

13 JANUARY 2009

New Zealand national climate summary – the year 2008

2008: sunny and warm, but a rollercoaster year for extremes

New Zealand's climate for 2008 was sunny and warm, but a rollercoaster year for extremes, according to NIWA's National Climate Centre.

It was sunny or very sunny over much of the country, with near record or record sunshine totals recorded in the central North Island, parts of Hawke's Bay and the south of the South Island. The national average temperature was of 12.9°C during 2008, milder than normal. This was a result of five warm months with above average temperatures for the country as a whole and only one with below average temperatures. Temperatures were between 0.5 and 1.0°C above average in the west of the North Island and Nelson, and up to 0.5 °C above average in most other regions. Rainfall during the year was 135 percent of normal or more in Wellington and central Marlborough. Only in parts of Fiordland and southern Hawke's Bay were annual rainfall totals 80 percent of normal or less.

Notable climate features in various parts of the country were the economically disastrous drought in the west of the North Island in the first part of the year (estimated costs of at least \$1 billion), then floods in central North Island areas causing loss of life, damaging floods in July and August in Marlborough and Canterbury, and a significant snow storm in August followed by some unusual late spring snowstorms. The July and August events have estimated insurance costs of \$68 million. By the end of the year, dry conditions had set in over the east of the country. It was a year with heat waves and many new records of high temperature extremes were established. Of the main centres, Wellington was extremely wet, and Dunedin very sunny and dry.

Over the year, the broad climate setting swayed from La Niña to neutral then back to La Niña. The start of the year was dominated by a significant La Niña event in the equatorial Pacific. This dissipated with neutral conditions during winter and early spring, but weak La Niña conditions redeveloped in the tropical Pacific by the end of the year.

The year in review

Broadly speaking, the picture of the year (with clear geographical exceptions) is:

- January–March: very dry
- April: extremes
- May: cold
- June–August: stormy
- September: more settled
- October–December: becoming dry again

January–March: very dry

In January, heat wave conditions occurred across inland areas of the South Island, and even extended to coastal parts of Canterbury and central Marlborough. Extremely low rainfall occurred in many

areas, with monthly totals of less than 10 mm in the Hauraki Plains, Waikato, King Country, coastal Marlborough and parts of north Canterbury. In Waikato it was the driest January in over 100 years of records. The dryness continued through February (50% or less of normal rainfall over much of the North Island from Manukau southwards, and in coastal Otago and parts of Southland) and March (30 to 50% of normal rainfall fell throughout Canterbury, Fiordland, Auckland, Waikato, the King Country and eastern Wairarapa). As a result, severe soil moisture deficits persisted in Waikato, parts of Bay of Plenty, South Taranaki and northern Manawatu, Hawke's Bay, Wairarapa, as well as Marlborough, and parts of south Canterbury, Otago and Southland.

April: extremes

April was a month of extremes with floods in northern New Zealand, while it remained dry in the south. Heavy rainfalls alleviated the severe and significant soil moisture deficits in most of the North Island.

May: cold

May was a cold month, with the national average temperature of 9.6°C being 1.1°C below average. This made it almost 4°C lower than mean air temperatures in April, and the coldest May since 1992.

June–August: stormy

In contrast to May, June was much warmer than average in places especially inland South Canterbury and Otago. The weather got very boisterous in late June, with thunderstorms, hail, lightning and high winds affecting much of the North Island.

July and August were very wet in many parts of the country. In July, rainfall was well above normal (more than 200%) in Marlborough, Canterbury, and eastern Otago, with near record high July totals in many locations. In the last week of July New Zealand was hit by two intense storms which caused flooding, significant damage to property, resulted in several evacuations, and led to the deaths of five people. Rainfall totals were greater than one and a half times their normal values for much of the North Island in August, and Marlborough received over 300% of its normal August rainfall. There were several storms during August bringing a mixture of snow, high winds and heavy rainfall to much of the country. On Mt Ruapehu the recorded 3.5 m of snow pack was the deepest snow base since records began in 1992.

September: more settled

September brought a shift back to much more settled weather conditions for the country. Temperatures were above average for the country as a whole and well above average (more than 1.5°C above their normal values) in South Canterbury and Central Otago. Rainfall in September was below normal for many areas, particularly in parts of Northland, Auckland, Waikato, Coromandel, and the east coast of the North Island where less than 50% of normal rainfall fell.

October–December: becoming dry again

Sunshine totals were well above average for most of the South Island in October, with Dunedin and Balclutha recording their highest October values on record. Rainfall was less than 50% of normal (half) in Otago and coastal south Canterbury and between 50 and 80% of normal in parts of northern Canterbury, West Coast, Tasman, Wellington, Hawke's Bay, Gisborne, Bay of Plenty and Northland. November and December were sunny months over much of the country and rainfall was once again less than 50% of normal in eastern areas of the country and between 50 and 80% of normal for the majority of the North Island. Soil moisture levels in eastern areas and in Waikato were between 30 and 50 mm lower than normal at the end of December. Double the normal rainfall for November fell in Tasman (mostly in two days) and for December in inland Canterbury and Banks Peninsula.

NIWA analyses of month-by-month records and preliminary end of year data show:

- The highest annual mean temperature recorded for the year was 16.5°C at Leigh.
- The highest recorded extreme temperature of the year occurred in South Canterbury being 34.8 °C recorded at Timaru Airport on 12 January and 19 March and at Waione on 22 January in very hot dry northwesterly conditions.
- The lowest air temperature for the year was -9.5 °C recorded at Mt. Cook on 20th August.
- The highest recorded wind gust for the year (as archived in the NIWA climate database) was 183 km/h at Mokohinau Island on 11 May in strong easterly conditions, and also 183 km/h at Hicks Bay on 18 June.
- The driest rainfall recording locations were Alexandra in Central Otago with 376mm of rain for the year, followed by Clyde with 378 mm, and then Middlemarch with 386 mm.
- Of the regularly reporting gauges, Cropp River in the Hokitika River catchment recorded the highest rainfall with 10,940 mm, followed by North Egmont 8878 mm for 2008.
- Wellington was by far the wettest main centre with 1662 mm, in contrast Christchurch and Dunedin were the driest of the five main centres with a mere 704 and 705 mm respectively. Auckland received 1226 mm and Hamilton 1220 mm.
- Blenheim was the sunniest centre in 2008, recording 2505 hours, followed by Nelson with 2472 hours, then Lake Tekapo with 2444 hours. Christchurch was the sunniest of the five main centres with 2230 sunshine hours, then Wellington 2205 hours. Auckland recorded 2108 hours, Hamilton 2057 hours and Dunedin 1912 hours.

Prevailing climate patterns – A rollercoaster. From La Niña to neutral and back again.

Overall, mean sea level pressures were near average over New Zealand, with more anticyclones ('highs') than average to the east of the country. This gave more frequent winds from the north and north east over the country. Warmer than normal sea temperatures prevailed around New Zealand from January to May, disappearing over winter, and becoming cooler during late spring before warming up again by early summer.

A moderate La Niña occurred in the equatorial Pacific from January to April, with neutral conditions becoming established over winter. However a weak-moderate La Niña had redeveloped by December.

Over New Zealand, monthly wind-flow patterns were highly variable throughout the year:

- January: very dry and settled conditions
- February: unsettled, with low pressures
- March: dry and settled (much like January)
- April: warm, moist northeasterlies affected the North Island
- May: wet and cold easterlies predominated
- June: strong southwesterlies prevailed
- July: unsettled, with low pressures
- August: wintry southerlies occurred frequently
- September: a switch to warmer northwesterlies
- October: tending more westerly
- November: back to warm, northwesterlies (similar to September)
- December: moist northeasterlies.

2008 temperatures: Above average especially in west of the North Island

The national average temperature in 2008 was 12.9 °C, 0.3 °C above the 1971–2000 normal. This was a result of several warm months and only one cold month. Temperatures were between 0.5 and 1.0°C above average in the west of the North Island and Nelson and up to 0.5 °C above average in most other regions. The warmest location was Leigh, with a mean temperature for the year of 16.5°C (0.3 °C above normal). For New Zealand as a whole, five were warmer than average months (January–March, June, and September); one month was cooler than average (May). All other months had mean temperatures close to the climatological average.

Hawera and Cromwell recorded their 2nd warmest years on record (based on averaging the mean daily temperature).

Wanganui and Cromwell recorded their highest average maximum temperature on record (based on averaging the maximum temperature recorded each day).

Near or record high annual average temperatures for 2008:

Location	Mean temperature (°C)	Departure (°C)	Year records began	Comments
Mean Temperature				
Kaikohe AWS	15.3	0.7	1973	3rd-highest
Paeroa AWS	15.2	0.6	1947	3rd-highest
Tauranga Aero AWS	15.4	0.8	1913	3rd-highest
Port Taharoa Aws	15.6	0.5	1973	3rd-highest
Te Kuiti EWS	14.2	0.6	1959	4th-highest
Paraparaumu Aero	13.7	0.7	1953	3rd-highest
Hawera AWS	13.1	0.6	1977	2nd-highest
Ohakune EWS	10.9	0.7	1962	3rd-highest
Wanganui, Spriggens Park	14.5	0.6	1937	4th-highest
Lake Rotoiti EWS	9.8	0.7	1965	3rd-highest
Nelson AWS	13.4	0.5	1943	4th-highest
Arthurs Pass	8.2	0.6	1978	4th-highest
Cromwell EWS	11.7	0.9	1949	2nd-highest
Mean Maximum Temperature				
Whangaparaoa AWS	19.0	1.0	1982	2nd-highest
Port Taharoa AWS	19.4	0.8	1973	3rd-highest
Te Kuiti EWS	19.7	0.9	1959	2nd-highest
New Plymouth AWS	18.3	0.9	1944	3rd-highest
Waipawa EWS	18.8	0.8	1945	2nd-highest
Wallaceville EWS	17.9	1.0	1939	3rd-highest
Hawera AWS	17.1	0.5	1977	3rd-highest
Ohakune Ews	16.0	1.0	1962	3rd-highest
Wanganui, Spriggens Park	18.7	0.9	1937	Highest
Lake Rotoiti AWS	15.7	1.2	1965	2nd-highest
Milford Sound AWS	15.7	1.1	1934	3rd-highest
Nelson AWS	18.2	0.9	1943	2nd-highest
Hanmer Forest EWS	17.9	1.3	1906	4th-highest
Arthurs Pass	12.7	0.7	1978	3rd-highest
Le Bons Bay AWS	14.8	0.3	1984	3rd-highest
Dunedin Aero AWS	16.4	0.6	1947	2nd-highest
Cromwell EWS	17.9	1.2	1949	Highest
Mean Minimum temperature				
Kaitaia EWS	12.2	0.4	1967	4th-highest

Kaikohe AWS	11.8	0.7	1973	2nd-highest
Tiri Tiri Lighthouse	13.7	1.0	1982	2nd-highest
Arc Kumeu EWS	10.2	0.7	1978	Highest
Whitianga Aero AWS	10.8	1.0	1962	2nd-highest
Paeroa AWS	10.4	0.9	1947	3rd-highest
Hawera AWS	9.1	0.7	1977	3rd-highest
Cape Campbell AWS	10.8	1.5	1953	4th-highest
Darfield EWS	6.9	0.7	1939	4th-highest
Gore AWS	5.6	0.2	1971	3rd-highest

New records for temperature extremes were set during the January 2008 heat wave, with extremely high day and night time temperatures especially in the west of the North Island.

Near or record high or low annual temperature extremes for 2008:

Location	Value (°C)	Date of occurrence	Year records began	Comments
Highest extreme maximums				
New Plymouth AWS	30.2	20 Jan	1944	2nd-highest
Castlepoint AWS	30.9	22 Jan	1972	3rd-highest
Palmerston North EWS	31.2	22 Jan	1918	4th-highest
Wallaceville EWS	30.9	21 Jan	1939	Highest
Stratford EWS	27.7	21 Jan	1960	Equal 4th-highest
Hawera AWS	26.4	21 Jan	1977	Equal 4th-highest
Highest extreme minimums				
Rotorua Aero AWS	19.8	22 Jan	1972	3rd-highest
Taupo AWS	20.2	22 Jan	1950	Highest
Hamilton AWS	22.2	22 Jan	1946	Highest
Turangi 2 EWS	20.0	22 Jan	1968	Highest
Paraparaumu Aero AWS	20.3	22 Jan	1972	2nd-highest
Wallaceville EWS	19.2	22 Jan	1972	Equal 4th-highest
Stratford EWS	20.3	22 Jan	1972	Highest
Waiouru AWS	18.5	22 Jan	1972	Highest
Wanganui, Spriggens Park	21.7	22 Jan	1972	2nd-highest
Takaka EWS	18.8	22 Jan	1978	4th-highest
Reefton EWS	17.8	8 Jan	1972	4th-highest
Nelson Aero	20.5	22 Jan	1943	2nd-highest
Lowest extreme maximums				
Castlepoint AWS	6.5	9 Aug	1972	Lowest
Hokitika Aero	6.0	15 Aug	1964	Equal 3rd-lowest
Arthurs Pass EWS	0.3	15 Aug	1973	Equal 2nd-lowest
Lowest extreme minimums				
New Plymouth AWS	-2.0	7 Jul	1944	4th-lowest
Martinborough EWS	-4.0	21 Aug	1986	Equal lowest
Waiouru AWS	-9.1	7 Aug	1962	2nd-lowest
Blenheim Aero AWS	-6.1	19 Aug	1932	2nd-lowest
Arthurs Pass EWS	-9.5	20 Aug	1973	Equal 2nd-lowest

A very sunny year, especially in Hawke's Bay, and the south of the South Island

It was a sunny year everywhere, with nowhere in New Zealand recording below normal sunshine totals. Sunshine hours were more than 115 percent of normal in central areas of the North Island,

Hawke's Bay, south Canterbury, coastal Southland and eastern Otago. Turangi, Dannevirke, Waipawa, and Invercargill experienced their sunniest years on record. All other regions recorded between 105 and 110 percent of normal except in those areas exposed to the north east: Northland, coastal Bay of Plenty, Buller, Nelson, and Marlborough. The sunniest centre in 2008 was Blenheim, recording 2505 hours, followed by Nelson with 2472 hours, then Lake Tekapo with 2444 hours.

Near or record high sunshine hours for the year 2008:

Location	2008 Sunshine (hours)	Percent of normal	Records began	Comments
Turangi 2 EWS	2186	113	1976	Highest
Dannevirke EWS	2080	116	1963	Highest
Waipawa EWS	2327	123	1945	Highest
Dunedin, Musselburgh EWS	1912	119	1947	3rd-highest
Cromwell EWS	2399	115	1979	2nd-highest
Balclutha	2096	128	1964	2nd-highest
Invercargill Airport	1907	119	1935	Highest

Rainfall:

**Above normal in the Far North, Marlborough and north Canterbury;
Normal throughout much of New Zealand;
Below normal in Gisborne, Hawke's Bay and Fiordland**

2008 annual rainfall was close to normal in many areas of New Zealand. Annual rainfall was more than 135 percent of normal at Cape Reinga, Wellington and in central Marlborough, and more than 120 percent of normal in the Far North, Marlborough, the Kaikoura Coast and north Canterbury. Above normal rainfall (at least 110 percent of normal) occurred in the remainder of north and central Canterbury, and other areas exposed to the north east in Northland and Nelson. Annual rainfall was less than 90 percent of normal in the south west of the South Island, and the east of the North Island, with parts of Fiordland, eastern Otago and southern Hawke's Bay recording less than 80 percent of normal.

Extremely high and low annual rainfall, for the year 2008:

Location	2008 rainfall (mm)	Percentage of normal	Year records began	Comments
Warkworth EWS	1750	119	1966	2nd-highest
Kelburn, Wellington	1662	135	1864	3rd-highest
Blenheim Aero AWS	994	134	1927	2nd-highest
Blenheim EWS	803	135	1930	Well above average
Waipawa EWS	611	73	1945	2nd-lowest
Lake Rotoiti EWS	1281	80	1933	2nd-lowest

Of the regularly reporting gauges monitored by NIWA, Cropp River in the Hokitika River catchment recorded the highest rainfall with 10,940 mm, followed by North Egmont with 8878 mm for 2008. Alexandra in Central Otago, was the driest of the sites where NIWA records rainfall, with 376 mm (102% of normal), followed by Clyde with 378 mm (91% of normal) and Middlemarch with 386 mm (76 percent of normal).

Of the five main centres, Wellington was by far the wettest main centre with 1662 mm (135 percent of normal) followed by Auckland with 1226 (104 percent of normal) and Hamilton (1220 mm: 113 percent of normal). In contrast, Christchurch and Dunedin were the driest of the five main centres with a mere 704 (112 percent of normal) and 705 mm (88 percent of normal) respectively. Near record values of annual 1-day rainfall extremes occurred at a few localities.

One day rainfall extremes for 2008:

Location	2008 1-day extreme rainfall (mm)	Date	Year records began	Comments
Kaikohe AWS	130	22 Feb	1956	4th-highest
Taupo AWS	101	15 Apr	1949	3rd-highest
Nelson Aero	105	14 Apr	1941	4th-highest
Hanmer Forest EWS	135	25 Aug	1905	3rd-highest

2008 climate in the five main centres

Auckland was the warmest of the five main centres. Wellington was by far the wettest. Christchurch and Dunedin were the driest. Christchurch was the sunniest.

Rainfall was the 3rd highest on record in Wellington, in records that go back to 1864. It was also wetter than normal in Hamilton and Christchurch, but drier than normal in Dunedin. It was especially sunny in Dunedin, which recorded the 3rd sunniest year (records go back to 1947). Sunshine totals were above average in most other main centres. Temperatures were above average in Hamilton, Wellington and Dunedin.

Location	2008 Mean Temp. (°C)	Dep. from normal (°C)		2008 rainfall (mm)	% of normal		2008 Sunshine (hours)	% of normal	
Auckland	15.4	+0.1	Normal	1226 ^a	102	Normal	2108	105	Above normal
Hamilton	14.0	+0.3	Above normal	1220	113	Above normal	2057	100	Near normal
Wellington	13.5	+0.7	Above normal	1662	135	3 rd highest	2201	107	Above normal
Christchurch	11.6	+0.0	Normal	704	114	Above normal	2234	106	Above normal
Dunedin	11.3	+0.3	Above normal	705	88	Below normal	1912	135	3 rd highest

^a Mangere ^b Christchurch Airport

Significant extremes

Drought

By 29th March severe soil moisture deficits (more than 130 mm) were present in parts of Auckland, Waikato, South Taranaki, Manawatu, Wairarapa and Marlborough. Significant soil moisture deficits (more than 110 mm) persisted throughout much of the west of the North Island, and from the Heretaunga Plains to Wairarapa, and in the east of the South Island. The combination of the hot and dry conditions meant that dairy farmers continued drying off dairy stock, with sheep farmers selling

stock early. The stock feed situation remained very low in the drought areas. April rainfall ended the severe and significant soil moisture deficits in much of the North Island, and May rains brought relief in other areas. This drought dramatically affected production from pastoral agriculture in the west of the North Islands, with economic costs estimated of at least \$1 billion, and MAF reporting an eleven percent fall in sheep numbers due to the drought.

Floods

There were numerous heavy rainfall events during 2008, about eighteen of which produced floods. The worst flooding events during 2008 were those of 14–16 April in the Central North Island, 29–30 July in Marlborough, and 26 August in Marlborough/North Canterbury. During the first event, heavy rainfall and flooding in Northland, Bay of Plenty, Central North Island and Nelson resulted in 8 deaths, one from a lightning strike, and seven in a flash flood. The deluge caused flooding of some homes in Rotorua and car crashes, with a two metre high wall of water sweeping down an Otonga hillside. The heavy rainfall in July resulted in a state of emergency being declared in Marlborough due to extensive surface flooding. The storm knocked out an important water pipeline in Nelson. Picton police and volunteers sandbagged the waterfront in an effort to save the town from flooding. The cost of the storm on the country was estimated to be more than \$10 million. Two people drowned while attempting to cross a swollen stream near Kawakawa in Northland. On 26 August slips closed SH1 from Weld Pass, near Seddon, to Cheviot, and roads around Kaikoura were sandbagged after surface flooding and the main water pipe into Cheviot was broken cutting water supply to the town. Mason River, a tributary of the Waiau River, burst its banks, putting the road under 4 m of water and isolating several houses. A raging Eyre River in north Canterbury claimed up to 100 dairy cows when a bridge approach was washed away and the settlement of Peketa, south of Kaikoura, was evacuated after the Kahutara River burst its banks.

Snow

There were seven moderate snowfall events over the winter season, with North Island ski areas reported good snowfall. Particularly notable were the snowfall on 15–17 August and the spring snowstorms. On the 15th – 17th of August a deep low brought heavy snow to the Southern Alps and the western and north western ranges. Arthur's Pass received about 1m of snow, closing the road for 3 days, while Mt Cook Village received about 60cm. This storm was particularly unique as snow fell to low levels (~100m) on the western and north western side of the Southern Alps. Areas not usually associated with heavy snow falls (e.g. Nelson Ranges and behind Buller) were also affected. On 27 September, snow fell to about 220 m in Otago and Southland. Cyclists on the Otago Central Rail Trail had to be picked up after being caught in a short but vicious storm which dumped 12 cm of snow at Wedderburn in just a couple of hours. SH 8 through the Lindis Pass was also closed briefly during the height of the snowstorm when a truck and trailer jack-knifed near the pass summit in the treacherous conditions. On 5 November an unseasonably cold blast hit the South Island, blanketing inland Southland, Fiordland and Central Otago with snow and hail. The brutal conditions forced Tour of Southland organisers to shorten two stages of the race, as competitors faced temperatures as low as 1 °C. Locals say it is the first time since the 1970s that they have seen this much snow in November.

Wind

Strong wind events were particularly marked in September and October, when rather boisterous conditions occurred at times. On 23 September high winds averaging 70 km/hr and gusting up to 100 km/hr disrupted flights at Dunedin Airport between noon and 5.30pm. Winds gusts reached 140 km/hr at Swampy Summit above Dunedin, 100 km/hr at Taiaroa Head, 135 km/hr on the Rock and Pillar Range, near Middlemarch. Some trees were damaged around the region. Nine flights were cancelled at Queenstown Airport because of poor visibility, strong winds and driving rain. High winds, with gusts of up to 157 km/hr, forced the closure of the Remarkables Ski Field at 2pm. On 7 October extreme winds caused significant disruption in the upper and lower North Island, forcing

road closures and damaging property and trees. Wind speeds of up to 130 km/hr were recorded in Wellington, and up to 160 km/hr in some of the surrounding hills. High winds even moved large shipping containers on Wellington's waterfront. Wellington Airport was closed for 6 hours, with flights resuming in the afternoon. Power was cut to about 4000 households and businesses in the Wairarapa and Wellington region as a result of trees falling over power-lines. A mini tornado ripped through the Cambridge area about 3.00am on 17 October. About 100 homes were affected, with 12 residents evacuated from one wing of a rest home. Trees and power-lines were brought down, and an 80-year-old oak tree was just plucked out of the ground.

Further detailed information about significant climate and weather events for 2008 is attached.

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Significant weather and climate events – 2008

High temperatures

2008 was notable for two periods of significant heat waves, one in January and the other in March. Many new records of extreme monthly maximum temperatures were established in January, March and November.

- **Heatwave conditions – 30 December – 22 January**

The highest temperature during January 2008 was 34.8 °C recorded at both Timaru Airport on the 12th and Waione on the 22nd.

From the 30th December to 22nd of January, apart from two days, heat wave conditions occurred in inland and eastern areas of the South Island. At least two locations record temperatures of 30°C or more over this period. Towards the end of this period numerous forest and scrub fires occurred. Wallaceville (Upper Hutt) recorded its highest January temperature on record of 30.9°C (records commenced in 1940) on the 21st and Palmerston North 31.8°C on the 22nd (records commenced in 1918).

Mean temperatures were at least 0.5 °C above average in the east of the North Island, and from 1 to 2°C above average over the remainder of New Zealand, and over 2°C in some parts of central and north Otago. The national average temperature of 18.3°C was 1.3°C above average.

- **18-21 March heatwave**

The highest temperature during March 2008 was 34.8 °C recorded at both Timaru Airport, and 35°C (rounded to the nearest degree) at Culverden and Woodbury on the 19th. These temperatures were the highest for 2008 to date. The 35°C was 1°C less than the highest ever New Zealand March temperature of 36°C recorded at Ashburton in 1956. From the 18th to the 21st heatwave conditions occurred in inland and eastern South Island areas, with temperatures of 30°C or more, and many locations recording their highest March temperatures on record.

The National average temperature of 16.5°C was 0.8°C above average. Mean temperatures were 1°C above average in the Waikato, western Bay of Plenty, Taranaki to Manawatu and parts of the west of the South Island, and at least 0.5°C above average in much of the remainder of the North Island, Marlborough, Westland, and parts of Canterbury and Otago.

- **Warm June**

The national average temperature of 8.9°C was 0.5°C above average. Mean temperatures were particularly high in inland South Canterbury and Otago, being 1.5 to 2 °C above average. Western and northern North Island areas were also warmer than normal for June (by between 0.5 to 1°C). The highest temperature during June 2008 was 23.1°C recorded at Waipara West on the 15th. This was only 0.9°C below the record South Island temperature for June of 24.0°C recorded at Kaikoura and Temuka on 2 June 1976. Westport Airport, Haast, Appleby, Blenheim Research Centre and Tekapo recorded their highest ever June maximum air temperatures.

- **11 and 19 July**

The highest temperature during July 2008 was 22.0°C recorded at Kaikoura on the 11th, the second equal highest July temperature on record (since 1964) at this location. The North Shore recorded 20.2°C on the 19th, which was the third highest July temperature at this location.

- **August**

The highest temperature during August 2008 was 19.9°C recorded at Haast on the 26th during a strong easterly air flow. The minimum temperature of 12.9°C at Haast on the 25th was also the highest for the country for August. Both of these temperatures were the highest August temperatures (maximum and minimum) at this location since records began in 1949.

- **November warm spells**

The highest temperature during November 2008 was 33.3°C recorded at Waione (Wairarapa) on the 24th (not a November record for this location). The minimum temperature of 19.2°C at Wanganui on the night of the 23rd/24th was the highest minimum for the country for November. Warm northwesterlies also brought record high temperatures in Otago and Canterbury on the 14th and 15th.

Extremes of daily maximum temperature in 2008 were recorded at:

Location	Maximum temperature (°C)	Records began	Comments
March			
Whatawhata	29.4	1952	3 rd highest
Ruakura	28.9	1907	4 th equal highest
Hamilton Airport	29.5	1970	Highest
Port Taharoa	27.5	1982	3 rd highest
Te Kuiti	29.8	1959	2 nd highest
Hanmer Forest	32.5	1906	Highest
Mt Cook	29.9	1930	Highest
Culverden	35.0	1928	Highest
Waipara West	34.4	2007	Highest
Winchmore	33.5	1950	Highest
Ashburton	33.9	1928	2 nd equal
Lake Tekapo	30.7	1927	Equal highest
Fairlie	32.0	1925	3 rd highest
Timaru Airport	34.8	1962	Highest
Tara Hills, Omarama	31.1	1950	2 nd highest
Wanaka Airport	29.6	1973	3 rd highest
Ranfurly	30.8	1928	Highest
Middlemarch	32.6	1925	Highest
Dunedin Airport	32.1	1963	2 nd highest
Manapouri, West Arm	25.9	1962	2 nd highest
Queenstown Airport	30.0	1969	Highest
Lumsden	29.7	1985	Highest
Alexandra	33.0	1929	Highest
Clyde	32.6	1947	Highest
Gore	29.0	1971	2 nd highest
June			
Westport Airport	19.0	1937	Highest
Haast	19.0	1950	Highest
Milford Sound	16.6	1935	3 rd highest
Appleby	20.7	1932	Highest
Blenheim Research Centre	21.3	1932	Highest
Blenheim Airport	20.5	1941	3 rd highest
Tekapo	18.5	1928	Highest
Westport Airport	19.0	1937	Highest
Haast	19.0	1950	Highest
Milford Sound	16.6	1935	3 rd highest
Appleby	20.7	1932	Highest
Blenheim Research Centre	21.3	1932	Highest
August			
Kumeu (Waitakere)	18.6	1978	2 nd equal highest
Te Puke	19.8	1973	3 rd equal highest
Pukekohe	18.7	1969	4 th highest
Turangi	17.1	1968	4 th equal highest
Wallaceville	18.2	1939	4 th highest
Takaka	19.3	1978	4 th highest
Lake Rotoiti	17.0	1965	Highest
Haast	19.9	1949	Highest
Milford Sound	17.8	1934	4 th highest
Appleby	18.6	1943	Highest
Cheviot	29.5	1982	Highest
September			
Whakatane Aero	22.0	1975	4 th highest
Gisborne	24.7	1905	4 th equal highest
Farewell Spit	19.5	1971	4 th highest

Lake Rotoiti	20.4	1965	3 rd highest
Kaikoura	25.5	1963	Highest
Culverden	25.0	1928	3 rd highest
Cheviot	22.8	1982	4 th highest
Fairlie	25.0	1925	4 th highest
Woodbury	26.0	1973	2 nd highest
Timaru	26.8	1885	Highest
Dunedin Aero	24.5	1947	2 nd highest
Dunedin, Musselburgh	25.6	1947	Highest
Manapouri Aero	19.2	1963	4 th highest
Lumsden	21.8	1982	2 nd highest
Cromwell	24.1	1949	3 rd highest
Gore	20.9	1971	3 rd highest
Tiwai Point	20.5	1970	3 rd highest
Balclutha	23.0	1964	2 nd highest
Nugget Point	23.9	1970	Highest
November			
Kaitaia Observatory	24.2	1985	4 th equal highest
Kaikohe	24.5	1973	3 rd highest
Dargaville	26.0	1943	2 nd equal highest
Whangarei Aero	25.8	1967	3 rd equal highest
Whangaparaoa	24.4	1982	Highest
Kumeu (Waitakere)	24.8	1978	4 th highest
Auckland Aero	25.6	1959	Highest
Pukekohe	25.8	1969	Highest
Whatawhata	25.1	1952	3 rd highest
Hamilton	26.6	1946	2 nd highest
Port Taharoa	25.7	1973	2 nd highest
Te Kuiti	27.6	1959	Highest
Takapau Plains	26.8	1962	2 nd highest
Dannevirke	28.0	1951	Highest
Martinborough	27.4	1986	Highest
Ngawi	27.9	1972	4 th highest
Paraparaumu Aero	25.4	1953	3 rd highest
Palmerston North	28.6	1918	Highest
Levin	26.9	1895	3 rd highest
Wellington Aero	25.3	1962	3 rd highest
Wallaceville	25.2	1939	4 th highest
Stratford	23.9	1960	4 th highest
Ohakune	24.9	1962	3 rd highest
Waiouru	23.3	1962	3 rd highest
Wanganui	26.0	1937	4 th highest
Arthurs Pass	23.0	1978	3 rd highest
Culverden	31.0	1928	4 th equal highest
Cheviot	30.2	1982	2 nd highest
Waipara West	30.5	1973	3 rd highest
Darfield	31.4	1939	Highest
Le Bons Bay	25.8	1984	3 rd highest
Fairlie	31.0	1925	4 th highest
Oamaru Airport	30.9	1908	2 nd highest
Wanaka Aero	27.5	1955	4 th equal highest
Dunedin Aero	31.0	1947	Highest
Lumsden	27.1	1982	Highest
Cromwell	30.6	1949	Highest
Balclutha	27.6	1964	3 rd highest
December			
Martinborough	29.9	1986	3 rd highest
Ohakune	28.8	1962	Highest
Waiouru	25.0	1962	4 th highest
Wanganui	25.8	1987	4 th equal highest
Pelorus Sd, Crail Bay	26.0	1982	4 th equal highest
Culverden	33.0	1928	3 rd highest
Cheviot	32.0	1982	Highest
Gore	27.9	1971	3 rd highest
Nugget Point	27.5	1970	2 nd highest

Unusually high mean monthly temperatures were recorded at:

Location	Mean temperature (°C)	Departure from normal (°C)	Records began	Comments
January				
Pukekohe	20.5	+1.9	1969	2 nd highest
Whatawhata	20.1	+2.0	1952	3 rd highest
Ruakura	20.3	+2.0	1921	3 rd highest
Hamilton Airport	20.4	+2.2	1970	2 nd highest
Nelson Airport	19.5	+1.8	1941	2 nd highest
Arthurs Pass	15.2	+2.4	1980	2 nd highest
Tekapo	17.5	+2.3	1927	2 nd highest
Fairlie	17.5	+1.8	1925	2 nd highest
Tara Hills	18.5	+2.3	1950	Highest
Wanaka	19.3	+2.0	1927	Highest
Alexandra	19.8	+2.4	1928	3 rd highest
Clyde	19.0	+1.9	1984	2 nd highest
February				
Waiouru MWD	15	26	1951	3 rd lowest
March				
Pukekohe	24.1	+1.8	1971	Highest
Whatawhata	24.1	+1.8	1952	4 th highest
Hamilton Airport	24.9	+1.9	1970	Highest
Te Kuiti	25.3	+2.5	1959	2 nd highest
New Plymouth Airport	22.8	+1.9	1944	2 nd highest
Manapouri, West Arm	18.3	+2.1	1962	3 rd equal highest
Queenstown Airport	20.9	+2.2	1969	3 rd highest
June				
Kaikohe	12.9	+1.4	1973	3 rd highest
Milford Sound	7.3	+1.6	1935	4 th highest
Puysegur Point	10.2	+1.8	1978	2 nd highest
Arthurs Pass	4.1	+1.5	1978	4 th highest
Mt Cook	4.9	+1.8	1930	4 th highest
Wanaka Airport	5.8	+2.0	1973	3 rd equal highest
Queenstown Airport	5.6	+2.0	1969	2 nd highest
Alexandra	5.7	+2.3	1927	4 th highest
Clyde	5.3	+2.1	1947	3 rd highest
Invercargill Airport	7.2	+1.6	1948	2 nd highest

Low temperatures and severe frost

Cold spells occurred in May, briefly in July, August and November. However, none of these were abnormal.

- **May – cold and frosty**

The national average temperature of 9.6°C was 1.1°C below average. This made it almost 4°C lower than mean air temperatures in April. Mean temperatures were particularly low in inland South Island areas being 1.5 to 2°C below average, and also in central North Island areas. Mean temperatures were 1°C below average in Auckland, the southern half of the North Island and many South Island areas.

It was much frostier than normal in May, with ground frosts of 5°C or more occurring on 24 days in some inland areas.

- **8-9 July**

There were freezing temperatures across the country on the 9th, with negative numbers recorded from Auckland (-1°C) to Queenstown (-4°C). The unusual sight of frost in Auckland was seen for two days in a row on the 8th and 9th.

- **August**

The coldest temperature during August was recorded at Arthurs Pass on the 20th, where the minimum temperature was -9.5°C. At lower elevations, Alexandra recorded -8.0°C on the 10th (the middle of three very cold days throughout the country – it got down to -7.0°C at Alexandra on the following day as well). Hanmer Forest also recorded -7.3°C on the 20th. There were several record or near-record low daily maximum temperatures during August, with Clyde only reaching 2.7°C (the maximum temperature for the day) on the 12th and Balclutha only creeping up to 3.0°C on the 16th (both of these were record low daily maxima for August).

- **6-8 November**

Unseasonal frosts struck the Ashburton area overnight on 6 November, with grass minimum temperatures of -6.0 °C, affecting newly planted spring vegetables. Hundreds of helicopters descended on vineyards and orchards in Central Otago and Canterbury overnight on 8 November after unseasonably cold temperatures were forecast. In some areas temperatures fell to -4 °C putting entire crops at risk.

Extremes of minimum temperature in 2008 were recorded at:

Location	Minimum temperature (°C)	Date of occurrence	Records began	Comments
July				
Waiouru	-9.1	7 th	1962	Lowest
Motu (west of Gisborne)	-7.1	7 th	1991	Lowest
Culverden	-6.0	15 th	1983	2 nd lowest
August				
Kaitaia Observatory	1.5	10th	1985	Lowest
Kerikeri	-0.3	10th	1981	2 nd lowest
Whangarei Aero	0.8	10th	1967	2 nd lowest
Warkworth	-0.3	9th	1966	2 nd lowest
Kumeu (Waitakere)	-2.0	9th	1978	3rd lowest
Auckland, Owairaka	-0.7	9th	1949	3rd lowest
Te Puke	-1.8	10th	1973	2 nd lowest
Turangi	-5.7	19th	1968	2 nd lowest
New Plymouth	-0.9	9th	1944	3 rd equal lowest
Martinborough	-4.0	20th	1986	Lowest
Hicks Bay	1.8	9th	1969	4 th equal lowest
Wairoa, North Clyde	-1.0	10th	1964	4 th equal lowest
Stratford	-2.5	19th	1960	3 rd lowest
Hawera	-1.9	19th	1977	4 th equal lowest
Lake Rotoiti	-8.6	19th	1965	3 rd lowest
Hokitika Aero	-2.8	18th	1963	2 nd lowest
Haast	-2.5	8th	1949	2 nd lowest
Appleby	-4.2	9th	1943	2 nd lowest
Arthurs Pass	-9.5	19th	1973	2 nd lowest
Woodbury	-6.0	9th	1973	2 nd equal lowest
Dunedin Aero	-5.0	9th	1947	Lowest
Queenstown Aero	-5.6	9th	1871	3 rd lowest
Tiwai Point	-2.4	9th	1970	3 rd equal lowest
Balclutha, Telford	-5.7	9th	1964	3 rd lowest
September				
Takapau Plains	-2.9	28th	1962	3 rd lowest
Dannevirke	-3.1	28th	1951	4 th lowest
Martinborough	-3.0	6th	1986	2 nd lowest
Ngawi	3.0	6th	1972	Lowest
Paraparaumu Aero	-1.9	6th	1953	4 th lowest
Wallaceville	-4.0	6th	1939	3 rd lowest
Pelorus Sd, Crail Bay	1.0	11th	1982	4 th lowest
Dunedin Aero	-3.8	6th	1947	2 nd lowest
Queenstown Aero	-3.9	5th	1871	3 rd lowest
Lumsden	-4.1	5th	1982	2 nd lowest
Balclutha	-4.2	4th	1964	Lowest

November				
Kaitaia Observatory	5.9	1st	1985	4 th equal lowest
Warkworth	4.4	21st	1966	Lowest
Taumarunui	-0.3	8th	1947	4 th equal lowest
Turangi	-2.1	8th	1968	2 nd lowest
Dannevirke	-1.5	8th	1951	2 nd lowest
Martinborough	0.3	8th	1986	4 th lowest
Waipawa	-0.2	8th	1945	4 th equal lowest
Greymouth Aero	2.2	6th	1947	3 rd lowest
Haast	0.1	6th	1949	Lowest
Milford Sound	0.4	6th	1934	2 nd lowest
Puysegur Point	1.3	6th	1978	Lowest
Motueka	1.4	7th	1956	4 th equal lowest
Pelorus Sd	5.0	6th	1982	4 th equal lowest
Winchmore	-1.9	6th	1928	4 th lowest
Christchurch Aero	-2.6	6th	1863	Lowest
Lincoln	-2.0	6th	1881	3 rd lowest
Le Bons Bay	0.5	6th	1984	Lowest
Woodbury	-2.0	6th	1973	2 nd equal lowest
Wanaka Aero	-2.0	6th	1955	3 rd lowest
Dunedin Aero	-1.7	8th	1947	Lowest
Dunedin, Musselburgh	1.1	8th	1947	2 nd equal lowest
Queenstown Aero	-2.1	8th	1871	Lowest
Lumsden	-2.9	8th	1982	Lowest
Tiwai Point	0.7	5th	1970	2 nd lowest
Balclutha	-0.4	8th	1964	2 nd lowest
Nugget Point	0.5	6th	1970	3 rd lowest
December				
Warkworth	6.4	7th	1966	2 nd lowest
Hanmer Forest	-1.7	6th	1906	3 rd equal lowest
Cheviot	0.0	22nd	1982	2 nd lowest
Balclutha	0.8	13th	1964	2 nd lowest

Unusually low mean monthly temperatures were recorded at various times during the year at:

Location	Mean temperature	Departure from average (°C)	Records Began	Comments
May				
Taupo	7.8	-1.6	1962	Lowest
Castlepoint	11.0	-1.8	1985	3 rd lowest
Waiouru	5.5	-1.5	1962	3 rd lowest
Wanganui Airport	10.8	-1.4	1988	2 nd lowest
Tekapo	3.8	-2.2	1927	4 th lowest
Queenstown Airport	4.6	-2.0	1969	3 rd lowest
Lumsden	5.4	-1.9	1982	2 nd lowest
August				
Dannevirke	7.1	-1.2	1951	4 th lowest
Castlepoint	9.2	-1.1	1972	2 nd lowest
Arthurs Pass	2.2	-2.3	1973	3 rd lowest
Cheviot	5.7	-1.4	1982	2 nd lowest
Le Bons Bay	6.8	-0.6	1984	3 rd lowest
Dunedin Aero	5.7	-0.8	1947	2 nd lowest
Lumsden	4.6	-1.0	1982	4 th lowest
Tiwai Point	6.3	-0.9	1970	4 th lowest
Balclutha, Telford	4.1	-2.5	1964	Lowest
November				
Kaitaia Observatory	5.9	1st	1985	4 th equal lowest
Warkworth	4.4	21st	1966	Lowest
Taumarunui	-0.3	8th	1947	4 th equal lowest
Turangi	-2.1	8th	1968	2 nd lowest
Dannevirke	-1.5	8th	1951	2 nd lowest
Martinborough	0.3	8th	1986	4 th lowest
Waipawa	-0.2	8th	1945	4 th equal lowest
Greymouth Aero	2.2	6th	1947	3 rd lowest
Haast	0.1	6th	1949	Lowest
Milford Sound	0.4	6th	1934	2 nd lowest

Puysegur Point	1.3	6th	1978	Lowest
Motueka	1.4	7th	1956	4 th equal lowest
Pelorus Sd	5.0	6th	1982	4 th equal lowest
Winchmore	-1.9	6th	1928	4 th lowest
Christchurch Aero	-2.6	6th	1863	Lowest
Lincoln	-2.0	6th	1881	3 rd lowest
Le Bons Bay	0.5	6th	1984	Lowest
Woodbury	-2.0	6th	1973	2 nd equal lowest
Wanaka Aero	-2.0	6th	1955	3 rd lowest
Dunedin Aero	-1.7	8th	1947	Lowest
Dunedin, Musselburgh	1.1	8th	1947	2 nd equal lowest
Queenstown Aero	-2.1	8th	1871	Lowest
Lumsden	-2.9	8th	1982	Lowest
Tiwai Point	0.7	5th	1970	2 nd lowest
Balclutha	-0.4	8th	1964	2 nd lowest
Nugget Point	0.5	6th	1970	3 rd lowest

Floods and high rainfall

There were numerous heavy rainfall events during 2008, about eighteen of which produced floods or damaged property and caused loss of life. Most of the rainfall events that produced flooding are listed below. The worst flooding events during 2008 were those of 14-16 April in the Central North Island, causing 8 deaths, 29-30 July in Marlborough, and 26 August in Marlborough/North Canterbury causing states of emergency to be declared.

- **7-8 January**

Heavy rain localised to the Kapiti District produced widespread flooding in Horowhenua. Over 200 mm of rain fell at Muhunua, with 320 mm at Oriwa, 140 mm at Waikanae and 120 mm at Levin in 30 hours. The floods closed State Highway 1 south of Levin, and closed several other roads. It also closed Waikanae camping ground and caused evacuations of some houses.

- **22 January**

The remnants of ex-tropical cyclone Funa crossed the South Island producing 160 mm at Haparapara (Bay of Plenty), 217 mm at Little Devil (Tasman District) and 227 mm at Waiho (Westland). Makarora received 123 mm of rain which brought down a rockslide closing State Highway 6. However this brought welcome rain to Bendigo, Tarras and the Upper Clutha with 50 mm of rain.

- **11-12 February**

A low crossed the South Island on 11/12th triggering thunderstorms with heavy rain, hail and flash flooding in the Canterbury foothills and north Canterbury. These same thunderstorms produced 64 mm at Amberley and 77 mm at Rangiora. A deluge of 23 mm in one hour occurred in Lower Hutt.

- **22-23 February**

A subtropical low brought between 200 and 240 mm to the hills between Kaeo and Kaikohe, which caused minor flooding in Kaeo.

- **30 March**

Heavy drought-breaking rain occurred in Taranaki with 100 mm at Stratford.

- **4 April**

A localised deluge of 25 mm between 8.00 and 9.15 pm brought flash flooding in Greymouth.

- **14-16 April**

A low with a frontal system moved from the Tasman Sea over Nelson and the North Island and produced heavy rainfall and flooding in Northland, Bay of Plenty, Central North Island and Nelson. It caused 8 deaths, one from a lightning strike, and seven in a flash flood. On the 14th in the Nelson area, 132 mm fell in 24

hours in Takaka, and 99 mm at Appleby, which caused isolated slips and brief floods. On the 15th in Northland, 55 mm occurred in an hour in the Hokianga, with 94 mm in 3 hours. A man and his horse were struck by lightning and killed near Dargaville. The Opononi area school was closed and evacuated. A lightning strike near Kaitaia caused the Doubtless Bay area to be without power for 3 hours. Further south, 1-day totals of 126 mm at Matamata, 108 mm at Rotorua Airport and 101 mm at Taupo caused flooding and slips. The deluge caused flooding of some homes in Rotorua and car crashes, with a two metre high wall of water sweeping down an Otonga hillside. The deluge in Tongariro National Park caused a flash flood on the Mangatepopo stream 25 km west of Turangi drowning seven people. Further heavy rainfall in the eastern Bay of Plenty and near East Cape produced 120 to 130 mm in the hill country with minor slips on SH2. The highest 1-day rainfall was 132 mm recorded at Takaka on the 14th.

- **29-30 April**

A trough passing over New Zealand produced further heavy rainfall, with flood damage around coastal in Northland, Taranaki and Kapiti. A 40 mm rainfall occurred at both Paraparaumu and New Plymouth between 10 pm on the 29th and 3 am on the 30th, with 95 mm at North Egmont. A number of houses were severely damaged near Okato when the Stony River burst its banks, with widespread damage to farms to the south. Floodwaters swept through 10 shops and several houses on the Kapiti Coast. In Wellington 94 mm on 30th April occurred with fire fighters being called out 40 times to weather-related incidents, with most incidents involving involving surface flooding.

- **4 May**

In Tauranga 83 mm occurred in strong north easterlies. There was also 84 mm in Khyber Pass Road, Auckland which caused localised flooding in houses.

- **29 June**

40 to 50 mm of rain in Wellington and the Hutt Valley up to 5 pm produced some local flooding of roads, with slips closing Paekakariki Hill road.

- **9 July**

The area around Mt Taranaki received 100mm of rain in the 24 hours to 6am, and 60mm also fell in Milford Sound. Lower Hutt received 26mm of rain between 4am and 6am.

- **11 July**

32mm of rain fell within a few hours at Nelson airport on the morning of the 11th and even heavier rains may have come down in the surrounding hills. A large slip on Rocks Road, SH6 was cleared enough to allow cars through by the afternoon. The heavy rain and flooding in Nelson caused sewage to overflow into the harbour.

- **26 July**

A river burst its banks near the township of Panguru, on the northern side of Hokianga Harbour, and up to 35 people had been evacuated and roads throughout Northland were closed by flooding. The Kauaeranga River in the Coromandel also broke its banks and flooded the highway.

- **29-30 July**

More than 160mm of rain fell in parts of the Coromandel overnight resulting in parts of Hikuai and Pauanui on State Highway 25 being under more than a metre of water. The Karangahake Gorge SH2 between Paeroa and Waihi was flooded with water about 30cm deep, SH25 south of Whitianga was flooded with water 1m deep and was impassable, and Kaihikatea Road Dairy Flat was flooded. Slips and downed trees caused closures of several other roads. One North Shore home was completely destroyed in a slip, with another 14 homes at risk. Tauranga and the Western Bay of Plenty received approximately 45mm of rain from 9pm on the 29th to 5pm on the 30th. Whakatane received around 22mm of rain and Rotorua received approximately 14mm of rain in that time. A number of roads to the west of Gisborne were closed by surface flooding.

A state of emergency was declared by Marlborough District Council on the 30th due to extensive surface flooding. The storm knocked out an important water pipeline in Nelson. Picton police and volunteers sandbagged the waterfront in an effort to save the town from flooding. Severe flooding in the small South Island town of Sefton meant that 12 people had to be evacuated and spent the night in the local school hall.

The cost of the storm on the country is estimated to be more than \$10 million. One person drowned while attempting to cross a swollen stream near Kawakawa in Northland. Another person was missing, presumed dead.

- **Mid-August**

By mid-August heavy rain and wind in north Canterbury and Marlborough caused massive landslides, and flattened hundreds of hectares of pine plantations. The cold wet weather came in the middle of lambing and calving, and just after the clean up of the July storms. Sports events, particularly junior matches, were cancelled all over the country, as councils tried to maintain their grounds. Record groundwater levels in Levin caused the town's four sewage containment ponds to overflow, creating one massive pond.

- **26 August**

The 126 mm of rain which fell in the 24 hours to 9am on the 26th at Kaikoura (the second highest 1-day August rainfall for this location since 1898) resulted in several landslides, surface flooding, disruption of the clean water supply, road and rail closures, damage to bridges, evacuations of residents (again) and the death of many livestock including newly-born lambs.

Specific rain-related events were:

Date	Event
2–3 August	Wellington City had more than 20 slips, causing road closures and property damage.
5 August	<ul style="list-style-type: none"> ○ Huntly College was closed when the Waikato River flooded the school grounds. ○ School pupils living on East Cape were prevented from travelling to school in Gisborne when storm damage blocked SH35 at Kemps Hill, north of Ruatoria. A temporary road was opened on 13 August.
7 August	The road to Eastbourne was closed by a major slip. Many people had to leave their vehicles on the Lower Hutt side of the slip and walk home.
13 August	Slips near Te Awamutu reduced SH34 at Aria, and SH37 at Waitomo, to one lane.
14 August	SH1 at Waikanae closed by heavy rain.
15 August	<ul style="list-style-type: none"> ○ The northbound lane of SH1 south of Otaki was blocked by a fallen tree. ○ Both Lower Hutt and Upper Hutt were affected by surface flooding.
19 August	Slip blocked the Lyttelton Tunnel for an hour. Alternative routes had been closed by snow and ice.
24 August	The Clevedon–Kawakawa Bay was closed by a slip.
25 August	<ul style="list-style-type: none"> ○ Roads and paddocks around Cust under water. ○ The main trunk line was closed by a slip at Billy Goat Bay near Kaikoura.
26 August	<ul style="list-style-type: none"> ○ Campers at Picton Camping Ground evacuated to spend the night in Queen Charlotte College. Queen Charlotte Drive was closed by numerous slips, and there was surface flooding south of Picton. ○ Slips closed SH1 from Weld Pass, near Seddon, to Cheviot, and roads around Kaikoura were sandbagged after surface flooding. ○ The main water pipe into Cheviot was broken cutting water supply to the town. ○ Tank water needed for Amberley and other areas of Hurunui District after main supply affected. ○ Mason River, a tributary of the Waiau River, burst its banks, putting the road under 4 m of water and isolating several houses. ○ A raging Eyre River in north Canterbury claimed up to 100 dairy cows when a bridge approach was washed away. ○ The settlement of Peketa, south of Kaikoura, was evacuated after the Kahutara River burst its banks. ○ Hurunui College, Cheviot Area and Greta Valley schools were closed. ○ Several slips blocked the inland road from Waiau to Kaikoura which was passable only through a gated access road. ○ South of Cheviot, a tree partially blocked SH1 at Domett. ○ A road bridge in Blythes Valley, south of Cheviot, was swept away. ○ Rural roads and farmland flooded around Sefton. ○ SH7 from the Hanmer Springs turnoff to Hanmer Springs closed, but open for 10 minutes every hour from 3pm to 6pm. ○ A major slip closed the Petone over-bridge north of Wellington for several hours. ○ Southbound lane of SH2 closed by slip on Featherston side of Rimutaka summit. ○ Flooding and slips in Albany forced the evacuation of several homes.
27 August	In Wellington a slip caused a ruptured gas main.
28 August	Wairarapa sewerage and storm-water systems affected by severe flooding, and forcing evacuation of homes in Masterton. Many roads in the area closed by flooding. High stock losses expected in new born lambs.
30 August	Heavy rain caused one of the four legs of a power pylon tower carrying electricity between the North

and South islands to slump with Transpower monitoring its stability.

- **23 September**

On 23 September, the Milford Road was closed by a slip, 200 m long, 40 m wide, and about 2 m deep, which isolated the town. Two women had to run for their lives to evade the cascading debris, and a group of people trapped by the debris spent a cold night in their van. Only helicopter access was available until the 28th when a single lane was open to traffic.

- **27 September**

Heavy rain affected Otago with Queenstown receiving 25 mm, and Wanaka 20 mm between 8 am and noon. A landslide north of Lake Hawea on SH 6 reduced the main arterial link to the West Coast to one lane for most of Saturday afternoon.

- **7 October**

Heavy rain in Taranaki caused flash floods in mountain streams, resulting in the death of a tramper who was swept away attempting to cross the swollen Kaupokonui Stream on Mt Taranaki, hampered by a heavy backpack. Parts of the South Island also experienced heavy rain.

- **4 November**

The Manawatu Gorge road was closed to all traffic for several hours by a large slip blocking both lanes.

- **24 November**

Heavy rain from a northerly subtropical flow caused floods in Nelson and the West Coast, with eastern areas experiencing warm, humid conditions. Some vineyards in the Nelson region turned into lakes as up to 300 mm of rain fell in just 24 hours. The Matai River was close to bursting its banks and flooding parts of the city. The ranges between Takaka and Collingwood received 328 mm of rain in 24 hours. In Takaka, rain was torrential all day, with sandbags needed when river water spilled into the street. Schools closed early in Golden Bay, stock were rescued from low-lying areas, and the army ferried stranded motorists to safety. Several roads were closed by flooding and slips, including SH60 over Takaka Hill isolating Golden Bay, SH6 between Whataroa and Haast, and the highway between Nelson and Havelock. Three Tasman District Council hydrologists were trapped in the Upper Lee Valley when the heavy rain made ford crossings impassable, and the Upper Lee River flooded over a bridge. The rain gauge at Cropp River, in the Southern Alps inland from Hokitika, recorded 1000 mm in three days.

Near record high extreme 1-day rainfall totals were recorded at:

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year Records Began	Comments
April				
Gisborne	86	6 th	1937	
Takaka	132	14 th		
Riwaka	93	14 th		
Nelson Airport	105	14 th		
Appleby	99	14 th		
Matamata	126	15 th		
Toenipi	95	15 th		
Whakatane Airport	92	15 th		
Rotorua Airport	108	15 th		
Taupo Airport	101	15 th		
Turangi	77	15 th		
Kelburn, Wellington	94	30 th		
July				
Paeroa	166	26 th	1914	Highest
Cheviot	147	30 th	1983	Highest
Kaikoura	144	30 th	1898	Highest
Ngawi (Cape Palliser)	128	30 th	1930	Highest
Okuti (Banks Peninsula)	125	28 th	1916	Highest
Hanmer Forest	121	30 th	1906	2 nd highest
August				

New Plymouth	64	24th	1944	3 rd highest
Hanmer Forest	135	25th	1905	Highest
Kaikoura	126	25th	1898	2 nd highest
Woodbury	61	25th	1973	3 rd highest
September				
Pelorus Sound	166	11th	1982	Highest
Mt Cook	236	23rd	1928	3 rd highest
October				
Warkworth	49	24th	1967	3 rd highest
Woodbury	100	7th	1973	Highest
November				
Kaitaia Observatory	45	24th	1985	2 nd highest
Takaka	128	23rd	1976	2 nd highest
Reefton	92	24th	1960	Highest
Okarito	154	22nd	1981	Highest
December				
Auckland Aero	58	23rd	1959	3rd-highest
Pukekohe	64	23rd	1944	3rd-highest
Reefton	84	19th	1960	3rd-highest
Blenheim Aero	56	15th	1927	2nd-highest

Near or record monthly rainfall

Locations that experienced near or record high monthly rainfall at various times during the year were:

Location	Rainfall (mm)	Percentage of normal for the month	Year Records began	Comments
February				
Kerikeri EWS	300	322	1982	3 rd highest
Kerikeri Airport	297	263	1979	3 rd highest
Kaikohe AWS	254	276	1973	2 nd highest
Winchmore EWS	119	225	1947	3 rd highest
Rangiora EWS	147	333	1965	Highest
Christchurch Airport	122	296	1944	3 rd highest
April				
Cape Reinga	232	201	1920	3 rd highest
Warkworth	227	202	1972	Highest
Matamata	198	198	1966	4 th highest
Whakatane Airport	256	275	1975	Highest
Rotorua Airport	296	256	1964	Highest
Taupo Airport	156	211	1976	Highest
July				
Stratford	442	208	1938	3 rd highest
Paeroa	416	275	1914	Highest
Wallaceville (Upper Hutt)	326	232	1924	Highest
Hanmer Forest	284	248	1905	3 rd highest
Auckland (Owairaka)	249	170	1949	2 nd highest
Pukekohe	248	186	1963	3 rd highest
Auckland Airport	215	157	1962	3 rd highest
Paraparaumu Airport	210	207	1945	4 th highest
Winchmore	182	281	1947	Highest
Nelson Airport	166	198	1941	2 nd highest
Christchurch Airport	165	230	1944	3 rd highest
Blenheim	153	210	1927	3 rd equal highest
Darfield	148	196	1920	4 th highest
Culverden	132	216	1915	2 nd highest
Dunedin Airport	123	249	1963	2 nd highest
Timaru Airport	116	262	1957	3 rd highest
July				
Stratford	442	208	1938	3 rd highest
Paeroa	416	275	1914	Highest
Wallaceville (Upper Hutt)	326	232	1924	Highest
Hanmer Forest	284	248	1905	3 rd highest
Auckland (Owairaka)	249	170	1949	2 nd highest

Pukekohe	248	186	1963	3 rd highest
Auckland Airport	215	157	1962	3 rd highest
Paraparaumu Airport	210	207	1945	4 th highest
Winchmore	182	281	1947	Highest
Nelson Airport	166	198	1941	2 nd highest
Christchurch Airport	165	230	1944	3 rd highest
Blenheim	153	210	1927	3 rd equal highest
Darfield	148	196	1920	4 th highest
Culverden	132	216	1915	2 nd highest
Dunedin Airport	123	249	1963	2 nd highest
Timaru Airport	116	262	1957	3 rd highest
August				
Whatawhata (Waikato)	284	173	1952	2 nd highest
Turangi	228	149	1968	3 rd highest
New Plymouth	277	215	1944	Highest
Paraparaumu	159	176	1945	4 th highest
Palmerston North	165	219	1928	4 th highest
Ohakune	203	180	1961	3 rd highest
Waiouru	181	192	1950	2 nd highest
Blenheim Aero	162	239	1927	3 rd highest
Hanmer Forest	284	231	1905	3 rd highest
Kaikoura	240	340	1898	4 th highest
November				
Kaitaia Observatory	143	142	1985	4 th highest
Takaka	443	249	1976	2 nd highest
Okarito	547	214	1981	Highest
December				
Takaka	277	205	1976	3rd-highest
Blenheim Aero	127	227	1927	3rd-highest
Tara Hills	143	264	1949	4th-highest

Low soil moisture levels and record low monthly rainfall

During the first part of the year from January to March drought and extremely low rainfall occurred in the west of the North Island, Marlborough and Wairarapa. Dry conditions were affecting all eastern areas by the end of summer.

- **January**

By the end of January severe soil moisture deficits (more than 130 mm) had developed from Auckland to the King Country, South Taranaki, northern Manawatu, Hawke's Bay to Wairarapa, Wellington, and persisted in the South Island from Marlborough to central Canterbury. The remainder of the North Island, except Northland and Horowhenua were recording significant soil moisture deficit, as well as other northern and eastern South Island areas from Nelson through to inland Southland. The combination of the hot and dry conditions meant that dairy farmers in some areas started drying off dairy stock, with sheep farmers selling stock early. Water restrictions were imposed in Wanganui, South Taranaki and parts of the Waikato, with drought committees being formed in Southland and Canterbury.

- **February**

By the last day of February severe soil moisture deficits (more than 130 mm) had persisted in the Hauraki plains, parts of the Waikato, southern Taranaki and northern Manawatu, in the east from Napier to the Wairarapa, central Marlborough, and in parts of Otago and Southland. Much of the remainder of the North Island, except Northland, were recording significant soil moisture deficit, as were Nelson, and much of Otago and Southland.

- **March**

By 29th March severe soil moisture deficits (more than 130 mm) were present in parts of Auckland, Waikato, South Taranaki, Manawatu, Wairarapa and Marlborough. Significant soil moisture deficits (more than 110 mm) persisted throughout much of the west of the North Island, and from the Heretaunga Plains to Wairarapa, and in the east of the South Island. The combination of the hot and dry conditions meant that

dairy farmers continued drying off dairy stock, with sheep farmers selling stock early. The stock feed situation remained very low in the drought areas.

- **April**

April rainfall ended the severe and significant soil moisture deficits in much of the North Island. Significant soil moisture deficits (more than 110 mm) persisted in Canterbury, north and central Otago.

- **November**

Significant and severe soil moisture deficits had developed throughout eastern areas from Gisborne to Otago by the end of November.

- **December**

Soil moisture levels were low in eastern North Island areas, Waikato and in much of Southland, being between 10 and 50 mm lower than normal for this time of the year as at the end of December.

Many locations measured unusually low rainfall at various times during the year. These were:

Location	Rainfall (mm)	Percentage of normal	Year records began	Comments
January				
Paeroa	8	10	1916	Very low
Matamata	3	3	1966	Lowest
Pukekohe	13	14	1982	2 nd lowest
Ruakura	4	4	1906	Lowest
Hamilton Airport	7	8	1990	Lowest
East Taratahi	13	27	1926	2 nd lowest
Waiouru	11	12	1966	2 nd lowest
Wanganui	15	25	1908	2 nd lowest
Kaikoura	7	17	1949	2 nd lowest
Le Bons Bay	6	9	1948	2 nd lowest
February				
Waiouru MWD	15	26	1951	3 rd lowest
May				
Paraparaumu Airport	12	12	1945	Lowest
Wallaceville	36	28	1924	4 th lowest
Westport Airport	68	34	1944	3 rd lowest
Hokitika Airport	89	37	1866	2 nd lowest
Franz Josef	72	17	1928	2 nd lowest
Riwaka, Motueka	3	3	1943	Lowest
Nelson Airport	8	11	1941	Lowest
Appleby	6	7	1932	Lowest
Blenheim	4	7	1927	Lowest
Blenheim Airport	8	13	1941	Lowest
Awatere Valley	8	11	2001	Very low
Tekapo	7	14	1925	Lowest
Timaru Airport	6	13	1957	3 rd lowest
August				
Okarito	66	27	1981	Lowest
Arthurs Pass	75	23	1906	2 nd lowest
September				
Kerikeri	70	39	1981	4 th lowest
Dargaville	39	38	1943	4 th lowest
Warkworth	49	36	1966	2 nd lowest
Whangaparaoa	31	34	1946	3 rd lowest
Whitianga Aero	80	48	1961	4 th lowest
Whakatane Aero	44	49	1952	3 rd equal lowest
Auckland Aero	39	40	1959	2 nd lowest
Gisborne	13	15	1905	4 th lowest
Wairoa, North Clyde	24	22	1964	3 rd lowest
Hawera	48	52	1977	4 th lowest
October				
Okarito	172	47	1981	3 rd lowest

Lumsden	42	51	1982	2nd lowest
November				
Matamata	38	42	1951	3 rd lowest
Rotorua Aero	42	41	1963	2 nd lowest
Taupo	34	42	1949	4 th equal lowest
Ruakura	37	39	1905	4 th lowest
East Taratahi	17	24	1926	3 rd lowest
Gisborne	12	20	1905	3 rd lowest
Wairoa	11	14	1964	Lowest
Hawera	40	36	1977	2 nd lowest
Waiouru	38	48	1950	3 rd lowest
Wanganui	44	59	1987	4 th lowest
Hanmer Forest	20	21	1905	4 th lowest
Kaikoura	11	18	1898	4 th lowest
Culverden	8	16	1921	2 nd lowest
Darfield	13	24	1919	3 rd lowest
Lincoln	11	24	1881	2 nd lowest
Oamaru Airport	15	33	1898	3 rd lowest
Ranfurly	12	34	1943	4 th lowest

Snowfall

Less winter snowfall events compared to normal occurred, but those of 15-19 were very widespread and to low levels. More notable were the four spring snowstorms, the last occurring in November.

- **5 May**

Snow fell on the Napier-Taupo highway overnight.

- **23-24 May**

Snowfall occurred across the alpine regions of the South Island with many ski fields reporting their first significant snow fall for the season. Reports of between 10-40 cm were not uncommon, with areas in central Otago receiving the most (e.g. Coronet Peak, The Remarkables, Cardrona and Treble Cone). Snow fall data collected at one of our new NIWA snow monitoring sites supported these reports with up to 48cm recorded at Albert Burn - a site situated at about 1280m and about 30km north of Treble Cone and about 20km east of Mt Aspiring.

- **7 June**

Snow fell from Southland to the Kaikoura coast with up to 20 cm lying in the Maniototo, snow flurries in Dunedin, and snow flakes in Christchurch closing the airport for a few hours. Porters Pass road closed.

- **24 June**

Snow fell to 200 metres in Southland with snow and sleety conditions to low levels in the east of the South Island.

- **28 June**

Snow closed roads around Ruapehu including the Desert Road, after heavy snow fell on the Central Plateau.

- **4-6 August**

Early August saw a brief but cold system bring snow to low elevations and close most alpine roads in the east and south of the South Island and the central parts of the North Island. Several ski fields recorded new snowfall totals exceeding 1m over a 48 hour period. Only a few days later on the 9th, Christchurch was blanketed in 2–5cm of snow. This system moved north and closed the Rimutaka Hill road and Desert road on the 10th.

- **15-19 August**

On the 15th – 17th of August a deep low brought heavy snow to the Southern Alps and the western and north western ranges. Arthur's Pass received about 1m of snow, closing the road for 3 days, while Mt Cook Village received about 60cm. This storm was particularly unique as snow fell to low levels (~100m) on the western

and north western side of the Southern Alps. Areas not usually associated with heavy snow falls (e.g. Nelson Ranges and behind Buller) were also affected. At one stage during this event, Transit New Zealand reported eight highways closed due to snow. About 600 homes and businesses in Tasman District were without power after a severe dump of snow brought down power lines on 15 August. The RNZAF, taking part in exercises in Marlborough, used helicopters to drop off feed to snow-bound stock in Awatere Valley.

This event was rapidly followed (18th – 19th) by a colder southerly flow which brought snow to Christchurch and closed roads on Banks Peninsula. The Rimutaka road out of Wellington was also blocked by snow and the Desert road was closed for several days. During this event over 1m of snow was recorded at Ruapehu village, with 15–20cm down at the Château at Ruapehu. Snow was also recorded to very low levels in the North Island, with snow observed in Featherston and down to sea level at Paekakariki. Bad weather delayed the rescue of six climbers trapped in Mt Cook National Park. A break in the weather on 18 August allowed a helicopter to pick them up from their small tent near the Mueller Hut, where they had been trapped for 36 hours. The large volumes of snow also caused extreme avalanche conditions in many parts of the Southern Alps with the Mountain Safety Council warning back country user to avoid the mountains especially around Arthur’s Pass the Craigieburn Range and Mt Cook. These conditions caused the closure of the Milford Road for several days and also saw an avalanche cross SH73 near Arthur’s Pass (for the first in almost 20 years). Three large avalanches were also reported in the Tararua Range, north of Wellington – these are the first reports of avalanches in the Tararua Range since 1929.

Mrt Ruapehu’s Whakapapa ski field recorded 3.5 m of snow pack, the largest snow base on record (1992).

Date	Effect
8 August	Snow and strong south-westerlies hit Dunedin, stranding about 100 vehicles on SH1 at Waitati for up to an hour.
9 August	<ul style="list-style-type: none"> ○ SH2 closed along Rimutaka Hill Road. ○ Roads in Christchurch hill suburbs closed until cleared by graders. Chains required on Summit Road.
10 August	<ul style="list-style-type: none"> ○ SH2 over Rimutaka Ranges closed by snow and sleet ○ Several Christchurch and Banks Peninsula roads closed
14 August	<ul style="list-style-type: none"> ○ SH47 between The Chateau and National Park only accessible by 4-wheel drive. ○ Lewis Pass, Arthurs Pass and Milford Road affected by snow. ○ Heavy snow storm at 4pm brought traffic to a stop in Queenstown.
15 August	<ul style="list-style-type: none"> ○ Travellers stranded in Murchison. ○ SH6 closed from Otupiko to Murchison closed ○ SH63 closed from Wairau Valley to Howard ○ SH65 closed from Shenandoah to Maruia ○ SH6 closed near Inangahua ○ SH73 closed from Springfield to Otira. Snow about 1 m deep in Arthurs Pass village, and a massive snow slide just south of the village completely covering SH73. ○ SH6 closed from Haast to Makarora ○ SH8 closed from Omarama to Tarras ○ SH49 closed from Fiordland National Park to Milford Sound
16 August	<ul style="list-style-type: none"> ○ Roads re-opened with caution in Nelson-Tasman after heaviest snow in decades. Single lane opened on Hope Saddle, with traffic sent through once an hour in convoy. ○ Flights in and out of Queenstown Airport cancelled or delayed. ○ Severe snow warning issued for South Island’s West Coast, for the first time in 10 years. ○ Lewis Pass, Arthurs Pass closed, plus SH6 from Franz Josef to Fox Glacier, sections of the highway around Milford Sound, Haast Pass, Hope Saddle, and St Arnaud
17 August	<ul style="list-style-type: none"> ○ SH1 between Rangipo and Waiouru closed for third night in a row. ○ Heli-skier rescued from avalanche near Glenorchy. He was buried under 2 m of snow.
19 August	<ul style="list-style-type: none"> ○ Snow reported in Paekakariki, and Featherston. ○ Overnight snow in Christchurch closed hill roads, and schools, with many Banks Peninsula roads also closed. ○ SH87 closed between Outram and Middlemarch ○ SH94 closed between Te Anau and Milford Sound ○ SH73 between Arthurs Pass and Otira only open to vehicles with chains, and traffic delays of an hour experienced. ○ SH1 closed on Desert Road. ○ Streets of Dannevirke coated in snow. ○ Ice and snow made roads slippery and driving conditions difficult in the Shannon area. ○ Heavy frosts reported in Wellington and Hutt Valley. One plane leaving Wellington was delayed because of problems de-icing the wings.

- **27 September**

Snow fell to about 220 m in Otago and Southland. Arrowtown and Naseby had 10 cm, St Bathans had 13 cm, and Jollys Pass, about 20km north of Lumsden on State Highway 6, had 15 cm. Cyclists on the Otago Central Rail Trail had to be picked up after being caught in a short but vicious storm which dumped 12 cm of snow at Wedderburn in just a couple of hours. SH 8 through the Lindis Pass was also closed briefly during the height of the snowstorm when a truck and trailer jack-knifed near the pass summit in the treacherous conditions. Strong winds with gale-force gusts in the early hours of 27 September gave way to heavy rain and then snow. In Athol, 9 cm of snow fell in the three hours to 10.30 am, and homes and businesses were without power for most of the day after two power poles outside the town boundary snapped. Electricity was restored at about 4.30 pm.

- **7 October**

Queenstown woke to late-season snow, and Transit NZ advised chains must be carried by anyone heading to Milford Sound. The fall started about 7 am and was enough to close Queenstown Airport with flights cancelled. The Remarkables ski field received about 20 cm of snow, and Cardrona about 5 cm.

- **26 October**

Snow fell as low as the Canterbury Plains overnight on 26 October, with 30 cm recorded at Mt Hutt ski field.

- **5 November**

An unseasonably cold blast hit the South Island on 5 November, blanketing inland Southland, Fiordland and Central Otago with snow and hail. The brutal conditions forced Tour of Southland organisers to shorten two stages of the race, as competitors faced temperatures as low as 1°C. Locals say it is the first time since the 1970s that they have seen this much snow in November. The West Coast was also affected with snow in Reefton, sleet at Ngahere and Hokitika, and unseasonal snow on the alpine passes. State Highway 94, from Lower Hollyford to Milford Sound, re-opened on 5 November after being closed overnight by snow.

Sunshine extremes

Some locations experienced extremes of sunshine hours at various times during the year, with seven months being particularly sunny in various locations. Only two months were very cloudy.

Monthly sunshine extremes for 2008 were:

Location	Sunshine (hours)	Percentage of normal	Year Records began	Comments
January				
Mt Cook	246	136	1935	2 nd highest
Tekapo	308	120	1928	Highest
Musselburgh, Dunedin	279	157	1935	Highest
Invercargill Airport	287	160	1935	Highest
February				
New Plymouth	256	115	1933	3 rd highest
April				
Tekapo	224	141	1928	3 rd highest
May				
Ruakura	178	136	1936	2 nd highest
Palmerston North	155	148	1928	2 nd highest
July				
Mt Cook, The Hermitage	41	55	1930	Lowest
Stratford	79	66	1963	2 nd lowest
Martinborough	75	73	1968	3 rd lowest
Kaitaia	85	57	1951	2 nd lowest
Motueka	89	60	1965	Lowest
July				

Mt Cook, The Hermitage	41	55	1930	Lowest
Stratford	79	66	1963	2 nd lowest
Martinborough	75	73	1968	3 rd lowest
Kaitaia	85	57	1951	2 nd lowest
Motueka	89	60	1965	Lowest
September				
Kaitaia	198	118	1985	2nd highest
Turangi	164	120	1976	3rd highest
Dannevirke	182	141	1963	3rd highest
Waipawa	207	141	1945	3rd highest
October				
Lake Tekapo	261	132	1928	3rd highest
Dunedin, Musselburgh	215	143	1947	Highest
Cromwell	261	127	1979	3rd highest
Invercargill Aero	202	130	1932	4th highest
Balclutha	226	144	1964	Highest
November				
Te Kuiti	214	133	1962	2nd highest
Taumarunui	225	137	1947	3rd highest
Turangi	219	117	1976	4th highest
Martinborough	230	119	1986	4th highest
Waipawa	246	136	1945	4th highest
Christchurch Aero	268	125	1930	3rd highest
Balclutha	222	130	1964	2nd highest

Severe or damaging hail and electrical storms

- **3 May**

A thunderstorm produced an intense lightning storm which ‘fried’ electrical systems in Lincoln, Canterbury.

- **24-28 June**

Hail and thunder occurred from Wanganui to Auckland on the 24th, and blustery southwesterlies on the 25th and 26th produced thunder, lightning and hail from Taranaki to Auckland. Lightning cut power to 4000 Waitara residents. A flash lightning storm brought down trees, power lines and lifted roofs in south east Auckland on the morning of the 27th. On the 28th, hail storms lashed Auckland.

- **2 & 5 July**

More than 7500 lightning strikes were recorded on the South Island's West Coast with 1100 in one hour alone on the 2nd, and power was knocked out for a short time. Around another 2200 strikes were recorded on the 5th, mostly along the west coast of both islands.

- **18 - 20 July**

Northern and western parts of the North Island experienced a total of 25,000 lightning strikes from midnight on the 18th to 6pm on the 20th.

- **14 August**

More than 1500 lightning strikes were recorded over the Auckland Waikato region, with most strikes over the Tasman Sea. Wellington also experienced a spectacular electrical storm, complete with booming thunder and torrential rain.

- **7 November**

Wellington city experienced a dramatic hail storm on the afternoon of 7 November. Hail remained in drifts for several hours.

- **17 November**

Hail-stones as big as golf balls struck Ashburton late afternoon on 17 November. Crops, glass-houses, skylights and cars suffered serious damage. Many of the stones were larger than 25 mm. Streets and businesses were flooded.

Tornadoes, high winds, and rough seas

During 22 – 30 July damaging gales occurred in many areas. Strong wind events were particularly marked in September and October, when rather boisterous conditions occurred at times.

- **22 January**

Wind speeds of 158 km/hr occurred at Castlepoint, and 143 km/hr at Mt Kaukau (Wellington) from the westerly quarter. The former was the highest gust for the month. These were all caused by ex-tropical cyclone Funa, and high wind gusts brought down power lines in Canterbury, and also in the lower North Island to 16,000 homes.

- **16 February**

Strong southwesterlies with gusts of 126 km/h were recorded on Banks Peninsula.

- **7 March**

A tornado funnel was sighted in Auckland.

- **1 April**

A tornado hit Ngakawau, near Westport at 5.10 pm tearing the roof off a workshop, blowing in windows and snapping a power pole. Wind speeds were estimated at 180-200 km/h.

- **30 April**

Another tornado occurred at 3.30 am across forests and farmlands between Te Haroto and Tarawera about 60 km northwest of Napier. It uprooted some trees and snapped power poles, cutting power to 100 homes for a few hours.

- **11 May**

The highest wind gust for the month was 183 km/h at Mokohinau Island on the 11th, in strong easterly conditions.

- **18 June**

The highest wind gust for the month was 183 km/h at Hicks Bay on the 18th.

- **7 June**

High winds affected flights into Queenstown and brought trees down in Central Otago. Westerlies and north westerlies gusted up to 110 km/h at Gore, 120 km/h at Kelburn and 170 km/h at Castlepoint.

- **22 June**

A mini-tornado damaged properties in Papamoa near Tauranga in blustery northerlies, damaging the roofs of three homes in one street.

- **24 June**

Strong cold southwesterlies gusted to 124 km/h at Awakino (Taranaki) and 100 km/h in Auckland. Very blustery westerlies and southwesterlies produced gusts up to 147 km/h at Awakino on the 26th, 132 km/h at Manukau Heads and 133 km/h at Cape Reinga on the 27th.

- **29 June**

Strong southerlies brought winds gusting as high as 148 km/h in the Wellington region on the 29th, causing 7 metre swells in Cook Strait, cancelling interisland ferries and regional flights in and out of Wellington Airport.

- **6 July**

Gale force winds in Cook Strait led to the cancellation of interisland ferry services on the 6th and strong winds in Christchurch also blew down several power poles.

- **8 July**

Wind gusts along the east coasts of the North and South Islands reached 120km/hr overnight on the 8th.

- **22-23 July**

High winds on the 22nd damaged property in the Taranaki region. There were also reports of a small tornado in coastal Taranaki. Along Auckland's west coast gusts reached 105km/hr. Wind gusts of between 100km/hr and 110km/hr buffeted both the Hauraki Gulf and Manukau Heads on the 23rd. Further south, at Golden Valley west of Tauranga, gusts of up to 100km/hr were recorded.

- **26 July**

Northland experienced wind gusts of up to 174km/hr brought down trees and power lines as a storm made landfall. Thousands of homes were without power in the region. Power was also cut to 53,000 homes in Rodney, Waitakere and the North Shore. There were another 7000 without power in Auckland in Howick, Otara, Clevedon, Mangere and parts of Waiheke Island. Gusts in Auckland Harbour reached 125km/hr. Hundreds of trees were brought down and several roofs were blown off by high winds in Te Aroha, in the eastern Waikato.

- **30 July**

Winds of around 80km/hr hit Tauranga between 4am and 5am on the 30th and a tornado struck Tauranga and Mt Maunganui around 9am lifting roof tiles and smashing windows.

- **August**

The highest gust for the month was 128 km/hr at Castlepoint on the 22nd, with a gust of 124 km/hr also recorded at Puysegur Point on the same day. Neither of these gusts were August records for these locations though (the August record high wind gusts are 164.9 and 183.6 km/hr, respectively). Other notable events in the month were:

Date	Effect
4 August	Property in Kimberley Road, Levin, was severely damaged when a mini-tornado struck in the early hours.
12 August	A double garage in Mt Maunganui lost its roof, and tiles were sheared off houses in several nearby streets.
19 August	A 'twister' east of Opotiki brought down power lines, and electrocuted 16 in-calf cows. Two barns were brought down, hundreds of metres of fencing destroyed, and trees scattered. Nearby properties were also damaged.

- **11 September**

A tornado was reported in the Bell Block area of New Plymouth about midnight on 11 September. Damage occurred to power lines and roofs.

- **23 September**

High winds caused problems in Otago. Crosswinds, averaging 70 km/hr and gusting up to 100 km/hr, disrupted flights at Dunedin Airport between noon and 5.30pm. Winds gusts reached 140 km/hr at Swampy Summit above Dunedin, 100 km/hr at Taiaroa Head, 135 km/hr on the Rock and Pillar Range, near Middlemarch. Some trees were damaged around the region. Nine flights were cancelled at Queenstown Airport because of poor visibility, strong winds and driving rain. High winds, with gusts of up to 157 km/hr, forced the closure of the Remarkables Ski Field at 2pm. A tree fell on a moving car in on Three Mile Hill Road, Dunedin, about 10 am. The three occupants were travelling towards Dunedin when a section of a pine tree about 15 m long, probably weakened by strong overnight winds, split in two places, broke about 5 m from the ground, and fell on to the front passenger side of the car as it travelled up the hill, pushing in the car's bonnet, and smashing the windscreen, before bouncing off the car and being wedged underneath.

- **27 September**

Strong southerly winds on the 27th caused problems on the Access Road to the Remarkables Ski Field, forcing its closure.

- **7 October**

Extreme winds caused significant disruption in the upper and lower North Island, forcing road closures and damaging property and trees. Wind speeds of up to 130 kph were recorded in Wellington, and up to 160 kph in some of the surrounding hills. SH2, at the Rimutaka Hill Road, was closed until mid-afternoon. High winds even moved large shipping containers on Wellington's waterfront. Wellington Airport was closed for 6 hours, with flights resuming in the afternoon. Power was cut to about 4000 households and businesses in the Wairarapa and Wellington region as a result of trees falling over power-lines. The power cuts began at about 8 am, with power restored to most properties in the afternoon.

- **17 October**

A mini tornado ripped through the Cambridge area about 3.00am. About 100 homes were affected, with 12 residents evacuated from one wing of a rest home. Trees and power-lines were brought down, and an 80-year-old oak tree was just plucked out of the ground. One resident lost an aviary – and the birds. Six houses were declared uninhabitable.

Near record high extreme wind gusts were recorded at:

Location	Extreme wind gust speed (km/hr)	Date of extreme gust	Year Records began	Comments
July				
Cape Reinga	174	26 th	1974	4 th highest
Awakino (Taranaki)	147	26 th	2005	Highest
Baring Head (Wellington)	143	29 th	1991	Highest
Brothers Island (Cook Strait)	143	29 th	1997	Highest
Mokohinau Island (Northland)	124	27 th	1994	2 nd highest
Nelson	119	30 th	1972	Highest
Warkworth	115	26 th	1973	4 th equal highest
Paeroa	115	26 th	1993	Highest
Awakino (Taranaki)	115	31 st	2005	3 rd highest
Dargaville	108	26 th	1998	2 nd highest
Auckland Airport	107	27 th	1971	4 th highest
Lincoln	100	5 th	1999	Highest
August				
Kaitaia	95	15 th	1985	4 th equal highest
Kaikohe	80	2 nd	1986	4 th equal highest
Levin	85	16 th	1971	4 th highest
September				
Castlepoint	169	27 th	1972	Highest
Puysegur Point	152	1 st	1986	2 nd equal highest
Tara Hills	100	27 th	1985	3 rd highest
Dunedin Aero	117	21 st	1972	2 nd highest
Lauder	119	23 rd	1981	4 th highest
December				
Pukekohe	61	17 th	1986	3 rd equal highest
Westport Aero	83	31 st	1973	4 th equal highest

Fog

- **16 May**

Fog on May 16th closed Auckland and Hamilton Airports, and occurred in central Otago.

- **25 August**

Fog disrupted flights in and out of Auckland Airport in the morning. It then rolled in to Wellington Airport about mid-day, causing the cancellation of at least 20 domestic flights, and the disruption of international flights.

- **10 September**

Thick fog forced the cancellation of a number of flights in and out of Christchurch in the morning. The fog lifted about 1pm.

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