



## Marlborough meteorological services

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# 1 Introduction

Blenheim's weather station is located at the Grovetown Park campus of the Marlborough Research Centre (Figure 1). Data from the Blenheim weather station and Dashwood weather station in the lower Awatere Valley are summarized monthly and made available, free of charge, on the Marlborough Wine Research Centre website [www.wineresearch.org.nz](http://www.wineresearch.org.nz).



Figure 1. Blenheim weather station located at Grovetown Park campus of the Marlborough Research Centre.

## 2 Rainfall

Marlborough is one of the drier regions of New Zealand. The long-term rainfall record for the 71 years 1930 – 2000 (Table 1) indicates that rainfall is evenly spread throughout the year, with average monthly rainfall of between 45 and 66 mm. However, the average monthly rainfall data conceal the fact that in any one month, rainfall can often be as low as 20% of average or as high as 250% of average. The data in Table 1 indicate that for the most recent four years, that in 24 of the 48 months, rainfall was either less than half or more than twice the long-term monthly average. It is also not uncommon for Marlborough to go from a period of very low rainfall to a period of very high rainfall or vice versa.

For the third year in a row, total rainfall for the 12 months July-June was above average (Table 1). In each of these years, well above average rainfall has occurred at some point in the growing season, preventing a drought. The 2009/2010 year finished with record-breaking high rainfall in May and June 2010. This rain ensured that pastoral dryland farms in Marlborough experienced some of the best ever spring growing conditions in 2010, with plenty of available soil moisture and warm temperatures ensuring abundant grass growth. Soil moisture was

boosted again in late December 2010 with very high rainfall and then again in April and May 2011.

Table 1. Blenheim rainfall comparison over the past four seasons, 2007/2008 – 2010/2011.

Month	LTA <sup>1</sup>	Rain	Rain	Rain	Rain
	1930-2000 mm	2007-2008 mm	2008-2009 mm	2009-2010 mm	2010-2011 mm
July	66	53.6	152.6	50.8	57.6
August	64	42.6	131.4	82.2	83.2
September	51	35.4	75.8	50.2	93.0
October	55	90.8 <sup>2</sup>	73.4	115.4	24.0
November	48	8.8	54.4	32.2	27.0
December	47	63.0	76.0	19.8	131.6
January	50	19.4	10.0	40.6	40.2
February	45	26.0	98.2	6.4	11.8
March	46	51.2	10.0	32.8	30.6
April	53	113.0	56.2	7.2	67.6
May	65	4.0	32.8	167.2	120.0
June	57	25.2	52.2	154.2	61.6
<b>Total</b>	<b>647</b>	<b>533</b>	<b>823</b>	<b>759</b>	<b>748.2</b>
<b>% of LTA</b>		<b>82%</b>	<b>127%</b>	<b>117%</b>	<b>116%</b>

<sup>1</sup> LTA – long-term average

<sup>2</sup> Months highlighted yellow recorded a rainfall total of either less than 50% or greater than 150% of the LTA monthly rainfall

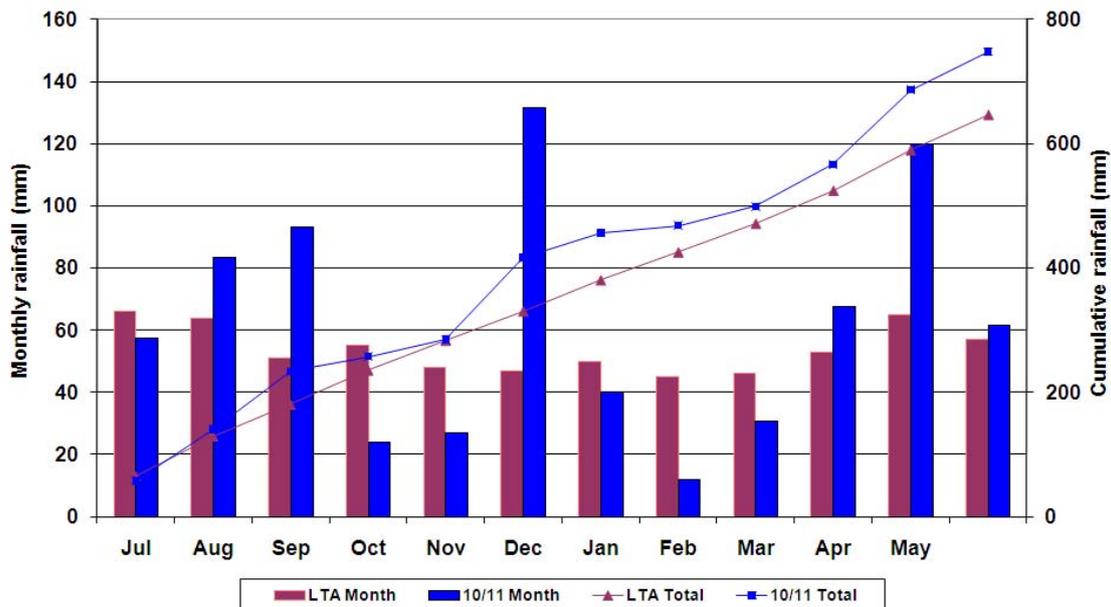


Figure 2. Blenheim monthly and total rainfall - July 2010 to June 2011.

### 3 Temperature and growing degrees

Temperature and growing degree-day (GDD) data for the past two seasons are presented in Table 2. The mean temperature for the twelve months July 2010 – June 2011, of 13.7°C, was 0.6°C above the long-term average of 13.1°C (1986--2010). Table 1 indicates that values in seven of the twelve months for 2010/2011 were more than 0.5°C above average. Values in the 2009/2010 season were also above average, but not in the main months of the growing season, November to February.

The past season was the warmest of the most recent twelve years. To find previous seasons with recorded similar mean temperatures, we have to look back to the two warm seasons of 1997/1998 (13.7°C) and 1998/1999 (13.8°C).

Table 2. Blenheim monthly temperature and growing degree-day summary, for the past two seasons in comparison with the long-term average.

	LTA <sup>1</sup> Mean (1986-2010)	09/10 Mean	10/11 Mean	LTA GDD <sup>2</sup> (1996-2010)	09/10 GDD	10/11 GDD
July	7.8	7.3	7.7	22.6	16.2	15.2
August	9.0	10.9 <sup>3</sup>	10.1	34.1	56.0	37.5
September	11.1	10.8	12.2	71.3	64.6	74.7
October	13.0	11.4	12.4	109.5	71.0	89.0
November	14.6	14.9	15.5	141.5	139.5	166.1
December	16.7	17.2	18.2	206.0	211.3	237.6
January	18.1	18.5	18.1	238.6	242.4	240.0
February	17.8	18.0	18.6	216.0	210.6	230.1
March	16.0	16.9	16.2	195.6	208.1	190.0
April	13.3	14.9	12.7	112.2	152.0	88.9
May	11.1	11.3	12.8	70.5	63.7	94.3
June	8.6	8.8	9.5	34.2	23.3	29.9
<b>Total</b>				<b>1452.2</b>	<b>1458.7</b>	<b>1493.3</b>
<b>Mean</b>	<b>13.1</b>	<b>13.4</b>	<b>13.7</b>			

<sup>1</sup> LTA – long-term average      <sup>2</sup> GDD – growing degree days

<sup>3</sup> Months highlighted blue or red are more than half a degree cooler or warmer than the LTA respectively.

Figure 3 displays the deviation in growing degree-days from the long-term average. The long-term average growing degree-day line is plotted through zero. When temperatures are warmer than average, the line slopes upwards and when cooler than average, the line slopes downwards. Two contrasting seasons are included at the bottom and top of Figure 3. In the 1996/1997 season, temperatures were below average for the six months from November 1996 through to April 1997 and the GDD line tracked steadily downwards. GDD in 1997/1998 started slowly from September to November 1997, but from mid January 1998 onwards it was very hot.

The 2010/2011 season (red) began in very similar fashion to the 2009/2010 season (light blue), with cold weather during October and early November. The consequence of this was that the early development of some crops was delayed. In early November 2010, it appeared as if flowering of grapes in Marlborough was going to be much later than normal. However, on 12 November 2010, it was as if a switch was turned on and the cool weather was replaced by very warm weather that lasted right through until early February 2011. This prolonged warm weather ensured that the grape harvest was slightly earlier than normal, despite temperatures from mid February and during March 2011 being only average.

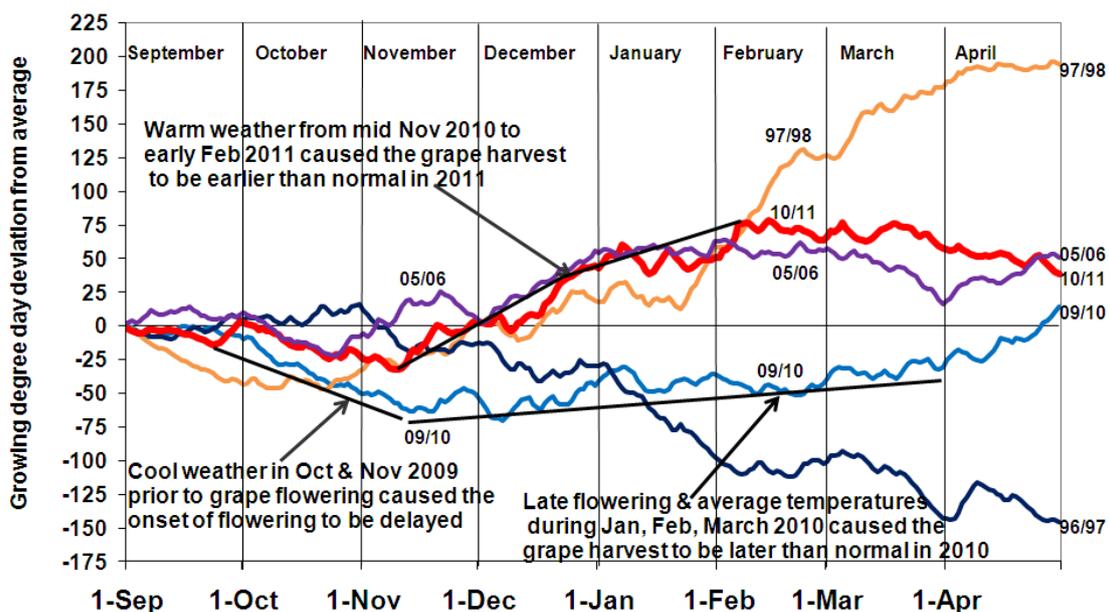


Figure 3. Growing degree-days for Blenheim: days ahead (+) or behind (-) average (The text and arrows contrast the 2009-2010 and 2010-2011 growing seasons)

## 4 Wind-run

Wind-run is the total of wind recorded over a 24-hour period, measured in km. The average daily wind speed (km/h) is total wind run divided by 24. The easiest way to envisage daily wind-run is to imagine the distance a balloon would be able to travel in a 24-hour period. Since 1996, wind-run at the Blenheim meteorological station has been recorded electronically, with an anemometer on top of the ten-metre high mast (Figure 1, centre). This is the standard international height for measuring wind. However, before 1996, wind was recorded with a manual anemometer at a height of approx. six metres (Figure 1, right hand corner). It is not possible to compare directly the values recorded manually before 1996, with those recorded electronically since 1996, because of the different height of recording.

The 12 months from July 2010 to June 2011 recorded the lowest wind run for the 15-year period 1996/1997 - 2010/2011, only 88% of the long-term average (Table 3). Eleven of the 12 months recorded less wind-run than average. June 2011 recorded the lowest wind-run for the 12 months and also the lowest June total on record.

Table 3. Average daily wind-run for Blenheim in 2010/2011, in comparison with the long-term average.

Month	1996-2010 LTA <sup>1</sup> km	2010-2011 km	2010-2011 % of LTA <sup>1</sup>
July	231.2	196.9	85%
August	245.7	207.1	84%
September	289.4	351.7	122%
October	307.9	280.9	91%
November	313.5	240.4	77%
December	306.6	271.7	89%
January	281.1	262.7	93%
February	264.7	224.5	85%
March	263.9	221.2	84%
April	231.0	191.0	83%
May	222.0	201.3	91%
June	235.5	165.5	70%
Annual	266.1	234.6	88%

<sup>1</sup> LTA – long-term average

Blenheim is situated in the central Wairau Plains, nine kilometres from the coast. The Wairau plains are very sheltered from strong southerly winds. The coastal Kaikoura ranges deflect southerly winds up the coast and through Cook Strait. It can often be a relatively calm sunny day in Blenheim, while a short distance away a strong southerly is being experienced in Cook Strait. Those who work outdoors in the Awatere Valley south of Blenheim, often complain about the incessant wind, in comparison with those in the Wairau Valley. The Dashwood weather station in the lower Awatere Valley experiences 140% of the wind-run of Blenheim. It is no coincidence that the Dominion Salt evaporation ponds are located at Lake Grassmere, right on the coast and close to Cape Campbell. The Blenheim and Dashwood wind-run figures are put into a completely different context when compared with the average daily wind-run recorded at Cape Campbell on the coast. Average annual daily wind-run for Blenheim, Dashwood and Cape Campbell are 268 km, 379 km and 658 km respectively (Figure 3). Cape Campbell records 245% of Blenheim wind-run. At the Blenheim weather station it is calm approximately 50% of the time whereas at Cape Campbell it is calm approximately 3% of the time. The windiest day in Blenheim records less wind than the calmest day at Cape Campbell.

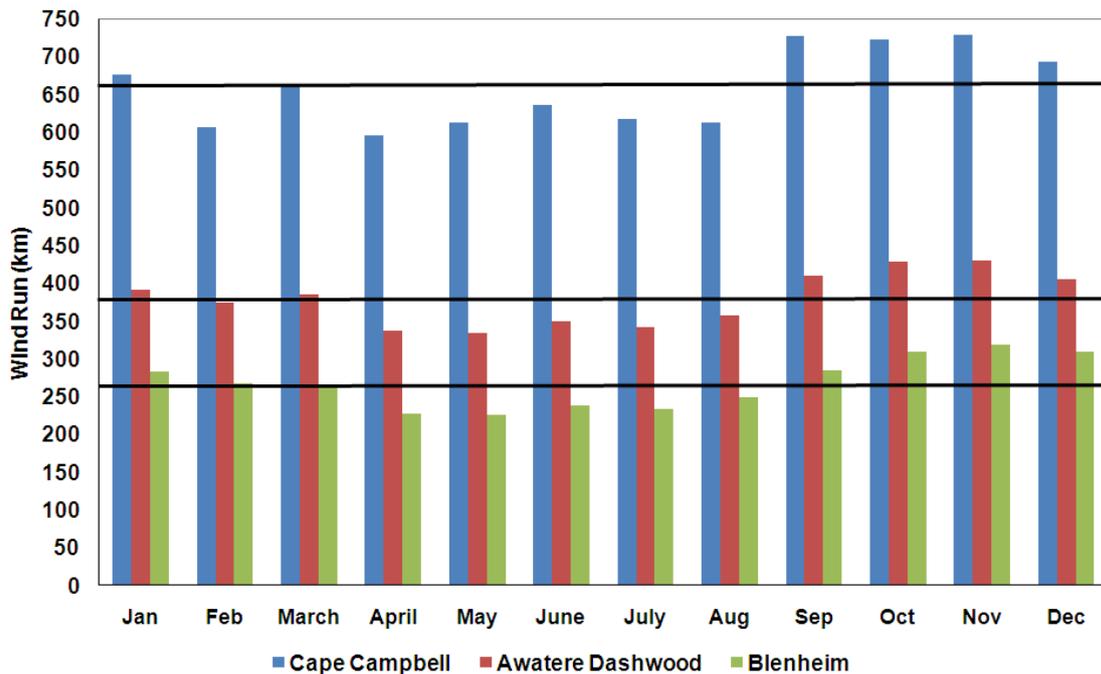


Figure 3. Comparison of wind-run for Blenheim, Dashwood and Cape Campbell.

## 5 Dissemination of information from this project

- Monthly meteorological summaries for the Blenheim and Dashwood weather stations were posted on the Marlborough Wine Research Centre website in the first few days of the new month. These summaries were viewed on the website by approximately 50 people each month.
- Press releases were sent to local media at the beginning of each month, outlining details of the previous month's weather. These summaries provide the basis for newspaper and radio articles.
- Meteorological Report in Winepress July 2010 – June 2011 Issue Numbers 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204.
- The Vinefax service to subscribing Marlborough grape growers completed its fifteenth season of operation.

## 6 Key funding sources and collaborating companies

Marlborough Research Centre  
 Plant & Food Research  
 Pernod Ricard New Zealand Limited  
 Cloudy Bay Vineyards.