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

June 2020 mean temperature and rainfall were both above average. Sunshine hours, average daily wind-run and number of frosts were greatly below average.

Table 1: Weekly temperatures, rainfall, sunshine and frosts recorded in Blenheim during June 2020

	Mean Max	Mean Min	Mean. Diff.	Rainfall (mm)	Sunshine (hours)	Total Ground Frosts	Total Air Frosts
1-7 June	14.8	5.1	10.0 (+1.3)	35.2	28.6	0	0
8-14 June	15.2	3.3	9.2 (+0.5)	0.0	48.0	2	0
15-21 June	14.7	7.1	10.9 (+2.2)	37.8	13.1	1	0
22-28 June	13.6	6.2	9.9 (+1.2)	2.4	17.1	0	0
29-30 June	11.5	3.4	7.4 (-2.4)	2.2	8.3	0	0
1-30 June	**14.3 (+0.5°C)**	**5.3 (+1.8°C)**	**9.8 (+1.1°C)**	**77.6 (119%)**	**115.1 (76%)**	**3**	**0**
LTA 1986-2019	**13.8**	**3.5**	**8.7**	**65.0**	**151.9**	**12.1**	**5.2**

Sunshine

115.1 hours sunshine for June was 76% of the long term average (LTA) of 151.9 hours (1986-2019). This is the tenth lowest June sunshine total on record for Blenheim for the 91 years 1930 to 2020. June 2020 recorded 55 hours less sunshine than June 2019.

June 2019 recorded 170.1 hours sunshine
June 2018 recorded 150.9 hours sunshine
June 2017 recorded 162.7 hours sunshine

Total sunshine for the first six months of 2020 was 1285.9 hours; 103% of the LTA (1241.8 hours).

One year ago I highlighted that the 12-months from July 2018 to June 2019 had recorded the second highest sunshine total on record. Despite June 2020 recording a very low sunshine total, the 12-month period July 2019 to June 2020 has recorded the sixth highest total for the 90 years 1930-31 to 2019-20. Remarkably, of the six highest 12-month July to June sunshine totals on record (1930-2020), four of these years have occurred since 2014-15 (Figure 1). The graph shows that despite there being marked differences in annual sunshine totals that the overall trend is that Blenheim has become slightly sunnier over the past 90 years.

Top six sunniest July to June 12-month periods for Blenheim, for the 90 years 1930-31 to 2019-20

2015-16 = 2781.0 hours
2018-19 = 2713.3 hours
2014-15 = 2691.8 hours
1972-73 = 2687.4 hours
2002-03 = 2655.2 hours
2019-20 = 2653.3 hours

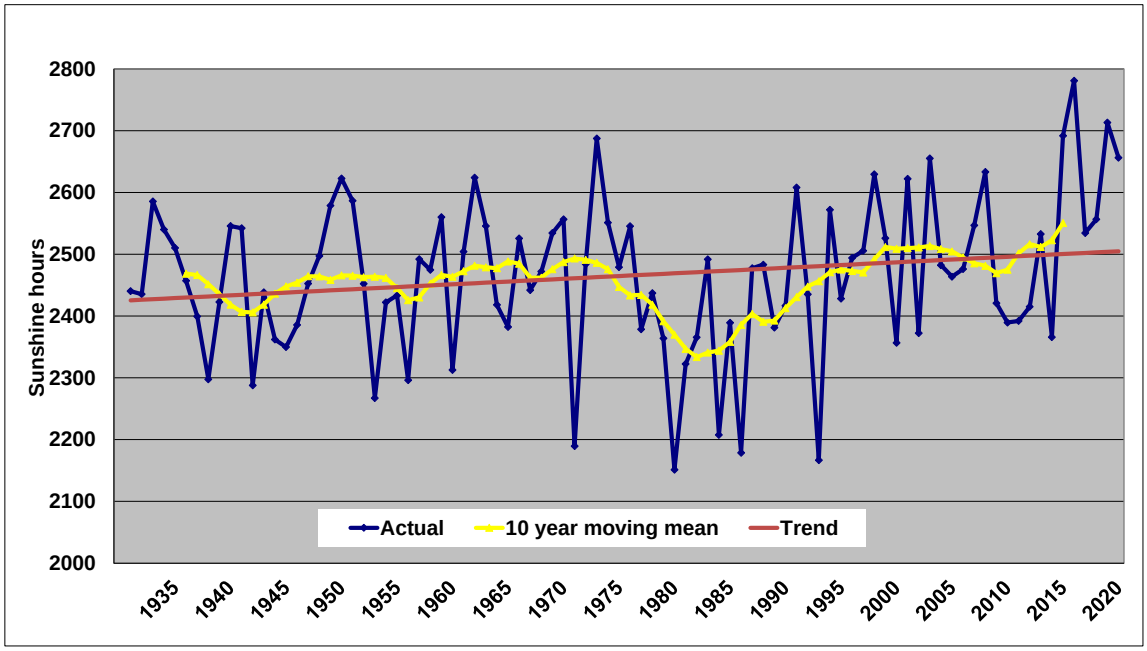

Figure 1: Annual sunshine totals for Blenheim for the 12-months July to June over the 90 years 1930-31 to 2019-20

Temperature

June's mean temperature of 9.8°C was 1.1°C above the LTA temperature of 8.7°C (1986-2019). As June is mid-winter one can hardly describe temperatures as being warm. However, when compared with the previous three years (2017-2019), the June 2020 mean temperature was quite a lot warmer. Why? The very overcast weather in June meant that the overnight minimum temperatures generally stayed fairly warm; i.e. there were very few ground frosts. Cloud cover traps heat and stops the overnight temperatures dropping as low as on cloudless frosty nights.

June 2019 mean temperature was 8.5°C
June 2018 mean temperature was 8.6°C
June 2017 mean temperature was 8.8°C
June 2016 mean temperature was 10.1°C

June 2020 is the seventh warmest June on record for the 89 years 1932 to 2020. Six of the seven warmest June's on record have been since 2002 (Figure 2). The red trend line in Figure 2 indicates how much warmer June is now in 2020 compared to the 1930s and 1940s. June has warmed by about 2.3°C over the past 89 years.

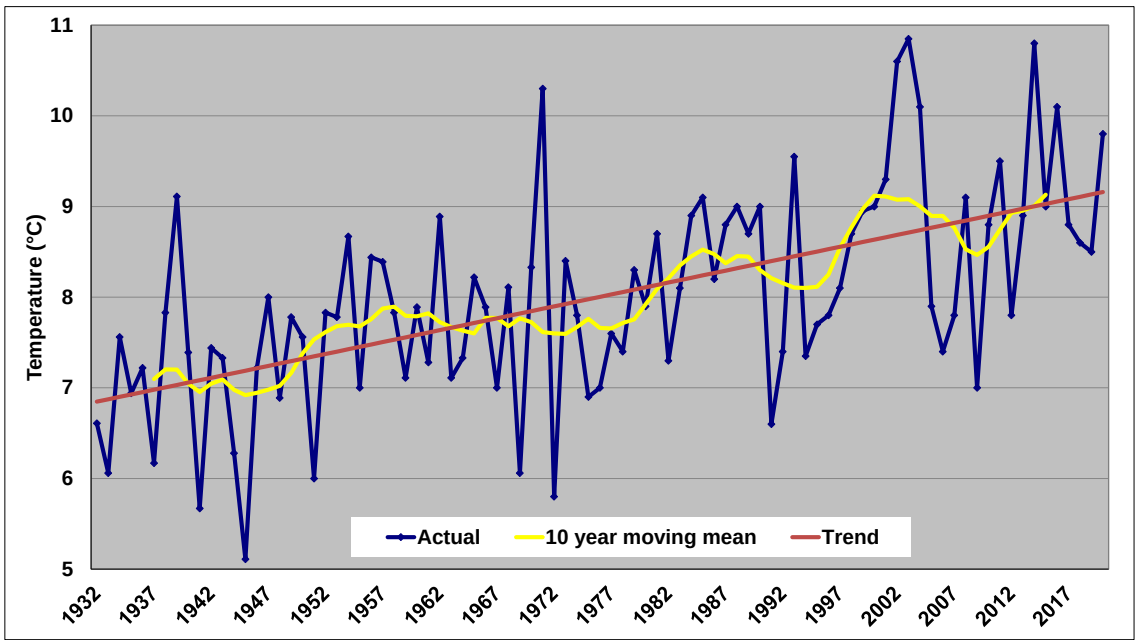

Figure 2: Mean June temperatures in Blenheim over the 89 years 1932 to 2020

The average daily maximum temperature of 14.3°C was 0.5°C above average. (June 2019 avg. max was 14.2°C).
The average daily minimum temperature of 5.3°C was 1.8°C above average. (June 2019 avg. min was 2.7°C).
The average daily range in temperature of 9.0°C was 1.1°C below average. (June 2019 range was 11.5°C).

Ground Frosts	**Air Frosts**
June 2020 = 3	0
June 2019 = 15	7
June 2018 = 13	5
June 2017 = 10	1
June 2016 = 10	1
L.T.A. = 12.1	5.2

The fact that June 2020 only recorded three ground frosts is quite remarkable. Only June 2014 with two ground frosts has recorded less in the 89 years 1932 to 2020. Three ground frosts in June 2020 is in marked contrast with 15 recorded in June 2019.
The coldest ground frosts in June 2020 were -1.4°C, recorded on three consecutive days 13th, 14th and 15th June. In contrast the coldest ground frost last year was a chilly -5.4°C on 2 June 2019.

No air frosts were recorded in June (no air temperatures below zero). This is only the second time in 89 years that June has not recorded an air frost. The only other year is 2014.
The coldest morning was 13 June 2020 with an air minimum of +0.7°C and a ground frost of -1.4°C.

Rainfall
Total rainfall in June of 77.6 mm was 119% of the LTA (1986-2019) for June of 65.0 mm.
June 2019 rainfall was 18.0 mm.
June 2018 rainfall was 39.4 mm.
June 2017 rainfall was 18.4 mm.
June 2016 rainfall was 76.8 mm.

January to June 2020 recorded 203.4 mm, 66% of the LTA of 308.3 mm.
January to June 2019 recorded 259.6 mm, 84% of the LTA.
January to June 2018 recorded 492.2 mm, 159% of the LTA.

Rainfall for the 12 months July 2019 to June 2020
One year ago I detailed how the monthly rainfall totals over the 12-months from July 2018 to June 2019 varied from very low to very high. The same is true for the 12 month period July 2019 to June 2020.

In the past 12 months, five months recorded low rainfall (October, January, February, March and April). Four months recorded close to average rainfall (August, September, November and June). Three months recorded well above average rainfall (July, December and May).

Total rainfall for the 12 months July 2019 to June 2020 was 604.8 mm. This is 94% of the long-term average (641.8 mm).
July 2018 to June 2019 = 577.0 mm (90% of LTA)
July 2017 to June 2018 = 740.6 mm (115% of LTA)
July 2016 to June 2017 = 608.2 mm (95% of LTA)
July 2015 to June 2016 = 491.2 mm (76% of LTA)
July 2014 to June 2015 = 347.4 mm (54% of LTA)

Although the 12-month rainfall total was only slightly below average, the rainfall distribution over the 12-month period was very uneven (Figure 3). The first six months, July to December 2019 recorded 401.4 mm rain, 120% of

the LTA. The second six months, January to June 2020 recorded 203.4 mm rain, 66% of the LTA. The four month rainfall total from January to April 2020 was only 44.2 mm, 24% of the LTA.

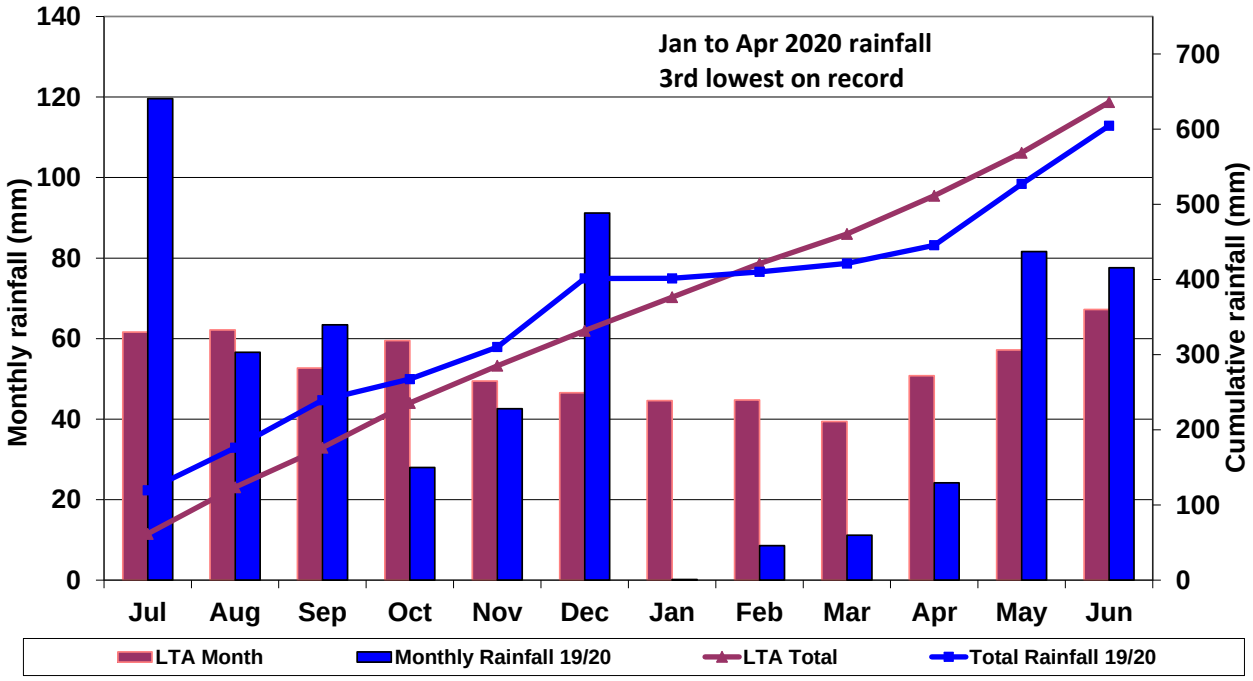

Figure 3: Monthly and cumulative rainfall in Blenheim for the 12-months July 2019 to June 2020 compared to the long term average

Wind

Average daily wind run for June 2020 was 181.2 km, with an average wind speed of 7.6 km/hr. This was well below the long-term average wind-run for June of 222.3 km and wind speed of 9.3 km/hr (1996-2019). June has only recorded above average wind-run in one year out of the last 10 years (2011 to 2020).

Rob Agnew
Plant & Food Research / Marlborough Research Centre

MARLBOROUGH RESEARCH CENTRE
Te Rito Hiranga o Wairau