

## Weather Data summary for August 2020 for the Blenheim Meteorological station located at the Grovetown Park campus of the Marlborough Research Centre.

**August 2020 mean temperature was a lot warmer than average. Blenheim set a new maximum temperature record on 31 August. Sunshine hours were well above average. Rainfall was below average. Air and ground frost numbers were well below average. Average daily wind-run well below average.**

**Table 1: Weekly weather data during August 2020**

	Mean Max (°C)	Mean Min (°C)	Mean (°C) Deviation	Ground Frosts	Air Frosts	Rainfall (mm)	Sunshine (hours)
1 <sup>st</sup> - 7 <sup>th</sup>	16.7	6.1	11.4 (+2.3)	0	0	5.4	37.3
8 <sup>th</sup> - 14 <sup>th</sup>	14.7	3.1	8.9 (-0.2)	2	0	0.0	57.2
15 <sup>th</sup> - 21 <sup>st</sup>	14.0	3.0	8.5 (-0.6)	3	1	22.0	49.8
22 <sup>nd</sup> - 28 <sup>th</sup>	15.5	5.1	10.3 (+1.2)	1	0	22.2	50.1
29 <sup>th</sup> - 31 <sup>st</sup> (3 days)	21.6	8.6	15.1 (+6.0)	0	0	0.0	28.5
1 <sup>st</sup> - 31 <sup>st</sup> August 2020	15.8 (+1.6)	4.7 (+0.8)	10.3 (+1.2)	6	1	49.6 (80%)	222.9 (121%)
August LTA (1986 - 2019)	14.2	3.9	9.1	10.3	3.7	61.9	184.7

LTA – Long Term Average

### **Temperature**

Mean temperature of 10.3°C was 1.2°C above the long-term average (LTA) temperature for August of 9.1°C (1986-2019).

August 2019 mean temperature was 8.8°C.

August 2018 mean temperature was 10.0°C.

August 2017 mean temperature was 10.3°C.

The first and fourth weeks of August 2020 both recorded well above average temperatures. The first week was 2.3°C above the LTA and the fourth week was 1.2°C above the LTA. The second and third weeks of August both recorded slightly below average mean temperatures.

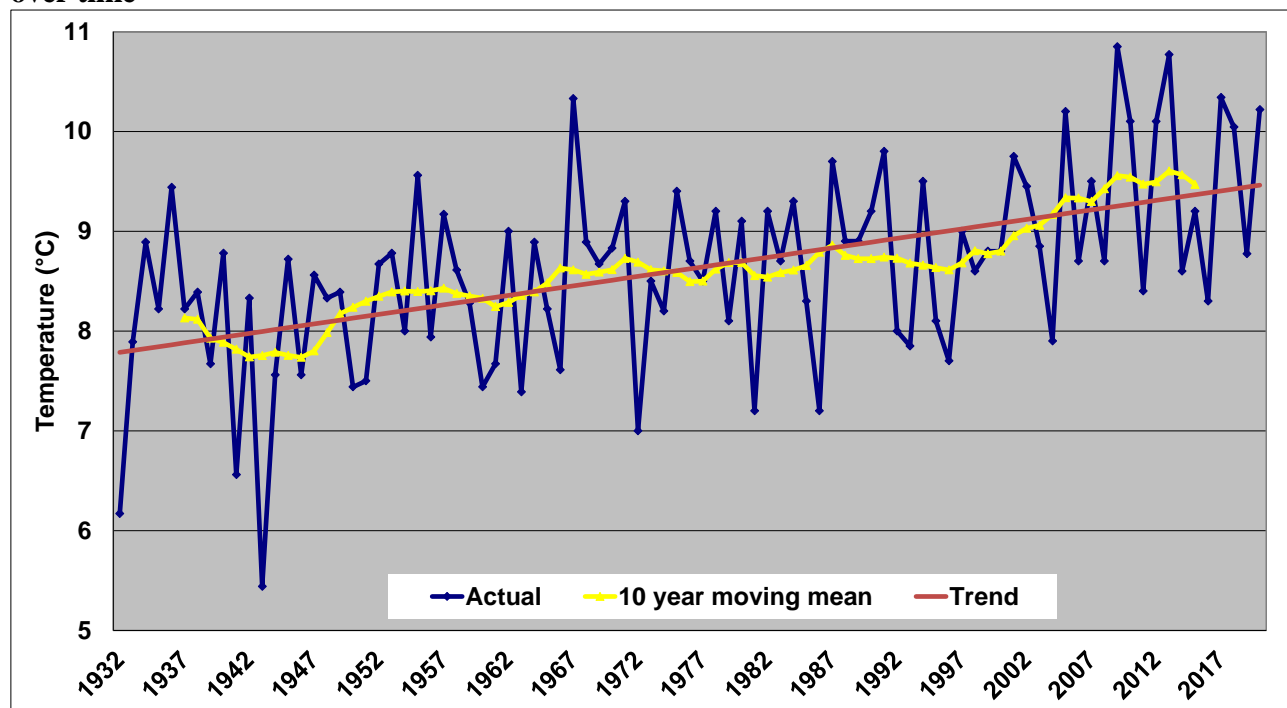
However, the final three days of the month were exceptionally warm, with a mean temperature of 15.1°C; 6.0°C above the August LTA. To put the mean temperature of 15.1°C over the final three days of August into context, this is warmer than the mean temperature for November of 14.8°C.

### **Highest ever August maximum temperatures recorded two days in a row**

30<sup>th</sup> August recorded a maximum temperature of 21.7°C. This surpassed the previous highest August maximum temperature of 21.6°C recorded on 31<sup>st</sup> August 2006. However, 30<sup>th</sup> August only held the record for one day as the 31<sup>st</sup> August recorded a maximum temperature of 23.8°C. 31<sup>st</sup> August 2020 is now the warmest August day on record for Blenheim over the 89 years 1932 to 2020. To put the maximum temperature of 23.8°C on 31<sup>st</sup> August into perspective, the long-term average daily maximum temperature for January is 23.6°C.

Despite the fact that the second and third weeks of August recorded below average mean temperatures August 2020 still managed to become the fifth warmest August on record for Blenheim for the 89 years 1932 to 2020. On many occasions over recent years I have detailed how Blenheim's winter temperatures have markedly warmed over the past few decades. Of the 10 warmest August mean temperatures on record for Blenheim for the 89 years 1932 to 2020, eight of those 10 years have occurred since 2005 (Figure 1). The red trend line indicates that the mean temperature for August has risen by 1.68°C over the past 89 years.

**Figure 1: Mean August temperatures in Blenheim over the 89 years 1932 to 2020 and trend in temperatures over time**



### Frosts

There was 1 air frost and 6 ground frosts in August 2020

There were 3 air frosts and 13 ground frosts in August 2019

There were 0 air frosts and 6 ground frosts in August 2018

There were 3 air frosts and 7 ground frosts in August 2017

The coldest air minimum temperature of  $-0.6^{\circ}\text{C}$  was recorded on 17<sup>th</sup> August

The coldest ground minimum temperature of  $-3.5^{\circ}\text{C}$  was recorded on 17<sup>th</sup> August.

August 2019 coldest air minimum was  $-1.2^{\circ}\text{C}$  and ground minimum of  $-5.9^{\circ}\text{C}$ .

August 2018 coldest air minimum was  $+1.2^{\circ}\text{C}$  and ground minimum of  $-2.3^{\circ}\text{C}$ .

August 2017 coldest air minimum was  $-1.3^{\circ}\text{C}$  and ground minimum of  $-5.0^{\circ}\text{C}$ .

### Sunshine

222.9 hours sunshine for August is 121% of the long term average for August of 184.7 hours (1986-2019). This was one hour more sunshine than in August 2019.

August 2020 is now the third sunniest August on record for Blenheim for the 91 years 1930 to 2020.

August 2019 recorded 221.9 hours sunshine. (4<sup>th</sup> sunniest August on record)

August 2018 recorded 179.7 hours sunshine.

August 2017 recorded 184.9 hours sunshine.

August 2011 recorded 235.0 hours sunshine. Highest total on record (1930-2020)

August 1941 recorded 129.2 hours sunshine. Lowest total on record (1930-2020)

Total sunshine for Blenheim for the eight months January to August 2020 is 1681.6 hours, or 106% of the long-term average of 1588.7 hours.

### Sunniest town in New Zealand

Blenheim was the sunniest town in New Zealand in August 2020 with 222.9 hours. This was 26.4 hours more than Richmond, in second place, which recorded 196.5 hours, in second place.

At the end of August 2020 Whakatane has the highest sunshine total for the first eight months of 2020. Blenheim is currently in fourth place.

Sunshine hours for the eight month January to August 2020

Whakatane	1768.9 hours
Richmond	1748.9 hours
New Plymouth	1713.1 hours
Blenheim	1681.6 hours (87.3 hours behind Whakatane)
Napier	1622.1 hours

### Rainfall

Rainfall total of 49.6 mm for August was 80% of the long-term average for August of 61.9 mm (1986-2019).

August 2019 rainfall was 56.6 mm.

August 2018 rainfall was 59.6 mm.

August 2017 rainfall was 65.8 mm.

August 1969 rainfall was 4.9 mm – driest on record (1930 – 2020)

August 1990 rainfall was 172.1 mm – wettest on record (1930 – 2020)

Total rainfall for Blenheim for the eight months January to August 2020 is 269.8 mm or 62% of the long-term average of 433.8 mm (1986-2019). This is the fourth lowest January to August rainfall total on record for Blenheim for the 91 years 1930 to 2020 (Table 2).

**Table 2: Lowest January to August rainfall totals on record for Blenheim**

Year	January to August rainfall total
1969	210.1 mm
2001	217.2 mm
2003	232.0 mm
2020	269.8 mm
1973	278.0 mm
2015	301.0 mm
LTA	433.8 mm

### Wind

Average daily wind run for August 2020 was 207.8 km, with an average wind speed of 8.7 km/hr. The long-term average wind-run for August is 233.2 km (1996-2019). Only eight days during August recorded above average wind-run, 23 days recorded below average wind-run.

August 2020 continued the trend that has occurred over the last 10 years, with the vast majority of months recording below average wind-run; i.e. from January 2010 to August 2020 is a period of 10 years and 8 months. Of these 128 months 104 have recorded below average wind-run (81%) and only 24 have recorded above average wind-run (19%).

## Winter 2020

Table 3 summarises the main weather parameters over the three winter months of June, July and August for the six years 2015 to 2020 compared to the LTA.

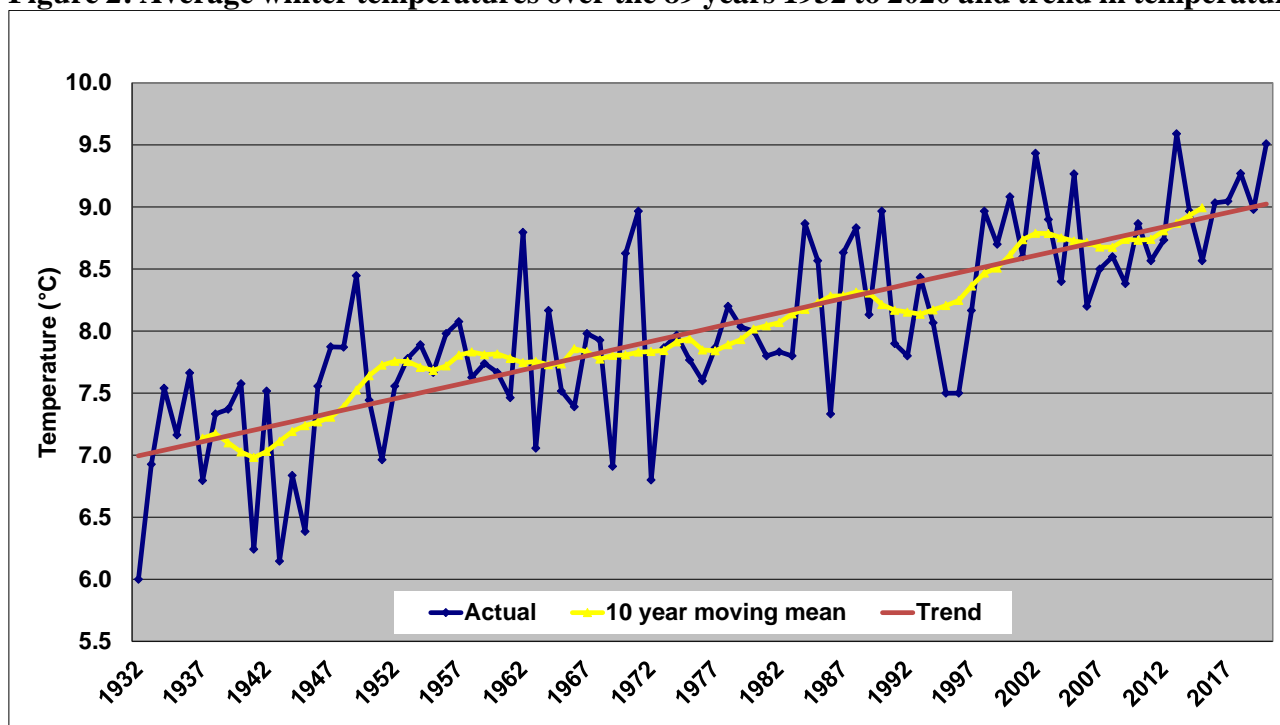
**Table 3: Summary of winter weather parameters for Blenheim for the six years 2015 to 2020 compared to the long-term average**

	LTA	2015	2016	2017	2018	2019	2020
Mean air temp (°C)	8.6	8.6	9.0	9.0	9.3	9.0	9.5
Mean 30 cm soil temp (°C)	8.0	7.9	8.6	9.5	9.0	8.5	9.2
Number of ground frosts	37.3	41	32	30	36	36	23
Mean ground frost temp (°C)	NA	-3.1	-2.8	-3.0	-2.1	-2.8	-2.4
Total rainfall	190.5	172.0	150.4	146.6	170.6	194.2	144.0
Total sunshine	498.8	560.4	537.5	504.6	504.8	529.2	510.8
Average daily wind-run (km)	227.9	240.8	229.6	195.1	207.9	208.9	194.6

All three winter months in 2020, (June, July, August) recorded well above average mean temperatures (individual monthly data not shown in Table 3). The mean winter air temperature of 9.5°C was 0.9°C warmer than the LTA. The winter of 2020 is now the second warmest winter on record for Blenheim (1932 to 2020).

Figure 2 indicates that Blenheim's average winter temperatures have warmed dramatically over the past 89 years. The red trend line indicates that Blenheim's winter temperatures have warmed by 2.03°C over the 91 years from 1930 to 2020. As has been pointed out on many previous occasions, Blenheim's winters are now far warmer than they were in the mid-20<sup>th</sup> century.

**Figure 2: Average winter temperatures over the 89 years 1932 to 2020 and trend in temperatures over time**



As a consequence of warmer than average air temperatures and lower than average number of ground frosts, the mean 30 cm soil temperature over winter was much warmer than the LTA.

23 ground frosts were recorded over winter, compared to the LTA of 37.3. This is the lowest total number of winter ground frosts recorded in Blenheim over the 89 years 1932 to 2020.

Total rainfall over winter of 144.0 mm is 76% of the LTA of 190.5 mm, slightly lower than in 2016 and 2017. It is interesting to note that of five of the six winters from 2015 to 2020 recorded below average rainfall.

Total rainfall for the 8-months January to August 2020 is 269.8 mm. This is the fourth lowest January to August rainfall total on record for Blenheim for the 91 years 1930 to 2020. As signalled in the last couple of months, Blenheim needed well above average rainfall over winter in order to make up for the lack of rainfall earlier in 2020. This hasn't happened and many soil types will still be below field capacity going into the spring.

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