

**National Climate Summary – June 2006**

**Severe winter snowstorms hit Canterbury and the central North Island**

**Temperature: Coldest June since 1972**

**Sunshine: Well above average in western and southern regions; record June totals in Northland, Auckland, Waikato, Taranaki and coastal Otago**

**Precipitation: Above average in many eastern regions, especially South Canterbury; below average in Bay of Plenty**

Two severe winter snowstorms accompanied by bitterly cold conditions, and later heavy frost contributed to a particularly cold June. The national average temperature of 7.3 °C was 1.2 °C below the 1971-2000 normal. This was the coldest June since 1972 which recorded 6.7 °C. The regions with the largest anomalies, more than 2.0 °C below average, were Waikato, King Country, inland Marlborough, South Canterbury, and North Otago. Parts of South Canterbury and North Otago recorded their lowest June mean temperatures in more than 50 years of record. One snowstorm hit Canterbury over 11-12 June, producing snow depths of 15 – 90 cm. The other affected the central North Island over 20-22 June. These were accompanied by bitterly cold conditions, and later heavy frost. There were more days than average in June with air frost over much of New Zealand, especially in the central North Island and the southeast of the South Island. Precipitation was about 200 percent (twice) of normal in South Canterbury. In contrast, June rainfall totals were 50 percent (half) or less of normal in much of Bay of Plenty. June was much sunnier than normal in all western and southern regions, with record high June totals in Northland, Auckland, and Waikato, and coastal Otago. Anticyclones ('highs') were much more frequent than average for June in the Australian Bight with ridges of high pressure extending into the south Tasman Sea. This pattern resulted in frequent cold southerly winds over New Zealand.

**Other Highlights:**

The highest temperatures recorded during June 2006 were 20.5 °C recorded at both Kaikoura on 11 June, and Hastings on 12 June. The lowest air temperatures for the month were -14.0 °C recorded at both Tara Hills, Omarama on the 14<sup>th</sup>, and Fairlie on the 28<sup>th</sup>. The minimum air temperatures were -10 °C or lower in parts in inland South Canterbury and/or North Otago, on nine days between 14 and 29 June.

A tornado damaged property in Greymouth on 11 June. Northwest gales buffeted the North Island on 12 June, with damage and power outages in parts of Auckland, Thames-Coromandel, Waikato, and the Marlborough Sounds. Trees fell in Tauranga, with other wind damage in Kaitoke and Nelson. A wind gust of 146 km/h from the north was recorded at Mt. Kaukau, Wellington. Power lines were damaged by wind in Taranaki, Bay of Plenty, and Gisborne, on 19 June, with power cut to thousands of residents. Several iron roofs were damaged in Gisborne, and New Plymouth.

A severe, widespread heavy snowfall event occurred in Canterbury over the night of 11/12 June, especially in the south, snow settling to depths of 75-90cm around Fairlie and Burkes Pass, almost 40cm in Ashburton, and more than 20cm in Timaru, some remaining in some inland areas until the 27<sup>th</sup>. Extended power cuts occurred throughout much of South Canterbury, due to broken power lines and poles. The roofs of several buildings also collapsed, due to the weight of snow. Many motorists were stranded in the snow, and many roads closed. Southerlies spread over the North Island over 20-22 June, bringing heavy snowfall down to 500m, affecting the Desert Road, and townships of Waiouru, Ohakune, National Park, and the outskirts of Taupo, with many roads closed, including those to the east coast. Two buses slid off icy roads in the Central North Island, and nearly 100 cars were stranded in the snow.

High rainfall events were frequent in June, occurring in various districts on 3, 10-12, 15, 18-19, and 22 June. 20 houses were evacuated due to flooding in Runanga north of Greymouth on 11 June.

Christchurch was the driest, Wellington the wettest, Auckland the sunniest, and Christchurch the coldest

of the main centres. Sunshine hours were near average in Christchurch, record high in Auckland, Hamilton and Dunedin, and well above average in Wellington. Rainfall was above average in Christchurch, below average in Dunedin, and near average in Auckland, Hamilton, and Wellington. Temperatures were below average in all five main centres.

**Temperature:** Mean temperatures were 1.0 to 2.0 °C below average over much of the North Island, and 0.5 to 1.5 °C below average over much of the South Island. The regions with the largest anomalies, more than 2.0 °C below average, were Waikato, King Country, inland Marlborough, South Canterbury, and North Otago. It was particularly cold and frosty at night.

**Rainfall:** Rainfall was about 200 percent (twice) of normal in South Canterbury, and also above normal in the east of the North Island from Gisborne to Wairarapa, as well as Wanganui, North Westland, coastal Marlborough, and North Canterbury. In contrast, June rainfall totals were 50 percent (half) or less of normal in much of Bay of Plenty, and below normal in much of Northland, Thames-Coromandel, North Taranaki, Nelson, Fiordland, and coastal areas of Otago.

**Sunshine:** Sunshine hours and/or solar radiation were at least 120 percent of normal in much of the western North Island from Northland to Wellington, as well as Westland, coastal Otago, and Southland, and at least 110 percent of normal in most other regions. Record high June totals occurred in the north of the North Island and coastal Otago.

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## TEMPERATURE: BELOW AVERAGE

Mean temperatures were 1.0 to 2.0 °C below average over much of the North Island, and 0.5 to 1.5 °C below average over much of the South Island. The regions with the largest anomalies, more than 2.0 °C below average, were Waikato, King Country, inland Marlborough, South Canterbury, and North Otago. Parts of South Canterbury and North Otago recorded their lowest June mean temperatures in more than 50 years of record. It was particularly cold and frosty at night, with mean overnight minima about 2.5 to 3.0 °C below average in many northern, and western locations in the North Island, as well as Wairarapa, inland South Canterbury, and Otago.

**Low June mean temperatures were recorded at:**

Location	June Mean air temperature (°C)	Departure from normal (°C)	Year Records began	Comments
Kerikeri EWS	10.4	-1.5	1982	2 <sup>nd</sup> lowest
Whangarei Airport	10.7	-1.6	1968	2 <sup>nd</sup> lowest
Warkworth	9.3	-1.9	1972	Lowest
Auckland, Henderson	9.5	-1.5	1986	Lowest
Auckland, Owairaka	9.8	-1.8	1949	Equal lowest
Rotorua Airport	6.7	-1.7	1964	Equal 2 <sup>nd</sup> lowest
Taupo Airport	5.6	-1.7	1976	Lowest
Hamilton, Ruakura	7.7	-1.7	1907	Well below normal
Hamilton Airport	7.2	-2.0	1971	2 <sup>nd</sup> lowest
Port Taharoa	10.3	-1.5	1982	Lowest
Te Kuiti	7.1	-2.1	1959	2 <sup>nd</sup> lowest
Taumarunui	5.8	-2.3	1947	2 <sup>nd</sup> lowest
Lower Retaruke	5.9	-2.0	1967	3 <sup>rd</sup> lowest
Stratford	6.3	-1.9	1960	Lowest
Castlepoint	9.0	-1.8	1973	Lowest

Palmerston North	7.4	-1.8	1928	Well below normal
Levin	7.4	-1.7	1896	Well below normal
Waiouru MWD	3.2	-1.7	1962	3 <sup>rd</sup> lowest
Wanganui Airport	8.6	-1.6	1979	2 <sup>nd</sup> lowest
Hanmer Forest	2.5	-2.2	1906	Well below normal
Lake Tekapo	0.0	-2.5	1927	Equal 2 <sup>nd</sup> lowest
Fairlie	1.1	-2.8	1925	Lowest
Timaru Airport	4.0	-1.5	1962	Lowest
Tara Hills, Omarama	-0.1	-2.5	1950	Lowest

### SUNSHINE: WELL ABOVE AVERAGE IN WESTERN AND SOUTHERN REGIONS

Sunshine hours and/or solar radiation were at least 120 percent of normal in much of the western North Island from Northland to Wellington, as well as Westland, coastal Otago, and Southland, and at least 110 percent of normal in most other regions. New June record high sunshine totals occurred in parts of Northland, Auckland, Waikato, and coastal Otago.

#### High June sunshine hours were recorded at:

Location	June Sunshine (hours)	Percentage of normal	Year records began	Comments
Dargaville	150	165	1943	Highest
Auckland, Mangere	165	148	1963	Highest
Hamilton, Ruakura	167	162	1936	Highest
Taumarunui*	89	130	1947	Well above normal
New Plymouth	170	144	1915	Highest since 1922
Paraparaumu Airport	152	151	1953	2 <sup>nd</sup> highest
Palmerston North	116	138	1930	Well above normal
Stratford	141	139	1963	Highest
Takaka	182	134	1986	2 <sup>nd</sup> highest
Hokitika Airport	140	137	1964	Well above normal
Tekapo**	133	137	1928	Well above normal
Dunedin, Musselburgh	153	177	1948	Highest
Invercargill Airport**	95	124	1932	Well above normal

\* 28 days \*\* 29 days

### PRECIPITATION: ABOVE IN MANY EASTERN REGIONS, AS WELL AS WANGANUI, AND PARTS OF WESTLAND AND MARLBOROUGH; BELOW AVERAGE IN BAY OF PLENTY

Precipitation was about 200 percent (twice) of normal in South Canterbury, and at least 125 percent (one and a quarter) of normal in the east of the North Island from Gisborne to Wairarapa, as well as Wanganui, North Westland, coastal Marlborough, and North Canterbury.

#### High June rainfall was recorded at:

Location	June Rainfall (mm)	Percentage of normal	Year Records began	Comments
Winchmore	123	195	1947	Well above normal
Lake Tekapo	112	194	1925	Well above normal
Timaru Airport	91	219	1957	Well above normal

June rainfall totals were 50 percent (half) or less of normal in much of Bay of Plenty, and 75 percent (three quarters) or less of normal in much of Northland, Thames-Coromandel, North Taranaki, Nelson, Fiordland,

and coastal areas of Otago.

## JUNE'S CLIMATE IN THE FIVE MAIN CENTRES

Christchurch was the driest, Wellington the wettest, Auckland the sunniest, and Christchurch the coldest of the main centres. Rainfall was above average in Christchurch, below average in Dunedin, and near average in Auckland, Hamilton, and Wellington. Temperatures were below average in all five main centres. Record June sunshine totals occurred in Auckland, Hamilton, and Dunedin, with near average totals in Christchurch, and well above average totals in Wellington.

Location	June. Mean Temp. (°C)	Dep. from normal (°C)		June. rainfall (mm)	% of Normal		June. Sunshine (hours)	% of Normal	
Auckland	9.8	-1.8	Well below average	117 <sup>a</sup>	84	Near average	165	148	Record high
Hamilton	7.7	-1.7	Well below average	96	82	Near average	167	162	Record high
Wellington	8.6	-0.9	Below average	144	98	Near average	123	125	Well above average
Christchurch	5.0	-1.2	Below average	92 <sup>b</sup>	149	Above average	127 <sup>b</sup>	107	Near average
Dunedin	5.9	-1.2	Below average	39	54	Below average	155	177	Record high

<sup>a</sup> Owhairaka    <sup>b</sup> Christchurch Airport

## HIGHLIGHTS AND EXTREME EVENTS

### Temperature

The highest temperatures recorded during June 2006 were 20.5 °C recorded at both Kaikoura on 11 June, and Hastings on 12 June.

The lowest air temperatures for the month were -14.0 °C recorded at both Tara Hills, Omarama on the 14<sup>th</sup> (the lowest on record there for June in measurements that commenced in 1950), and Fairlie on the 28<sup>th</sup> (equal lowest on record there for June in measurements that commenced in 1931). The minimum air temperatures were -10 °C or lower in parts in inland South Canterbury/North Otago, on 14-15, 20-22, 25-26, and 28-29 June.

Near or record low June air temperatures were recorded at:

Location	Minimum air temperature	Date of occurrence	Records began	Comments
Hanmer Forest	-11.0	28 June 2006	1946	2 <sup>nd</sup> lowest for June
Tara Hills, Omarama	-14.0	14 June 2006	1950	Lowest for June
Fairlie	-14*	28 June 2006	1925	Equal lowest for June
Lake Tekapo	-13.5	25 June 2006	1927	3 <sup>rd</sup> lowest for June

\* rounded to the nearest whole number

Near or record low June minimum grass temperatures (ground frost) were recorded at:

Location	Minimum grass temperature	Date of occurrence	Records began	Comments
Auckland, Henderson	-7.9	27 June 2006	1986	2 <sup>nd</sup> lowest
Invercargill Airport	-11.2	27 June 2006	1910	3 <sup>rd</sup> lowest for June

### High winds

A wind gust of 146 km/h from the north was recorded at Mt. Kaukau, Wellington on 12 June. Damaging wind events during June were:

Date of occurrence	High wind gusts
11 June	A tornado damaged almost 20 properties in Greymouth. A wind gust to 93 km/h was recorded from the west at Hokitika Airport.
12 June	Wind damage resulted in power outages in central Auckland, Thames-Coromandel, Waikato, and parts of the Marlborough Sounds. Trees fell in Tauranga, with other wind damage. A house roof was lifted by the wind in Kaitoke. A yacht broke its mooring in Nelson. Wind gusts to 91 km/h were recorded from the north or northwest at Auckland Airport, 87 km/h at Tauranga Airport, 146 km/h at Mt. Kaukau, and 82 km/h at Nelson Airport.
19 June	Power lines damaged in Taranaki, Bay of Plenty, and Gisborne, with power cut to thousands of residents. Several iron roofs were damaged in Gisborne, and New Plymouth. Wind gusts to 98 km/h were recorded from the southeast at New Plymouth Airport, 76 km/h at Tauranga Airport, and 80 km/h at Gisborne Airport.

### High rainfall and floods

There were several events with high rainfall during June. These were:

Date of occurrence	Rainfall totals	Locations with flooding
3 June	Hokitika 123 mm, Arthurs Pass 74 mm	
10 June	Milford Sound 67 mm	
11 June	Arthurs Pass 234 mm, Franz Josef 164 mm, Hokitika 151 mm, Greymouth 145 mm, Mt. Cook Village 120 mm, Reefton 117 mm	20 houses evacuated due to flooding in Runanga north of Greymouth, flooding also in Brunner and Dobson.
12 June	Motu 86 mm	Surface flooding in parts of Christchurch city
15 June	Milford Sound 85 mm, Mt. Cook Village 68 mm, Arthurs Pass 67 mm, Manapouri 65 mm	
18 June	Paraparaumu Airport 15 mm in 20 minutes	Heavy rain with surface flooding in Paraparaumu
19 June	Motu 105 mm, Hicks Bay 90 mm, Gisborne 87 mm	
22 June	Wairoa 77 mm, Gisborne 66mm	

### Snowfall

Snow settled at the summit of the Rimutaka Hill Road, north of Wellington, to depths of several cm on 5 June, and down to about 600 m elsewhere in the region. Meanwhile, 15 cm of fresh snow settled at Mt. Hutt Skifield further south.

A mid-Tasman depression deepened on 11 June, its central region tracking over the north of the South

Island on 12 June. Heavy snowfall occurred in Canterbury, settling to sea level over the night of 11/12 June, especially in the south, remaining in some inland areas until the 27<sup>th</sup>.

**Reported snow depths:**

Location	Snow depth
Fairlie & Burkes Pass	75-90 cm
Mt Hutt Skifield	85 cm
Porter Heights	60 cm
Mt Dobson	50 cm
Treble Cone	35-60 cm
Cardrona	35-45 cm
Remarkables	20-40 cm
Coronet Peak	15-40 cm
North Canterbury foothills	30 cm
Ashburton	38 cm
Rakaia	30 cm
Timaru	24 cm
Rolleston	>15 cm
Dunsandel, Lincoln, Oxford, Rangiora, & Amberly	10-15cm
Darfield	40 cm
Belfast, Cashmere, & Brighton Beach	5-6 cm

Powers cuts occurred in many areas, including Geraldine, Temuka, Fairlie, Timaru and parts of Christchurch (affecting thousands of consumers), due to broken power lines and poles from the weight of snow. The roofs of several buildings also collapsed, or partly collapsed, due to the weight of snow. Power was still cut to hundreds on the 22<sup>nd</sup>, with 11 cm of snowfall still lying at Ashburton and further inland. Schools were closed and people were advised not to travel. Christchurch Airport was closed. This was the 5<sup>th</sup> event in which snow settled in Christchurch in the past 6 years. Many motorists were stranded near Waimate, and about 10 trucks were trapped in thick snow near Dunsandel (some for six hours). Many roads were closed, including SH6, 8, 9, 73, 82, SH1 from Ashburton to Oamaru, and the junction of SH1 between Ashburton and Timaru, along with the Lindis, Porters, and Arthurs Pass routes.

The same weather system produced gale force northerlies over the North Island during the night of 11/12 June, and heavy rainfall.

Further snowfall occurred in Canterbury, settling in inland areas, on 19 June, but it was not a heavy snowfall event there. However, southerlies spread over the North Island over 20-22 June, bringing heavy snowfall down to 500 m in the North Island, affecting the Desert Road, and townships of Waiouru, Ohakune, National Park, and the outskirts of Taupo. Snow and ice also resulted in the closure of SH5 at Eskdale, north of Napier. The Napier-Taihape, and Napier-Taupo roads was closed. Two buses slid off icy roads in the Central North Island, with nearly 100 cars stranded in the snow.

**Reported snow depths (for the 20-22 June 2006 North Island snowfall event) were:**

Location	Snow depth
Waiouru	Approx. 15cm

**Major snowfall events to affect Canterbury in the past include:**

17-18 June 2002: Mid Canterbury and Otago: Snowfall was 10-40cm deep in many areas. Christchurch airport was closed. SH1 was closed from Dunsandel to Temuka. Hundreds of travellers were stranded. Power lines failed due to the weight of snowfall in and near Ashburton. Snowfall was 1m deep at Mt.Cook Village.

27-29 August 1992: This event affected the entire South Island east coast. Snowfall was 25cm deep in parts of Christchurch City, and 40cm deep at Darfield. This was the most severe Canterbury snowstorm since 1945.

16-18 November 1967: This event affected the Central North Island and the South Island, especially inland south Canterbury and North Otago. It was worst in the Mackenzie Country, where snowfall was 60-90cm deep. 60-70,000 sheep died. At the time, this was the worst Canterbury snowfall since 1945, and reported as worst in living memory for any month of the year at some sites. It was very unseasonable. There were electricity outages. 30 hay-barns and other buildings collapsed under the weight of snowfall. Crops were flattened. Extensive damage occurred to glasshouses. Fairlie was completely isolated. Disruptions occurred to transport and communications. Power and telephone lines were down, and secondary roads blocked for several days.

5-6 August 1973: This event affected the upper Canterbury Plains, the Mackenzie Basin, and North Otago. 100,000 sheep and 3,000 cattle were killed, due to exposure, in spite of a large rescue operation. Snowfall was 90cm deep at Methven, but twice that deep at Sherwood downs (north of Fairlie). This was the heaviest snowfall in those areas since July 1945. Extensive disruption of communications, power supply, and transport occurred. Secondary roads were blocked for several days.

13-18 July 1945: Snowfall 30-45cm deep around Christchurch, Ashburton, and Timaru. This was one of the worst snowstorms on record.

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