would experience a warmer than average summer. The average temperature for the three summer months of 18.4°C was 0.7°C above the LTA; so NIWA’s prediction was correct. All 3-months of summer 2023-24 recorded above average mean temperatures.

Table 2: Monthly mean temperatures over the 7 summers from 2017-18 to 2023-24

| | 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 | 2023-24 Mean °C |
|------------------------|----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| December | 16.9 | 18.7 | 17.4 | 16.7 | 16.7 | 18.6 | 16.8 | 18.1 |
| January | 18.2 | 20.7 | 20.7 | 17.5 | 18.4 | 18.3 | 18.0 | 19.2 |
| February | 17.9 | 18.8 | 18.9 | 19.2 | 17.5 | 17.3 | 18.8 | 18.0 |
| | | | | | | | | |
| Mean +/-LTA | 17.7 | 19.4 +1.7 | 19.0 +1.3 | 17.8 +0.1 | 17.5 -0.2 | 18.1 +0.4 | 17.9 +0.2 | 18.4 +0.7 |

Sunshine

287.4 hours sunshine for February was 126% of the LTA (1986-2023). February 2024 is the 7th sunniest February on record for the 95 years 1930 to 2024.

- February 2023 recorded 193.9 hours sunshine
- 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 7 summers from 2017-18 to 2023-24

| | Long-term Average | 2017-18 hours | 2018-19 hours | 2019-20 hours | 2020-21 hours | 2021-22 hours | 2022-23 hours | 2023-24 hours |
|----------|----------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| December | 248.8 | 319.1 | 213.2 | 272.6 | 255.4 | 201.5 | 234.2 | 244.6 |
| January | 264.2 | 243.6 | 317.9 | 245.0 | 309.0 | 313.8 | 211.7 | 316.7 |
| February | 228.5 | 226.4 | 289.4 | 270.9 | 263.9 | 156.4 | 193.9 | 287.4 |
| | | | | | | | | |
| Total | 741.5 | 789.1 106% | 820.5 111% | 788.5 106% | 828.3 112% | 671.7 91% | 639.8 86% | 848.7 114% |

December 2023 sunshine hours were only slightly below average. January and February 2024 recorded well above average sunshine hours. **The summer sunshine total of 848.7 hours, for 2023-24 is the second highest total for the 94 years on record, from 1930-31 to 2023-24.** 1972-73 is the sunniest summer on record with 857.6 hours.

Rainfall

February rainfall total of 12.6 mm was 26% of the LTA (1986-2023). Of interest is the fact that in 20 previous years between 1930 and 2023, February has recorded a lower rainfall total. The lowest February total on record of 1.0 mm was recorded in both 1973 and 1983.

Over the 20 years 2005 to 2024, February has recorded lower than average rainfall in 16 of those years. Only 4 of the 20 years have recorded above average rainfall. However, February 2018 with 181.8 mm and February 2022 with 153.4 mm are the highest and second highest February totals on record. This demonstrates what climate scientists have suggested may occur in Marlborough (the east coast of New Zealand), in that the lows may become lower and the highs higher.

- February 2023 rainfall was 40.2 mm
- 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

All 9-months from June 2023 to February 2024 recorded below average rainfall. Total rainfall for the 9-months was 206.8 mm, only 42% of the LTA of 495.6 mm. This is the lowest rainfall total for this 9-month period on record for the 94 years 1930-31 to 2023-24.

Summer Rainfall

Table 4: Rainfall over the 7 summers from 2017-18 to 2023-24

| | Long-term Average | 2017-18 mm | 2018-19 mm | 2019-20 mm | 2020-21 mm | 2021-22 mm | 2022-23 mm | 2023-24 mm |
|----------|----------------------|------------------|----------------|-----------------|----------------|------------------|------------------|----------------|
| December | 47.5 | 21.6 | 53.6 | 91.2 | 22.8 | 85.8 | 48.8 | 14.2 |
| January | 41.9 | 80.4 | 3.8 | 0.2 | 7.8 | 12.6 | 60.4 | 6.6 |
| February | 48.6 | 181.4 | 8.0 | 8.6 | 22.8 | 153.4 | 40.2 | 12.6 |
| | | | | | | | | |
| Total | 138.0 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% | 33.4 mm 24% |

Total summer rainfall in 2023-24 of 32.8 mm was 24% of the LTA total. This is the second lowest summer rainfall on record for Blenheim over the 94 years 1930-31 to 2023-24. The lowest total of 27.2 mm was recorded in the summer of 2000-01.

Wind Run

Average daily wind run for February 2024 was 234.6 km, 96% of the LTA (1996-2023) of 245.4 km. There were 9-days in February with above average wind-run and 20 days with below average wind-run.

Shallow Soil Moisture

Average shallow soil moisture (5–35 cm depth) at the Grovetown Park weather station for February was 15.1%. This is well below the LTA of 18.9%. The minimum moisture value that the topsoil goes down to is about 14%, i.e. the topsoil was close to as dry as it could be throughout February. Even the 10.2 mm rain recorded on 2 February only raised the topsoil moisture from 14.6% to 15.7%.

Potential Evapotranspiration

Potential evapotranspiration for February 2024 was 140.0 mm, 122% of February’s LTA of 114.3 mm.

Table 5: Potential evapotranspiration over the 7 summers from 2017-18 to 2023-24

| | Long-term Average | 2017-18 mm | 2018-19 mm | 2019-20 mm | 2020-21 mm | 2021-22 mm | 2022-23 mm | 2023-24 mm |
|----------|----------------------|------------------|------------------|------------------|------------------|-----------------|-----------------|------------------|
| December | 139.8 | 177.8 | 114.9 | 140.1 | 143.2 | 135.1 | 118.2 | 150.4 |
| January | 144.0 | 135.6 | 186.9 | 133.9 | 172.3 | 152.5 | 121.3 | 165.9 |
| February | 114.3 | 122.4 | 151.0 | 140.3 | 123.3 | 86.6 | 111.0 | 140.0 |
| | | | | | | | | |
| Total | 398.1 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% | 456.3 mm 115% |

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 2024 was -127.4 mm, 175% of the LTA water deficit for February of -72.9 mm.

Potential water deficit for the three summer months December 2023 – February 2024 was -422.9 mm, 156% of the LTA. This is the largest summer water deficit that Blenheim has experienced over the 28 years 1996-97 to 2023-24 (the period for which potential evapotranspiration records are available).

Table 6: Potential Water Deficit over the 7 summers from 2017-18 to 2023-24

| | Long-term Average | 2017-18 mm | 2018-19 mm | 2019-20 mm | 2020-21 mm | 2021-22 mm | 2022-23 mm | 2023-24 mm |
|--------------|----------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|---------------------------------|
| December | -92.6 | -156.2 | -61.3 | -48.9 | -120.4 | -49.3 | -69.4 | -136.2 |
| January | -104.9 | -55.2 | -183.1 | -133.7 | -164.5 | -139.9 | -60.9 | -159.3 |
| February | -72.9 | +59.0 | -143.0 | -131.7 | -100.5 | +66.8 | -70.8 | -127.4 |
| | | | | | | | | |
| Total | -270.4 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% | -422.9 mm 156% |

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