

New Zealand national climate summary 2010: Settled and warm

Annual mean sea level pressures were above average over the New Zealand region in 2010. The increased prevalence of anticyclones ('highs') near New Zealand produced a relatively settled climate for the year overall, with average or above average annual temperatures in all regions, normal or above normal sunshine hours in most districts, and drought at either end of the year.

The large-scale climate setting changed from a moderate El Niño at the start of the year, to a La Niña by July. The La Niña climate pattern intensified to moderate-to-strong by September, and prevailed through the end of 2010. The Southern Annular Mode (SAM), a climate pattern affecting the westerly wind strength and location over and to the south of the country, was strongly positive overall in 2010. This contributed to the prevalence of anticyclones experienced near New Zealand.

Mean annual temperatures were above average (between 0.5°C and 1.2°C above the long-term average) in the northeast of the North Island, and in Nelson, Marlborough, parts of Canterbury, Fiordland and parts of Westland, the southern Lakes District and central Otago. Mean annual temperatures were near average elsewhere (within 0.5°C of the long-term average). The national average temperature for 2010 based on a 7-station series was 13.1 °C, 0.5 °C above the 1971–2000 annual average. 2010 was the 5th warmest year since 1900, based on this 7-station series. The four warmer years were 1971 (+0.6 °C), 1998 (+0.9 °C), 1999 (+0.8 °C), and 2005 (+0.6 °C).

In broad terms, six months of the year were wetter than normal and six were drier than normal (with clear geographical exceptions). The net result was that annual rainfall totals for 2010 as a whole were in the near normal range (80 to 119 percent of normal) across most of the country. The exceptions were eastern parts of the North Island (specifically Coromandel, parts of the Bay of Plenty, Gisborne, Hawke's Bay, and Wairarapa), Blenheim, parts of North Canterbury and southwest Fiordland, which experienced above normal annual rainfall (with totals more than 120 percent of normal). In contrast, areas of Northland, Auckland and Waikato, Otago, the Lakes District and parts of the West Coast and Buller recorded below normal annual rainfall totals (between 50 and 85 percent of normal).

It was a sunny year in the west, both in the North Island, and in the west and south of the South Island. It was the sunniest year on record for Te Kuiti, since records began there in 1962. Whakatane was the sunniest location in 2010, recording 2561 hours, followed by Nelson (2474 hours) and Blenheim (2415 hours).

Notable climate features of 2010 (in various parts of the country) included two droughts, several heat waves, and three significant rainfall events. Drought was declared in January in Northland, and in Auckland, Waikato, Bay of Plenty, South Taranaki, South Canterbury and Otago in April. The drought broke in May, only to be declared again in December in Northland, Waikato and Ruapehu. Heat waves affected the West Coast at the end of January, Central Otago on 8–9 March, and numerous locations on 28–30 November and 12–15 December. Exceptionally heavy rain occurred on 31 January in the northeast North Island; widespread heavy rain and flooding occurred in the southwest South Island from 25–27 April, resulting in flood-threshold levels of Lake Wakatipu; and a sustained period of heavy rain during 24–30 May in the eastern South Island caused numerous floods, slips, road and property damage. On December 28, heavy rain, flooding and high winds caused havoc for many areas of the country.

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Section 1: Prevailing climate patterns – Switch from El Niño to La Niña, positive SAM

Annual mean sea level pressures were above average over the New Zealand region in 2010. The dominance of anticyclones ('highs') near New Zealand compared to normal produced a relatively settled climate for the year overall, with average or above average annual temperatures in all regions, a relatively sunny year in many districts, and drought in place at the start of the year in Northland, and declared at the end of the year in Northland, Waikato and Ruapehu.

Tropical climate patterns to the north of the country affected New Zealand climate in 2010. The start of 2010 was dominated by a moderate El Niño event in the equatorial Pacific. During autumn, the tropical Pacific climate returned to neutral (neither El Niño nor La Niña), but by July, a La Niña had developed (Figure 1). The La Niña strengthened to moderate to strong intensity by September, and prevailed through the end of 2010.

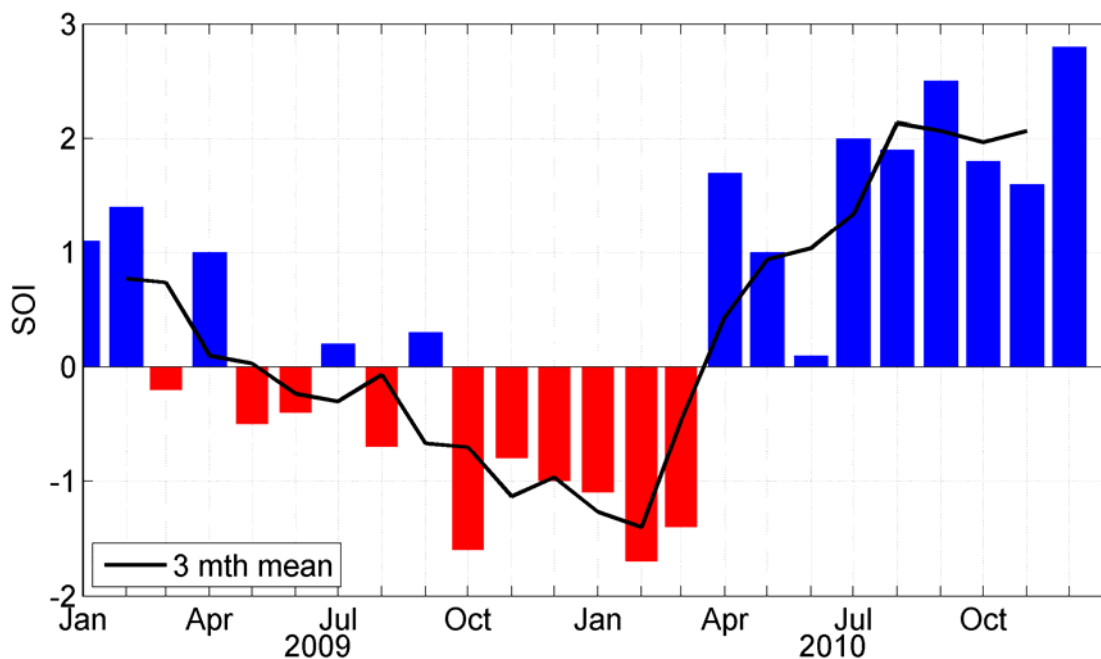


Figure 1: The monthly mean Southern Oscillation Index (SOI) for 2009-2010. The SOI is an index of the El Niño-Southern Oscillation (ENSO) cycle and measures the strength of the tropical Pacific trade winds. Values of the SOI above +1 indicate La Niña conditions, and those below -1 indicate El Niño.

At the same time, to the south of New Zealand, another climate pattern was strongly influencing our climate in 2010. The Southern Annular Mode (SAM) is one of the most prominent features of southern hemisphere climate on monthly and seasonal time scales. The SAM controls where and how strongly the middle-latitude westerly winds blow, and where the tracks of storms and anticyclones lie across the southern middle latitudes. In the positive phase of the SAM, anticyclones ('highs') tend to predominate at New Zealand latitudes, and the westerly winds are stronger than normal over the southern oceans. The SAM has been strongly positive during much of 2010 (Figure 2).

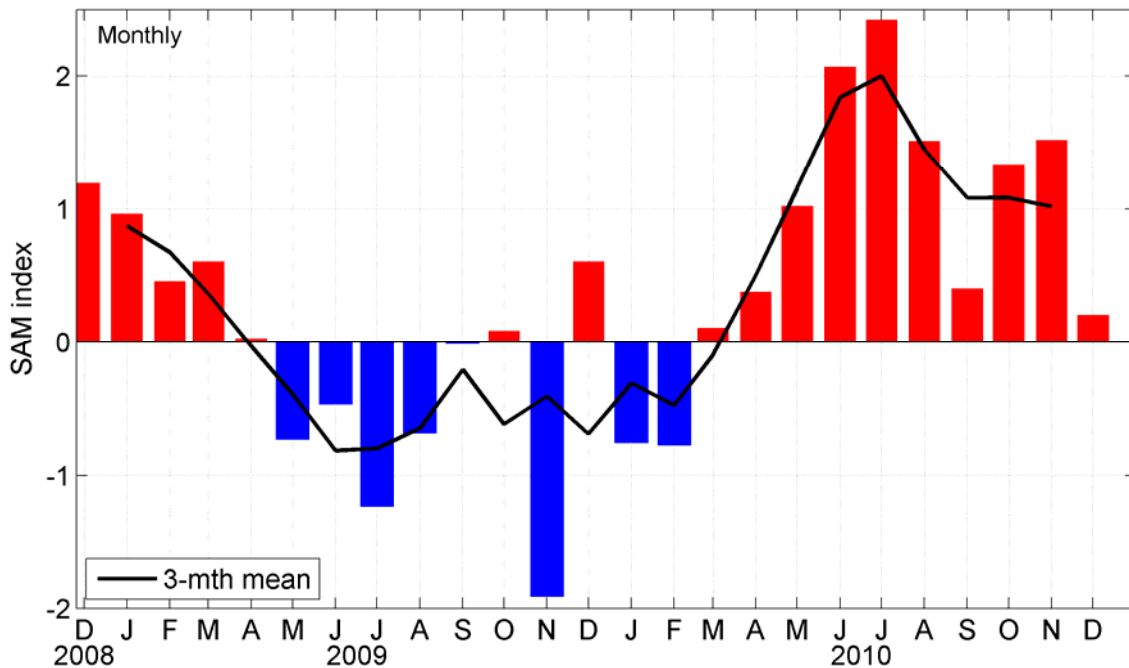


Figure 2: The monthly mean Southern Annular Mode (SAM) index for 2009-2010. The index is related to the strength of the westerly winds over the southern Oceans. Positive values indicate stronger than normal southern ocean westerlies and higher than normal pressures at New Zealand latitudes, while negative values indicate weakened southern ocean westerlies and lower than normal pressures over New Zealand.

Section 2: The year in review

The monthly sequence of New Zealand climate (with clear geographical exceptions) was as follows:

- January: Wet and cloudy for most areas, except Northland where drought continued.
- February: Hot and dry for most of the country. Soil moisture deficits continued.
- March: Extremely dry in northeast North Island, Canterbury and Otago. Dry soils widespread.
- April: Drought declared in more regions.
- May: Extremely wet in eastern areas. Drought broken.
- June: Very wet except for the West Coast. Cool over the South Island.
- July: Mid-winter magic – sunny and settled.
- August: Cloudy, warm and extremely wet.
- September: Wild westerlies – wet and windy.
- October: Spectacularly sunny and very dry in most areas.
- November: Highs and dryness continued to dominate. Record warm in South Island.
- December: Drought declared in Northland, Waikato, Ruapehu. Wet in second half of month.

January: Wet and cloudy for most areas. Severe soil moisture deficit continued in Northland.

It was an unsettled month, with lower pressures than normal over the country and wet and extremely cloudy conditions over most regions. The notable exception was Northland: severe soil moisture deficits present at the end of 2009 continued and drought was declared there in January. In contrast, a heavy rainfall event on the 31st affected eastern and central parts of the North Island, as well as Waikato and Coromandel. A moist, easterly air stream brought heavy rain and embedded thunderstorms to these areas, causing flooding, slips, and road closures. Particularly hard hit were Gisborne and Hawke's Bay. A heat wave affected the West Coast of the South Island over the period 29 January–1 February.

February: Hot and dry for most of the country. Severe soil moisture deficits developed further.

February was a very settled month, with more frequent anticyclones over New Zealand than usual. It was extremely dry and warm. Severe soil moisture deficits continued in Northland during February, and also developed in parts of Auckland, Marlborough, Canterbury and Otago.

March: Extremely dry in northeast North Island, Canterbury, Otago. Dry soils widespread.

Frequent anticyclones continued in March, dominating over the Tasman Sea and resulting in dry southwesterly winds over the country. It was an extremely dry March for the north and east of the North Island, South Canterbury and Otago. Severe soil moisture deficits continued in Northland and Auckland, South Canterbury and Otago. Significant soil moisture deficits also developed during March in the Waikato, Bay of Plenty, Coromandel, Taupo and parts of Gisborne and Hawke's Bay. A heat wave affected Central Otago during 8–9 March.

April: Drought declared in more regions.

April was another month where anticyclones prevailed in the New Zealand region. It was a very dry month for much of the North Island and upper South Island. Drought was declared for Auckland, Waikato, Bay of Plenty, South Taranaki, South Canterbury and Otago in April, joining Northland which was declared a drought area in January. Even after some helpful rainfall at the end of the month, significant soil moisture deficits remained in many areas of the North Island (except for Taranaki, Gisborne, and the Kapiti Coast), as well as in Marlborough and Canterbury. In contrast, enhanced northwest winds affected the South Island, producing extraordinarily high rainfall in the southwest of the South Island.

May: Extremely wet in eastern areas. Drought broken.

May was a stormy month overall, with enhanced northeasterly winds. It was extremely wet in eastern regions, with several flood events. It was the wettest May on record at Whangaparaoa, Kumeu, Whitianga, Blenheim, Timaru, Oamaru, and Dunedin, and phenomenally, May rainfall totals were more than four times the May normal at Dunedin (Airport) and Oamaru. The drought had broken, although soils remained drier than normal in Waikato and Manawatu.

June: Very wet except for the West Coast. Cool over the South Island.

June 2010 was a very wet month for most regions of the country, with active lows originating over the Tasman Sea affecting the country during both the first and last week of the month. Double normal June rainfall was recorded in Marlborough and parts of the Bay of Plenty and Waikato.

July: Mid-winter magic – very sunny and settled.

July was characterised by higher than normal pressures over the country. The frequent highs brought clear skies, dry conditions, warmer afternoons but colder mornings to many regions. Southeast winds frequently affected New Zealand over the month, and the effects of these were very clear – western regions of the country were extremely sunny and very dry.

August: Cloudy, warm and extremely wet.

Lower pressures than normal over the Tasman Sea and New Zealand brought frequent northerly air streams to the North Island during August, with more easterly winds over the South Island. It was an extremely wet August across most of the country. Rainfalls were well above normal (more than 150 percent of normal) for all of the North Island except Hawke's Bay, as well as in Nelson and Marlborough, and parts of Canterbury and Otago. Mean temperatures were above average (between 0.5 °C and 1.2 °C above average) across almost all regions of New Zealand. It was very cloudy over much of the country.

September: Wild westerlies – wet and windy.

September 2010 was characterised by extremely low mean sea-level pressures over New Zealand, bringing wild westerly winds. The effect of the stronger-than-normal westerly winds during September was very clear – rainfall was record high or well above average, and sunshine hours were well below average, in western areas of both islands. Many September wind records were broken during the month. It was also much cooler than usual in the west and south of the South Island, but warmer than average in eastern areas; both are trademarks of enhanced westerly circulation. Extremely warm temperatures affected the country at both the start and end of the month – but an intense southwesterly event from the 17th to the 24th brought snow to very

low levels in the far south, and record low temperatures there.

October: Spectacularly sunny and very dry in most areas.

Overall, October 2010 was extremely sunny and very dry in most regions. More anticyclones affected New Zealand than is typical for the time of year, resulting in a rather settled climate during the month. The exceptions were an extremely cold southerly event which affected the country on the 11th and 12th, and a subsequent wet period for the east coast of the North Island between the 13th and 15th. October rainfall was more than double normal (at least 200 percent) in Gisborne and Hawke's Bay, but for the remainder of the country it was very dry. Sunshine totals were well above average (more than 125 percent of normal) across most of the South Island, and the north and west of the North Island. Many October sunshine records were broken. Extremely cold temperatures affected the country on the 11th and 12th, followed by unusually warm spells on the 16th and 30th.

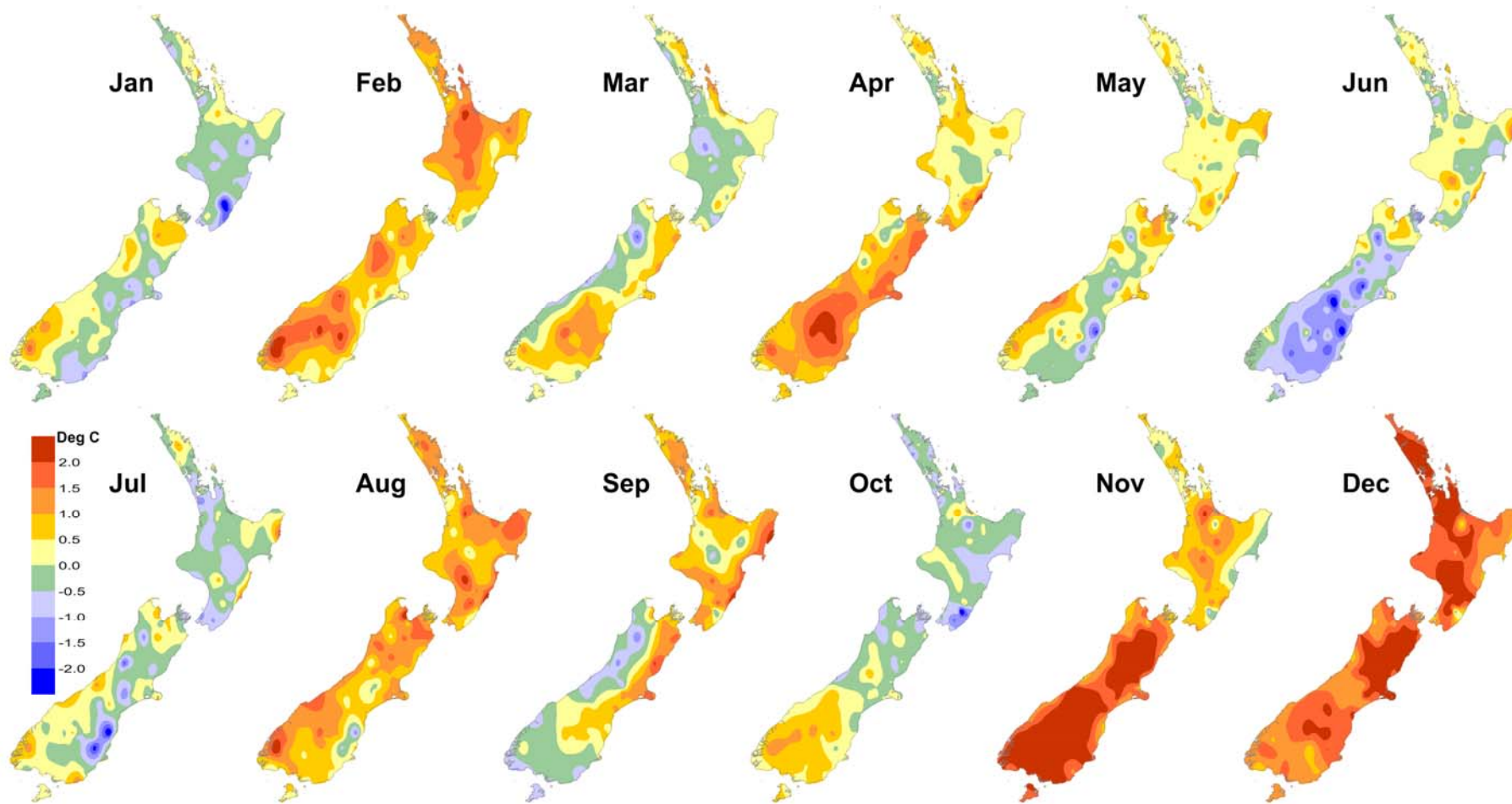
November: Highs and dryness continued to dominate. Record warm in South Island.

Anticyclones again dominated New Zealand's climate, producing record low November rainfall in the north and west of both islands, and record November warmth for the South Island (more than 2 °C above average). This was the second month in a row in which rainfall had been extremely low for most regions, resulting in unusually dry soils for the time of year across northern and western regions of the North Island, and the northwest of the South Island. Severe soil moisture deficits (more than 130 mm of deficit) existed as at the end of the month in Northland, Auckland, parts of the Waikato, Nelson, the southern Lakes District and central Otago, with significant soil moisture deficits (more than 110 mm of deficit) elsewhere in the Waikato, Taupo, parts of the Manawatu and Gisborne, in Hawke's Bay and the Wairarapa, Marlborough, and parts of Canterbury. An extremely hot (record breaking) spell occurred across the country on the 28th to 30th, with numerous November extreme maximum temperature records broken in both islands.

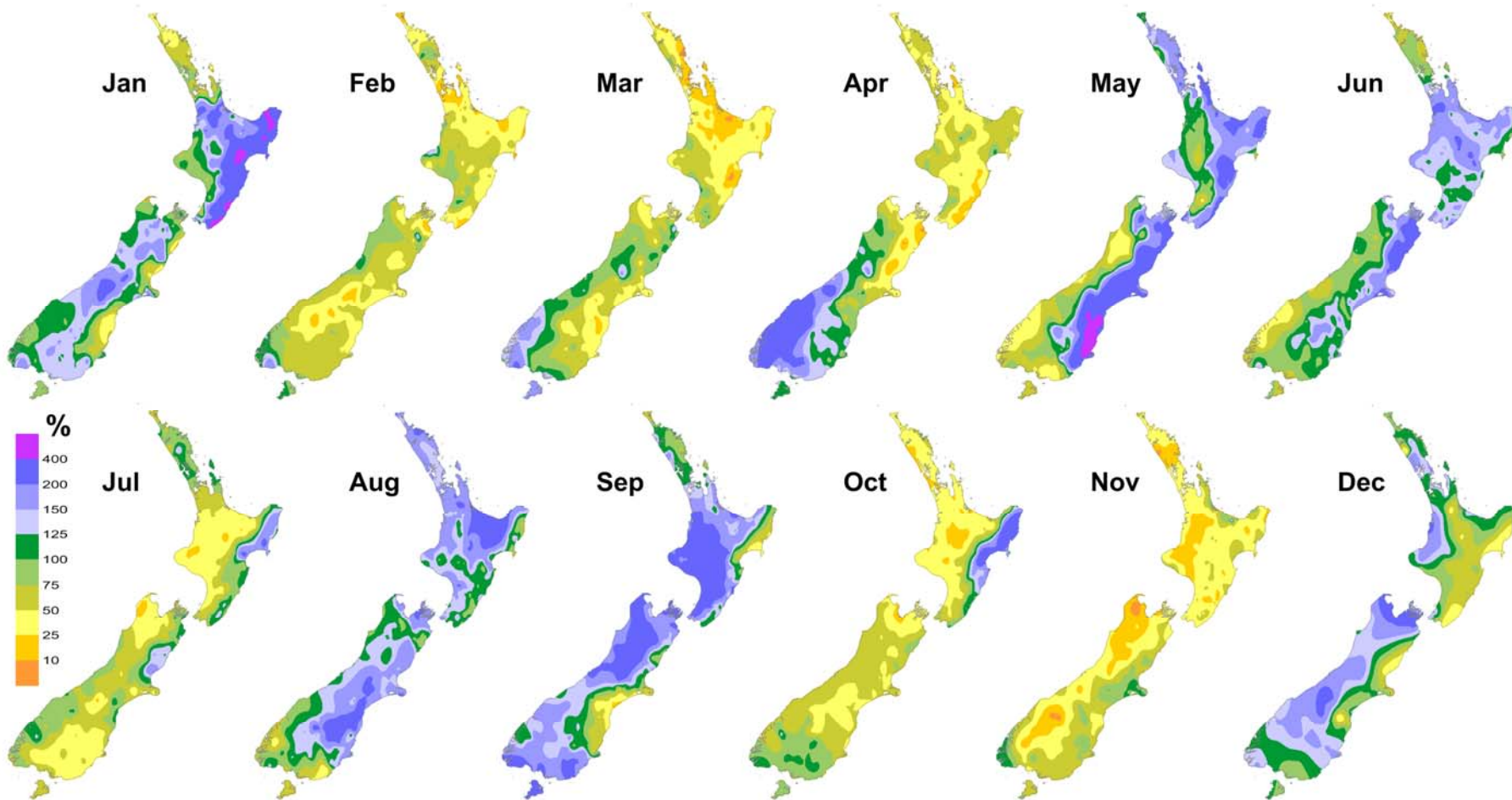
December: Warm with a sting in the tail.

In December 2010 there were more anticyclones ('highs') to the east of the North Island than is typical for the time of year, resulting more airflows from the north and northwest than normal. This resulted in well above average temperatures and below average sunshine hours for most places. December rainfall was more than double normal (at least 200 percent) in parts of Northland, Tasman, Nelson, Marlborough and in parts of the Southern Alps. Much of this rain fell during a severe storm which passed over the country on the 27th and 28th of the month. Rainfall was approximately one and a half times normal (about 150 percent) in parts of Auckland, Coromandel, coastal Waikato, Taranaki, Wellington, Buller, West Coast, Otago and Southland.

Section 3: Monthly temperature anomaly (departures in Degrees Celsius from monthly average). Figure shows monthly temperature anomalies for each month of 2010, starting in the top left with January.



Section 4: Monthly rainfall anomaly (departures as percentage from monthly normal). Figure shows monthly rainfall anomalies for each month of 2010, starting in the top left with January.



Section 5: The numbers

NIWA analyses of month-by-month records show:

- Whangaparaoa recorded the highest annual average temperature for 2010 (16.5°C), followed by Whangarei with 16.4 °C and Kaitaia with 16.1 °C.
- The highest recorded extreme temperature of the year (35.6 °C) occurred in Cheviot on 22 February (the second highest February temperature recorded there). The second highest temperature for the year was 34.3 °C in Blenheim on 1 January, and the third highest was 32.9 °C in Waiau recorded on 29 November (the second highest November temperature recorded there).
- The lowest air temperature of the year was -12.6°C recorded at Lake Tekapo on 10 August (the second lowest August temperature recorded there), followed by -10.7°C on 9 June, also at Lake Tekapo, and -9.6 °C at Hanmer Forest on 12 July.
- The national average temperature for 2010 based on a 7-station series was 13.1 °C, 0.5 °C above the 1971–2000 annual average. 2010 was the 5th warmest year since 1900, based on this 7-station series.
- The highest recorded wind gust for the year (as archived in the NIWA climate database) was 217 km/h at Baring Head, Wellington, on 12 March (a new all-time record there). The second highest wind gust was 204 km/hr recorded at Cape Turnagain on 23 September, followed by 178 km/hr at Secretary Island, Fiordland, on 18 February.
- Milford Sound received the top 1-day rainfall in 2010 (314 mm on 25 April, the second highest April daily value there), followed by Mount Cook (313 mm on 27 December) and North Egmont (255 mm on 13 August).
- The driest rainfall recording locations were all in Central Otago: Clyde with 389 mm of rainfall recorded for the year, followed by Ranfurly with 434 mm, and then Alexandra with 442 mm.
- Of the regularly reporting gauges, Cropp River in the Hokitika River catchment recorded the highest rainfall with 12374 mm, followed by Doon (Fiordland) with 7917 mm, then North Egmont with 7081 mm.
- Of the six main centres, for 2010 as a whole, Tauranga was the sunniest (2414 hours), Wellington the wettest (1503 mm), Christchurch the driest (660 mm), and Auckland the warmest (15.9 °C).
- Whakatane was the sunniest location in 2010, recording 2561 hours, followed by Nelson (2474 hours) and Blenheim (2415 hours).

Ranked annual means and totals for all available stations are displayed on the following page.

Location	Mean temp (°C)
Whangaparaoa	16.5
Whangarei	16.3
Kaitaia	16.1
Kaikohe	15.9
Wiri (Auckland)	15.9
Auckland (Aero)	15.9
Kerikeri	15.8
Tauranga	15.7
Dargaville	15.6
Port Taharoa	15.4
Paeroa	15.3
Hicks Bay	15.2
Whitianga	15.1
Warkworth	14.9
Whakatane	14.7
Gisborne	14.7
Te Puke	14.6
Ngawi	14.5
Farewell Spit	14.5
Whatawhata	14.4
Wanganui	14.4
Pukekohe	14.3
Napier	14.3
New Plymouth	14.2
Wairoa, North Clyde	14.2
Mahia	14.2
Hamilton	14.1
Wellington (Aero)	13.8
Nelson	13.8
Whakatu	13.7
Castlepoint	13.7
Te Kuiti	13.6
Motueka, Riwaka	13.6
Palmerston North	13.5
Paraparaumu	13.4
Levin	13.4
Martinborough	13.3
Blenheim	13.1
Westport	13.1
Rotorua	13.0
Wellington, Kelburn	13.0
Wallaceville	12.9
Kaikoura	12.7
Darfield	12.4
Taupo	12.3
Reefton	12.3
Rangiora	12.2
Stratford	12.1
Hokitika	12.1
Lincoln	12.1
Christchurch (Aero)	12.0
Chatham Islands	12.0
Haast	11.9
Winchmore	11.9
Le Bons Bay	11.8
Dunedin, Musselburgh	11.6
Puysegur Point	11.5
Franz Josef	11.4
Wanaka	11.3
Timaru	11.1
Milford Sound	11.0
Clyde	11.0
Hanmer Forest	10.8
Manapouri, West Arm	10.8
Tiwai Point	10.7
Dunedin (Aero)	10.5
Windsor	10.5
Tara Hills	10.4
Invercargill	10.4
Nugget Point	10.3
Queenstown	10.1
Lumsden	10.0
Gore	9.9
Mt Cook	9.5
Lake Tekapo	9.5
Mt Ruapehu	8.0

Location	Rainfall (mm)
Cropp River	12374
Doon	7917
North Egmont	7081
Milford Sound	6763
Mt Cook	4737
Hokitika	2909
Motu	2314
Whitianga	2191
Stratford	1986
Westport	1808
Reefton	1807
Hicks Bay	1593
Whakatane	1573
New Plymouth	1559
Rotorua	1436
Kaikohe	1357
Tauranga	1325
Motueka, Riwaka	1291
Hanmer Forest	1261
Hamilton	1236
Wallaceville	1181
Gisborne	1180
Pukekohe	1163
Manapouri	1157
Invercargill	1102
Kaitaia	1095
Paeroa	1068
Wellington (Aero)	1057
Nelson	1008
Whangarei	1005
Tiwai Point	987
Napier	974
Paraparaumu	967
Auckland (Aero)	958
Levin	930
Appleby	929
Palmerston North	928
Gore	915
Taupo	899
Wanganui	887
Queenstown	844
Blenheim	826
Winchmore	818
Dunedin, Aero	816
Darfield	770
Martinborough	738
Kaikoura	737
Dunedin, Musselburgh	728
Cape Campbell	699
Lincoln	687
Nugget Point	677
Christchurch (Aero)	660
Le Bons Bay	650
Lake Tekapo	624
Timaru	617
Rangiora	589
Wanaka	533
Tara Hills	530
Middlemarch	487
Alexandra	442
Ranfurly	434
Clyde	389

Location	Sunshine (hr)
Whakatane	2561
Nelson	2474
Blenheim	2415
Tauranga	2414
Takaka	2355
Lake Tekapo	2346
Gisborne	2224
New Plymouth	2176
Auckland, Mangere	2088
Dargaville	2053
Paraparaumu	2046
Christchurch (Aero)	2041
Wellington, Kelburn	2013
Hamilton, Ruakura	2010
Martinborough	1972
Dunedin, Musselburgh	1879
Stratford	1875
Invercargill	1821
Hokitika	1809
Palmerston North	1732
Mt Cook	1592
Franz Josef	1517

Section 6: Temperature – Above average annual mean temperatures in the northeast North Island, Nelson, Marlborough, parts of Canterbury and Westland, Fiordland, and in the Lakes District and central Otago.

Mean annual temperatures were above average (between 0.5 °C and 1.2 °C above the long-term average) in the northeast of the North Island, and in Nelson, Marlborough, parts of Canterbury, Fiordland and parts of Westland, the southern Lakes District and central Otago. Mean annual temperatures were near average elsewhere (within 0.5 °C of the long-term average). Heat waves affected the West Coast of the South Island over the period 29 January–1 February, central Otago during 8–9 March, and many areas of both islands between 28–30 November and 12–15 December. The national average temperature for 2010 based on a 7-station series was 13.1 °C, 0.5 °C above the 1971–2000 annual average. 2010 was the 5th warmest year since 1900, based on this 7-station series.

Overall, it was the warmest year on record at Whangaparaoa (Auckland), with a mean annual temperature of 16.5 °C – this was the highest mean annual temperature observed nationally. It was also the warmest year on record at Whenuapai, Te Puke, Reefton, Motueka, Lake Rotoiti, Nelson, Arthurs Pass, Tara Hills, Cromwell and Alexandra. Mean annual temperatures were also near-record at sites in Northland, Bay of Plenty, parts of Hawke’s Bay and Tararua District, in the northwest of the South Island, and in parts of Marlborough, Canterbury and Central Otago, as well as at Mt. Cook.

Table 1: Near-record or record high or low* annual average temperatures for 2010:

Location	Mean temperature (°C)	Departure (°C)	Year records began	Comments
Mean Temperature				
Kerikeri	15.8	0.5	1981	2nd-highest
Whangarei	16.4	0.7	1967	2nd-highest
Whangaparaoa	16.5	1.1	1982	Highest
Whenuapai	15.3	0.8	1945	Highest
Tauranga	15.7	1.1	1913	2nd-highest
Te Puke	14.6	0.7	1973	Highest
Whakatane	14.7	0.6	1974	4th-highest
Auckland	16.0	0.7	1959	2nd-highest
Dannevirke	13.3	0.8	1951	3rd-highest
Hastings	14.3	0.3	1965	3rd-highest
Ohakune	11.0	0.8	1962	2nd-highest
Farewell Spit	14.5	0.9	1971	2nd-highest
Westport	13.2	0.7	1937	4th-highest
Lake Rotoiti	10.3	1.2	1965	Highest
Reefton	12.3	1.0	1960	Highest
Motueka, Riwaka	13.7	1.3	1956	Highest
Nelson	13.8	0.9	1943	Highest
Blenheim	13.7	0.8	1941	2nd-highest
Arthurs Pass	8.5	0.9	1978	Highest
Culverden	11.9	0.6	1928	4th-highest
Mt Cook	9.5	0.7	1929	3rd-highest
Waipara West	12.9	0.7	1973	3rd-highest
Darfield	12.4	0.8	1939	3rd-highest
Le Bons Bay	11.9	0.6	1984	2nd-highest
Tara Hills	10.5	1.0	1949	Highest
Wanaka	11.4	0.9	1955	4th-highest

* Note that there were no low annual average temperature records set in 2010.

Cromwell	12.4	1.6	1949	Highest
Alexandra	11.6	1.1	1983	Highest
Mean Maximum Temperature				
Kaitaia	20.1	0.1	1985	4th-highest
Kerikeri	20.6	0.6	1981	2nd-highest
Whangarei	20.5	0.8	1967	2nd-highest
Whangaparaoa	19.8	1.8	1982	Highest
Whenuapai	19.6	0.5	1945	3rd-highest
Tauranga	19.9	0.9	1913	3rd-highest
Te Puke	19.5	0.7	1973	2nd-highest
Whakatane	19.6	0.3	1974	4th-highest
Auckland	19.6	0.8	1959	3rd-highest
Dannevirke	17.7	0.8	1951	4th-highest
Hastings	19.7	0.6	1965	4th-highest
Wallaceville	18.1	1.2	1939	Highest
Wanganui	18.5	0.7	1937	3rd-highest
Takaka	18.6	0.8	1978	4th-highest
Westport	17.1	0.9	1937	3rd-highest
Lake Rotoiti	16.3	1.8	1965	Highest
Reefton	17.7	1.1	1960	2nd-highest
Milford Sound	15.4	0.8	1934	3rd-highest
Motueka, Riwaka	20.0	2.0	1956	Highest
Appleby	18.5	1.1	1943	Highest
Nelson	18.6	1.3	1943	Highest
Blenheim	19.0	0.8	1932	4th-highest
Hanmer Forest	18.0	1.4	1906	3rd-highest
Kaikoura	16.2	0.5	1963	4th-highest
Arthurs Pass	12.9	0.9	1978	2nd-highest
Mt Cook	15.4	1.5	1929	Highest
Winchmore	17.8	1.4	1928	3rd-highest
Le Bons Bay	15.1	0.6	1984	2nd-highest
Lake Tekapo	15.4	1.1	1927	2nd-highest
Tara Hills	17.0	1.5	1949	Highest
Wanaka	16.9	1.1	1955	4th-highest
Cromwell	18.5	1.8	1949	Highest
Alexandra	17.8	0.9	1983	4th-highest
Mean Minimum temperature				
Whangarei	12.3	0.6	1967	4th-highest
Whenuapai	10.9	1.1	1945	2nd-highest
Whitianga	10.9	1.1	1962	2nd-highest
Te Puke	9.7	0.6	1973	4th-highest
Auckland	12.4	0.6	1959	3rd-highest
Whatawhata	9.9	0.6	1952	2nd-highest
Dannevirke	8.9	0.9	1951	2nd-highest
Ohakune	6.3	0.8	1962	2nd-highest
Farewell Spit	11.1	1.5	1971	2nd-highest
Lake Rotoiti	4.4	0.7	1965	2nd-highest
Hokitika	8.2	0.6	1963	4th-highest
Reefton	7.0	1.0	1960	Highest
Nelson	9.0	0.6	1943	3rd-highest
Blenheim	8.4	0.8	1941	Highest

Cape Campbell	11	1.7	1953	2nd-highest
Arthurs Pass	4.1	0.9	1978	Highest
Culverden	6.3	1.2	1928	Highest
Waipara West	7.8	1.1	1973	2nd-highest
Darfield	7.3	1.1	1939	Highest
Orari Estate	6.0	0.8	1972	Highest
Timaru	7.2	1.4	1885	3rd-highest
Tara Hills	4.0	0.6	1949	4th-highest
Cromwell	6.3	1.5	1949	Highest
Alexandra	5.4	1.3	1983	Highest

New records for annual temperature extremes were set on the West Coast of the South Island on 31 January, linked to foehn warming in the lee of the Southern Alps during a sub-tropical easterly wind event.

An extreme cold spell affected New Zealand from 10–13 July, caused by an intense winter anticyclone over New Zealand. The anticyclone produced clear skies, light winds, and severe frosts, with several sites in the western North Island, as well as Queenstown and Dunedin, recording annual extreme minimum temperatures on July 12th. An intensely cold southwesterly event during 17–24 September in Southland brought snow to very low levels and record low afternoon temperatures on September 18.

Table 2: Near-record or record high or low annual temperature extremes for 2010:

Location	Temperature (°C)	Date of occurrence	Year records began	Comments
Highest extreme maximums				
Whangarei	31.5	Dec-22nd	1967	Highest
Westport	28.5	Jan-31st	1937	2nd-highest
Hokitika	27.7	Jan-31st	1963	4th-highest
Nugget Point	28.8	Feb-22nd	1970	4th-highest
Highest extreme minimums				
Taupo	19.4	Dec-22nd	1950	4th-highest
Hamilton	21.8	Dec-22nd	1940	2nd-highest
Hastings	21.1	Dec-22nd	1972	3rd-highest
Hawera	18.9	Dec-19th	1977	3rd-highest
Ohakune	17.0	Dec-21st	1972	4th-highest
Kaikoura	20.0	Feb-25th	1972	3rd-highest
Waipara West	21.0	Dec-21st	1973	4th-highest
Lowest extreme maximums				
Castlepoint	6.8	Aug-09th	1972	3rd-lowest
Arthurs Pass	0.2	May-27th	1973	2nd-lowest
Manapouri	2.0	Jun-26th	1973	4th-lowest
Tiwai Point	5.3	Sep-18th	1972	3rd-lowest
Nugget Point	2.5	Sep-18th	1972	Lowest
Lowest extreme minimums				
Warkworth	-0.7	Jul-11th	1966	3rd-lowest
Hawera	-4.4	Jul-12th	1977	Lowest
Queenstown	-7.2	Jul-12th	1871	2nd-lowest

Section 7: Rainfall – Near average for many regions. Above normal for eastern parts of the North Island, Blenheim, parts of north Canterbury.

In general terms, six months of the year were wetter than normal and six were drier than normal (with clear geographical exceptions). This meant that annual rainfall totals for 2010 as a whole were in the near normal range (85 to 120 percent of normal) across most of the country. The exceptions were eastern parts of the North Island (specifically Coromandel, parts of the Bay of Plenty, Gisborne, Hawke’s Bay, Wairarapa), Blenheim, parts of North Canterbury and southwest Fiordland, which experienced above normal annual rainfall (with totals more than 120 percent of normal). In contrast, areas of Northland, Auckland and Waikato, Otago, the Lakes District and parts of the West Coast and Buller recorded below normal annual rainfall totals (between 50 and 85 percent of normal).

Table 3: Near-record or record annual rainfall for the year 2010:

Location	Rainfall (mm)	Percentage of normal	Year records began	Comments
Blenheim	1016	137	1927	2nd-highest
Lumsden	920	108	1982	4th-highest
Alexandra	442	121	1983	3rd-highest
Whangarei	1005	72	1937	4th-lowest
Kumeu (Auckland)	1135	88	1978	4th-lowest
Nugget Point	677	72	1930	4th-lowest

The driest rainfall recording locations were all in Central Otago: Clyde with 389 mm of rainfall recorded for the year, followed by Ranfurly with 434 mm, and then Alexandra with 442 mm. Of the regularly reporting gauges, Cropp River in the Hokitika River catchment recorded the highest rainfall with 12374 mm, followed by Doon (Fiordland) with 7917 mm, then North Egmont with 7081 mm.

Milford Sound received the top 1-day rainfall in 2010 (314 mm on 25 April, the second highest April total there), followed by Mount Cook (313 mm on 27 December) and North Egmont (255 mm on 13 August).

A record high annual 1-day rainfall extreme occurred at Whakatane on 1 June, with 170 mm of rainfall recorded there in the 24 hours.

Table 4: One day rainfall extremes for 2010:

Location	1-day extreme rainfall (mm)	Date	Year records began	Comments
Dargaville	109	Dec-17th	1943	3rd-highest
Whakatane	170	Jun-01st	1952	Highest
Castlepoint	160	Jan-22nd	1907	2nd-highest
Tara Hills	85	Dec-27th	1949	2nd-highest
Dunedin Aero (Taieri)	79	May-28th	1962	3rd-highest
Manapouri	79	Apr-25th	1963	3rd-highest
Alexandra	43	Dec-27th	1983	2nd-highest

Section 8: Sunshine – Very sunny in the western North Island, and the west and south of the South Island. Near normal sunshine totals elsewhere.

It was a sunny year in the north and west of the North Island, and in the west and south of the South Island, with above normal annual sunshine hours observed (between 110 and 130 percent of normal). It was the sunniest year on record for Te Kuiti, since records began there in 1962. Elsewhere across the country, annual sunshine hours were nearer to normal, ranging between 95 and 105 percent of normal.

Whakatane was the sunniest location in 2010, recording 2561 hours, followed by Nelson (2474 hours) and Blenheim (2415 hours).

Table 5: Near-record or record high sunshine hours for the year 2010:

Location	Sunshine (hours)	Percent of normal	Records began	Comments
Kaitaia	2279	109	1985	2nd-highest
Dargaville	2053	110	1943	4th-highest
Te Kuiti	1988	118	1962	Highest
Taumarunui	1965	121	1947	2nd-highest
Turangi	2081	107	1976	4th-highest
Paraparaumu	2255	111	1953	2nd-highest
Greymouth	2015	120	1947	2nd-highest
Balclutha	2062	127	1964	2nd-highest

Section 9: 2010 climate in the six main centres

Of the six main centres, for 2010 as a whole, Tauranga was the sunniest of the main centres, Wellington the wettest, Christchurch the driest, and Auckland the warmest.

Auckland, Tauranga, Hamilton and Dunedin recorded mean annual temperatures that were above average, while mean annual temperatures at Wellington and Christchurch were close to the annual average. Rainfall at Wellington was above normal, while at all of the remaining main centres it was in the near normal range (between 80 and 119 percent of annual normal). Annual sunshine totals in 2010 were in the near normal range for all of the main centres except for Dunedin, where annual sunshine totals were above normal.

Table 6: 2010 Climate in the six main centres

Location	Mean temp. (°C)	Departure from normal (°C)		Rainfall (mm)	% of normal		Sunshine (hours)	% of normal	
Auckland ^a	15.9	+0.6	Above average	958	87%	Near normal	2088 ^b	104%	Near normal
Tauranga ^c	15.7	+1.1	Above average	1325	109%	Near normal	2414	107%	Near normal
Hamilton ^d	14.1	+0.6	Above average	1236	102%	Near normal	2010 ^e	100%	Near normal
Wellington ^f	13.1	+0.3	Near average	1503	120%	Above normal	2013	98%	Near normal
Christchurch ^g	12.0	+0.4	Near average	660	105%	Near normal	2041	97%	Near normal
Dunedin ^h	11.6	+0.5	Above average	728	90%	Near normal	1879	118%	Above normal

^a Auckland Airport ^bMangere ^cTauranga Airport ^dHamilton Airport ^eRuakura ^fKelburn ^gChristchurch Airport ^hMusselburgh

Section 10: Significant extremes

Floods

There were a relatively low number of heavy rainfall events during 2010, due to the largely settled nature of the year. The worst flooding events during 2010 included: an exceptionally heavy rainfall event on 31 January, associated with a humid easterly airstream and embedded thunderstorms, which affected the northeast of the North Island, in particular Coromandel, Bay of Plenty, Gisborne and Hawke's Bay; widespread heavy rainfall and flooding over the southwestern South Island between 25–27 April which resulted in very high (flood threshold) levels of Lake Wakatipu; a sustained period of heavy rainfall between 24 and 30 May across the east of the South Island, which caused numerous floods, slips, river breaches, road and property damage, and heavy rainfall on 27–28 December which led to flooding on the West Coast, Nelson and Marlborough.

Snow

The most significant snowfall event of the year occurred during 15–23 September, with heavy snowfalls observed in the southwest of the South Island. On 18 September, conditions were particularly extreme, causing the roof of Stadium Southland in Invercargill to collapse. Other parts of Southland were also affected, meaning milk was unable to be collected because of dangerous roads, and thousands of lambs were lost across the region.

Wind

The months of January, March and September were windy, otherwise the year as a whole was relatively settled, due to the prevalence of anticyclones over New Zealand. Of particular note was the widespread wind damage that occurred over many regions of New Zealand during 17–23 September, associated with a period of very intense southwesterly winds over much of the country.

Drought

Drought was declared in Northland in January 2010, after a three-month period of extremely low rainfall in the region. Severe soil moisture deficits (more than 130 mm of deficit) continued in Northland during February, and developed in parts of Auckland, Marlborough, Canterbury and Otago during March as the dryness continued. At the end of March, significant soil moisture deficits (more than 110 mm of deficit) had also developed in Waikato, Bay of Plenty, Coromandel, Taupo and parts of Gisborne and Hawke's Bay. Drought was declared for Auckland, Waikato, Bay of Plenty, South Taranaki, South Canterbury and Otago in April. Even after some helpful rainfall at the end of April, significant soil moisture deficits remained in many areas of the North Island (except for Taranaki, Gisborne, and the Kapiti Coast), as well as in Marlborough and Canterbury. The drought finally broke in May. But by the end of October, unusually large soil moisture deficits had again developed in much of Northland, coastal Nelson, mid Canterbury, and North Otago. As a result of the extremely low rainfall experienced in November, severe soil moisture deficits were in evidence by the end of the month in Northland, Auckland, parts of the Waikato, Nelson, the southern Lakes District and central Otago, with significant soil moisture deficits (more than 110 mm of deficit) elsewhere in the Waikato, Taupo, parts of the Manawatu and Gisborne, in Hawke's Bay and the Wairarapa, Marlborough, and parts of Canterbury. Drought was again declared in Northland, Waikato and the Ruapehu district in December.

Further detailed information about significant climate and weather events for 2010 is attached.

For media comment, please contact:

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Note for editors:

Climate measurements have been made in New Zealand for about 150 years, with reasonable coverage of reliable data from at least 1900. NIWA makes its raw climate data publicly available for free on-line. Journalists are advised, however, to take extreme care when interpreting trends from raw data to ensure they have not been compromised by changes in site location, urbanisation, exposure, or instrumentation over time. If in any doubt, please call us.

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Significant weather and climate events – 2010

Section 11: High temperatures

2010 was notable for seven warmer than normal months (February, April, May, August, September, November and December). Many new records of extreme monthly maximum temperatures were set during these months. Heat waves affected the West Coast of the South Island over the period 29 January–1 February associated with easterly winds and foehn warming in the lee of the Southern Alps, and central Otago sweltered during 8–9 March. Many areas of both islands broke all-time November extreme temperature records between 28 and 30 November, caused by an intense late-spring anticyclone which produced calm, sunny conditions and very warm afternoon temperatures. Similar conditions resulted in record December maximum temperatures being set on 12 – 15 and 27 December at multiple sites in the North Island.

Table 7: Extremes of high daily maximum temperature in 2010 were recorded at:

Location	Maximum temperature (°C)	Date of occurrence	Records began	Comments
January				
Kaitia	28.4	29th	1985	Equal 3rd-highest
Whangaparaoa	28.6	30th	1982	Highest
Wallaceville	30.3	29th	1939	3rd-highest
Hawera	26.6	20th	1977	2nd-highest
Westport	28.5	31st	1937	Highest
Hokitika	27.7	31st	1963	3rd-highest
Milford Sound	27.9	31st	1934	2nd-highest
Puysegur Point	23.1	17th	1978	4th-highest
Le Bons Bay	28.7	2nd	1984	3rd-highest
Woodbury	33.0	1st	1973	4th-highest
February				
Kerikeri	30.4	14th	1981	Highest
Whangaparaoa	27.3	17th	1982	2nd-highest
Westport	28.3	1st	1937	Highest
Reefton	32.3	2nd	1960	3rd-highest
Greymouth	28.7	1st	1947	Highest
Milford Sound	28.5	1st	1934	Highest
Arthurs Pass	28.0	3rd	1978	4th-highest
Cheviot	35.6	22nd	1982	2nd-highest
Wanaka	33.0	4th	1955	4th-highest
Lumsden	29.0	6th	1982	Equal 2nd-highest
Cromwell	34.2	5th	1949	4th-highest
March				
Kaikohe	26.5	28th	1973	Equal 3rd-highest
Leigh	26.6	20th	1966	2nd-highest
Whangaparaoa	27.0	5th	1982	Highest
Whakatane	28.3	11th	1975	3rd-highest
Auckland	27.4	1st	1959	3rd-highest
Takaka	27.7	19th	1978	4th-highest
Motueka	28.2	26th	1956	4th-highest
Appleby	27.8	15th	1943	3rd-highest
Arthurs Pass	25.8	8th	1973	4th-highest
Mt Cook	28.4	15th	1929	Equal 4th-highest
Le Bons Bay	27.1	14th	1984	2nd-highest
Wanaka	30.0	8th	1955	2nd-highest
Cromwell	32.7	9th	1949	Highest
Alexandra	32.0	9th	1983	4th-highest
April				
Kaikohe	25.3	4th	1973	2nd-highest
Whangaparaoa	23.8	4th	1982	3rd-highest
Whakatane	24.9	5th	1975	Equal 4th-highest
Ngawi	24.3	27th	1972	4th-highest
Takaka	23.9	1st	1978	4th-highest
Cheviot	27.4	11th	1982	3rd-highest
Waipara West	27.5	1st	1973	3rd-highest

Darfield	28.6	1st	1939	4th-highest
Woodbury	27.0	1st	1973	Equal 4th-highest
May				
Kerikeri	22.5	13th	1981	Equal 3rd-highest
Leigh	23.5	13th	1966	Highest
Whangaparaoa	21.8	13th	1982	Equal highest
Port Taharoa	23.3	10th	1973	2nd-highest
Wanganui	22.4	13th	1987	Equal 2nd-highest
Puyssegur Point	19.6	6th	1978	2nd-highest
Motueka	25.1	13th	1956	Highest
Cheviot	25.0	13th	1982	Highest
Woodbury	25.0	7th	1973	3rd-highest
June				
Kerikeri	21.0	2nd	1981	Equal 3rd-highest
Leigh	20.3	2nd	1966	2nd-highest
Whangaparaoa	19.0	2nd	1982	3rd-highest
Motueka	21.8	7th	1956	Highest
Nelson	18.7	7th	1943	Equal 2nd-highest
Waipara West	22.2	19th	1973	3rd-highest
Lumsden	16.5	19th	1982	4th-highest
July				
Kaikohe	19.0	29th	1973	Highest
Westport	17.8	22nd	1937	Equal highest
Lake Rotoiti	13.9	25th	1965	Highest
Motueka	18.7	2nd	1956	Highest
Kaikohe	19.0	29th	1973	Highest
August				
Kerikeri	20.2	28th	1981	3rd-highest
Kaikohe	18.5	31st	1973	4th-highest
Leigh	19.6	28th	1966	Equal highest
Whangaparaoa	18.6	28th	1982	Equal 2nd-highest
Kumeu	18.6	17th	1978	Equal 3rd-highest
Lake Rotoiti	16.3	14th	1965	4th-highest
Reefton	18.5	15th	1960	Highest
Haast	18.4	30th	1949	4th-highest
Motueka	21.9	15th	1956	Highest
Kerikeri	20.2	28th	1981	3rd-highest
September				
Kaikohe	21.2	27th	1973	3rd-highest
Dargaville	22.3	29th	1943	4th-highest
Leigh	20.4	26th	1966	4th-highest
Whangaparaoa	20.8	27th	1982	3rd-highest
Kumeu	21.4	28th	1978	2nd-highest
Hamilton	22.3	29th	1906	2nd-highest
Takapau Plains	22.1	29th	1962	Highest
Hicks Bay	21.3	27th	1969	4th-highest
Hawera	19.3	29th	1977	2nd-highest
Wanganui	21.2	29th	1987	3rd-highest
Motueka	23.5	26th	1956	Highest
Kaikoura	24.6	6th	1963	3rd-highest
October				
Kaikohe	22.3	23rd	1973	Equal highest
Whatawhata	23.0	29th	1952	2nd-highest
Lake Rotoiti	23.7	23rd	1965	3rd-highest
Hokitika	21.5	30th	1963	Equal 3rd-highest
Reefton	26.2	14th	1960	Highest
Milford Sound	22.7	16th	1934	Equal 3rd-highest
November				
Kaitaia	24.6	27th	1985	Equal-Highest
Leigh	24.4	26th	1966	Equal 2nd-highest
Warkworth	25.7	28th	1966	Highest
Whangaparaoa	24.9	28th	1982	Highest
Whenuapai	25.1	28th	1945	Equal 4th-highest
Whitianga	26.8	17th	1962	2nd-highest
Pukekohe	25.2	28th	1969	4th-highest
Whatawhata	26.6	28th	1952	2nd-highest
Hamilton	28.3	28th	1946	Highest
Te Kuiti	27.5	28th	1959	2nd-highest

Taumarunui	29.8	28th	1947	3rd-highest
Turangi	29.2	30th	1968	Highest
New Plymouth	26.4	27th	1944	Highest
Masterton	30.2	29th	1906	2nd-highest
Takapau Plains	25.8	29th	1962	4th-highest
Dannevirke	26.3	29th	1951	3rd-highest
Martinborough	30.7	29th	1986	Highest
Wallaceville	26.6	29th	1939	2nd-highest
Ngawi	28.2	18th	1972	2nd-highest
Wallaceville	26.6	29th	1939	2nd-highest
Stratford	24.8	28th	1960	Highest
Ohakune	26.5	29th	1962	2nd-highest
Waiouru	25.2	29th	1962	Highest
Takaka	27.8	13th	1978	2nd-highest
Lake Rotoiti	29.9	29th	1965	Highest
Farewell Spit	24.9	30th	1971	3rd-highest
Reefton	30.9	27th	1960	Highest
Motueka	29.8	17th	1956	Highest
Blenheim	31.0	18th	1932	3rd-highest
Hanmer Forest	30.6	18th	1906	Highest
Arthurs Pass	26.0	28th	1978	Highest
Mt Cook	28.6	28th	1929	Highest
Tara Hills	29.9	27th	1949	Highest
Wanaka	31.4	28th	1955	Highest
Queenstown	28.5	28th	1871	4th-highest
Lumsden	26.4	28th	1982	3rd-highest
Cromwell	32.3	28th	1949	Highest
Alexandra	31.6	29th	1983	Highest
Waiau	32.9	29th	1974	2nd-highest
Nugget Point	26.4	11th	1970	2nd-highest
Kaitaia	24.6	27th	1985	Equal-Highest
Leigh	24.4	26th	1966	Equal 2nd-highest
Warkworth	25.7	28th	1966	Highest
Whangaparaoa	24.9	28th	1982	Highest
Whenuapai	25.1	28th	1945	Equal 4th-highest
Whitianga	26.8	17th	1962	2nd-highest
Pukekohe	25.2	28th	1969	4th-highest
Whatawhata	26.6	28th	1952	2nd-highest
Hamilton	28.3	28th	1946	Highest
Te Kuiti	27.5	28th	1959	2nd-highest
December				
Dargaville	29.8	13th	1943	Highest
Whangarei	31.5	22nd	1967	Highest
Leigh	27.1	24th	1966	Highest
Warkworth	28.4	22nd	1966	Highest
Whangaparaoa	27.1	22nd	1982	2nd-highest
Kumeu, Auckland	28.3	21st	1978	2nd-highest
Whenuapai	29.1	21st	1945	Highest
Paeroa	29.2	12th	1947	Equal 3rd-highest
Hamilton	30.0	15th	1906	Equal 4th-highest
Takapau Plains	28.1	27th	1962	3rd-highest
Hastings	32.0	27th	1965	Equal 3rd-highest
Waiouru	24.6	15th	1962	4th-highest
Wanganui	29.0	27th	1987	Highest
Farewell Spit	24.9	31st	1971	3rd-highest
Puysegur Point	22.3	12th	1978	3rd-highest
Motueka, Riwaka	29.5	22nd	1956	Equal highest
Le Bons Bay	29.1	18th	1984	2nd-highest
Nugget Point	26.9	21st	1970	4th-highest

Section 12: Low temperatures and severe frost

2010 was notable for two cool months (January and October). Many minimum temperature records were broken on 18 March in central and western North Island locations, after a calm, clear night followed a cold southeasterly change. An extremely cold spell affected all of New Zealand between 10 and 13 July, caused by an intense winter anticyclone over the country. The anticyclone produced clear skies, light winds, and widespread severe frosts. Numerous sites experienced record or near-record low July minimum temperatures during this period. On December 9th, record low December minimum temperatures were observed in Central Otago, following an unusually cold southerly change and a clear, still night.

Table 8: Extremes of low daily minimum temperature in 2010 were recorded at:

Location	Minimum temperature (°C)	Date of occurrence	Records began	Comments
January				
Kaitaia	7.8	10th	1967	Equal 3rd-lowest
Warkworth	6.4	10th	1966	Equal lowest
Whangaparaoa	11.1	12th	1982	2nd-lowest
Taupo	2.0	9th	1976	4th-lowest
Kaitaia	7.8	10th	1967	Equal 3rd-lowest
Warkworth	6.4	10th	1966	Equal lowest
Whangaparaoa	11.1	12th	1982	2nd-lowest
Taupo	2.0	9th	1976	4th-lowest
Kaitaia	7.8	10th	1967	Equal 3rd-lowest
February				
Dunedin	1.3	16th	1947	Lowest
Queenstown	2.1	19th	1871	4th-lowest
Balclutha, Telford	1.0	8th	1964	Lowest
March				
Whangaparaoa	10.6	18th	1982	3rd-lowest
Taupo	-1.2	18th	1949	2nd-lowest
Hamilton	-0.3	18th	1946	2nd-lowest
Port Taharoa	5.4	18th	1973	Lowest
Te Kuiti	0.0	18th	1959	Lowest
Taumarunui	-2.8	18th	1947	Lowest
Turangi	-2.1	18th	1968	Lowest
Martinborough	1.1	18th	1986	Lowest
Paraparaumu	2.0	18th	1953	4th-lowest
Hawera	0.3	18th	1977	Lowest
Ohakune	-1.0	18th	1962	4th-lowest
Waiouru	-3.7	18th	1962	Lowest
Wanganui	4.1	18th	1937	Equal 4th-lowest
Kaikoura	3.5	13th	1963	Lowest
Arthurs Pass	-9.0	23rd	1978	Lowest
Cheviot	-1.5	18th	1982	2nd-lowest
April				
Turangi	-3.1	8th	1968	Equal lowest
Wanganui	3.4	9th	1987	4th-lowest
Dunedin (Airport)	-1.8	5th	1947	2nd-lowest
Balclutha	-2.3	5th	1964	Equal 2nd-lowest
July				
Warkworth	-0.7	11th	1966	Lowest
Port Taharoa	1.1	10th	1973	3rd-lowest
Te Kuiti	-4.3	12th	1959	Lowest
Taumarunui	-6.8	12th	1947	Lowest
Turangi	-7.6	12th	1968	Lowest
Takapau Plains	-3.6	11th	1962	Equal 4th-lowest
Hawera	-4.4	12th	1977	Equal lowest
Wanganui	-2.4	12th	1987	2nd-lowest
Blenheim	-4.9	13th	1932	Equal 2nd-lowest
Dunedin	-6.7	12th	1947	2nd-lowest
Queenstown	-7.2	12th	1871	3rd-lowest
August				
Warkworth	0.9	11th	1966	3rd-lowest

Lake Tekapo	-12.6	10th	1925	2nd-lowest
September				
Le Bons Bay	1.0	22nd	1984	Equal 3rd-lowest
Oamaru	-3.9	19th	1908	4th-lowest
Nugget Point	-0.8	18th	1970	Equal lowest
October				
Takaka	0.9	12th	1978	Equal 3rd-lowest
Greymouth	1.3	11th	1947	Equal 3rd-lowest
Appleby	-1.0	12th	1943	4th-lowest
Queenstown	-2.0	12th	1871	Equal 4th-lowest
November				
Warkworth	3.7	8th	1966	Lowest
Taumarunui	-1.6	7th	1947	Lowest
Turangi	-1.8	1st	1968	3rd-lowest
December				
Tara Hills	-2.3	9th	1949	Lowest
Dunedin	4.4	9th	1947	Equal 3rd-lowest
Manapouri	-2.1	9th	1963	Lowest
Queenstown	-0.4	9th	1871	Lowest
Lumsden	-2.0	9th	1982	Equal 2nd-lowest
Invercargill	-0.8	9th	1905	2nd-lowest
Balclutha	0.8	9th	1964	2nd-lowest

Section 13: Floods and high rainfall

In the 10 minutes before 2 pm on 7 January, Invercargill Airport recorded 8.4 mm of rain. The extreme rainfall was caused by an intense mid-afternoon thunderstorm, with hail covering northern and central Invercargill. Buildings throughout the CBD, including the Southland District Council and the Invercargill Public Library were flooded. The thunderstorm also caused electricity cuts, which affected 3500 customers in south Invercargill, Bluff and Awarua.

On 21 January, thunderstorm activity associated with a complex low over the country affected the Ida Valley, Central Otago, producing very intense rainfall rates.

On 22 January, heavy rain flooded streets in Flaxmere, near Hastings, and closed SH50 between Ongaonga and Tikokino. The flash flooding was caused by downpours from thunderstorms in the area. Overnight on 22–23 January, Hawke’s Bay experienced about 2000 lightning strikes. On 23 January, heavy rain caused a large slip on SH5, near Titiokura Summit, with one lane closed, and other sections of the road affected by flooding.

On 27 January, torrential rain caused flooding in the Fairy Springs Road area of Rotorua, and blocked SH1 near Lake Karapiro. Several homes in Cambridge were flooded. Again, the downpours were caused by thunderstorm activity, with a severe electrical storm centred directly over Hamilton City.

Exceptionally heavy rain, associated with moist easterly conditions and numerous embedded thunderstorms, affected the North Island on 31 January, causing slips, and floods, and closing SH5 between Napier and Taupo, and SH2 north of Gisborne. Rising floodwaters and debris buckled a bridge on the Waipaoa River, isolating more than 30 people at Waipaoa Station. Mangatuna village residents were moved out in the morning as the Uawa River rose, allowed to return several hours later, but were evacuated again in the afternoon. In the Coromandel, Hahei and the Hot Water Beach area were cut off by flooding on Hot Water Beach Road. Tairua was accessible from the north but not from the south, and SH25 at Onemana near Opoutere was blocked by flooding. In the Auckland region, homes were flooded on the Whangaparaoa Peninsula, North Shore, Auckland City, and Howick. A woman was trapped in her car by rising floodwaters underneath a motorway overpass in Ellerslie, and another driver was trapped by flood water in Remuera. Heavy rain on 22 March caused slips in Fiordland, closing the Milford Sound Road. About 200 trampers were stranded in huts on the Kepler, Milford, and Routeburn tracks after landslides blocked the tracks.

Heavy rain on 25 April caused flooding on the road to Milford Sound, stranding visitors. On 26 April, flooding closed SH94 from Milford Sound to Te Anau, and from Te Anau east to Mossburn. SH97 was closed between Five Rivers and Mossburn, and SH6 between Kingston and Athol was affected by surface water. About 120 trampers were evacuated by helicopter from the Milford Track. Te Anau residents were

without telephone links after flooding cut the main fibre optic cable at Whitestone Bridge at about 1:30 pm. An alternative radio link was set up about 7:30 pm. Mobile phone sites were also affected. A property in Lowther Rd, about 12 km north of Lumsden, was evacuated when floodwater flowed through the house. Fences on the property were also underwater. The Dart River breached its banks, flooding Kinloch Road, which was closed by the Queenstown Lakes District Council.

On 27 April, SH99 was closed between Underwood and Wallacetown. Thousands of hectares of farmland were under water after rivers overflowed, with many stock isolated on patches of higher ground. In Tuatapere, the Waiau River burst its banks flooding the Domain, and sending water through the rugby clubrooms. The domestic water supply and all electronic communication ceased at 1:33 am. Water supplies were re-instated about 8.45 am, but residents were asked to conserve water, and boil drinking water. On the Milford and Routeburn Tracks, several bridges were washed away, and there were many slips and washouts, causing track closures. Access roads into Mt Aspiring National Park were also damaged.

On 29 April, the high levels of Lake Wakatipu caused some roads and reserves on the Queenstown foreshore to be flooded, mainly due to wind-blown waves. At 8am on 30 April, Lake Wakatipu had risen to its "threshold" level where water overflowed on to foreshore streets and parks, but major flooding such as seen in 1999 was largely avoided because of flood protection measures.

On 16 May, Tapawera, south of Motueka, was flooded, with 22 families evacuated, some by helicopter. The Motueka River, and its tributaries, the Wangapeka and Baton Rivers, flooded over farmland, and closed roads, including Motueka Valley Highway, closed by a landslide.

Heavy rain on 24 May caused severe flooding on Main North Road on the outskirts of Christchurch, and forced the closure of Willowbank Wildlife Reserve. Six kiwi were moved from the flooded nocturnal house. Flooding also occurred in the Bay of Plenty, with the evacuation of one family in Whakatane, and the main road between Whakatane and Ohope blocked by a large slip.

Flooding occurred in Tawa and Titahi Bay (near Wellington) after heavy rain on 25 May, with one person rescued from a submerged car. Further south, several properties and businesses in Richmond, north of Oamaru, were evacuated, a property in York Street Oamaru was evacuated, as was the Oamaru Camping Ground. Schools in Oamaru were closed, as was the freezing works. The Kakanui Bridge, 14 km south of Oamaru, was closed at 7 pm. SH1 north of Oamaru was closed at Waitaki Bridge, and at the SH83 junction, with no detours available. Its intersection with SH82 was closed, and SH82 and SH83 were also closed. South of Oamaru, SH1 was closed at Maheno, open at Hampden, but closed at Palmerston and Cherry Farm. The detour through Kurow was closed about 7 pm because of flooding at Georgetown and Duntroon. Many local roads were also flooded. Rural school bus services in North Otago and Waimate were cancelled, and rural schools in North Otago were all closed. In Dunedin City, sports grounds and some roads were closed by minor flooding, and a large slip closed Highcliff Road on Otago Peninsula. The heavy rain also caused problems with sewage back-up. The Temuka River flooded in parts, with low lying areas and some roads on its southern side under water. At Ardmore Airport, Auckland, the heavy rain caused a drain to collapse, exposing an old ammunition dump, fortunately revealing only old shells and casings. In Napier, central city businesses were flooded, damaging stock in some cases.

On 26 May, the Avon River burst its banks causing minor flooding in Christchurch. Heavy rain resulted in a rock fall that blocked the entrance to Ngai Tahu Maori Rock Art site, near SH83 south of Duntroon, but fortunately did not damage the art.

On 28 May, residents in Aln Street, Oamaru were evacuated for one night after a landslide caused by saturated soil. Flooding also occurred in Henley on the Taieri Plains. The Danseys Pass Coach Inn manager and his young sons spent two days trapped in the Inn after heavy rain washed out part of the access road, and snow blocked the alpine route. A rough track past the washed-out section was cleared on 30 May.

On 29 May, heavy rain in Napier caused a large slip on Faraday Street, forcing the evacuation of seven residents, who were allowed home on the 30th after the road was re-opened. In other parts of Napier, surface flooding was up to a metre deep. Water schemes supplying several parts of Waitaki district were closed after contamination at their intakes. Affected areas included Palmerston, Awamoko, Dunback, Hampden/Moeraki, Herbert/Waianakarua, Lower Waitaki, Goodwood, and Kauru Hill. In north Otago, a landslide and other

slumps also occurred in Moeraki, but affected properties were unoccupied. In Dunedin, land movement resulting from the heavy rain burst a water main, cutting supplies to MacAndrew Bay and Company Bay for several hours.

On 30 May, a major slip north of MacAndrew Bay blocked Portobello Road on the Otago Peninsula between Castlewood Road and Broad Bay.

Heavy rainfall affected Whakatane on 1 June. SH2 between Opotiki and Whakatane was closed. More than 50 people were evacuated from their homes in Whakatane, and a rest home in Opotiki was also evacuated. Two people were rescued from a car stuck in floodwaters in Matata, and another group was rescued 3 km west of Matata. A sewer pipe ruptured in Ohope, prompting warnings about contamination around the outlet. In Mount Maunganui, some streets were under 30 cm of water, several properties were flooded, and a family trapped in their car by floodwaters on Ocean Beach Road. At Papamoa Beach, water up to 20 cm deep flooded homes. In Auckland properties were flooded in Mt Roskill, One Tree Hill, Epsom, Penrose, Shelly Park and the Southdown Industrial Park. The heavy rain caused a sewage main in Otahuhu to rupture, and 12 houses were evacuated. In Whitianga, homes were flooded, schools closed early, and local roads were closed by slips.

On 7 June, heavy rain caused a large slip on Paekakariki Hill Road, north of Wellington, blocking both lanes. In the city, a large slip in the suburb of Strathmore forced the evacuation of two houses. In the Manawatu Gorge (SH3) a large slip obstructed one lane at the Woodville end. A large slip blocked one lane of SH2, near Waioeka Gorge, for most of the day, and a slip blocked the southbound lane in Wharerata Gorge, south of Gisborne. Rocks the size of soccer balls were strewn over the Takaka Hill Road after a stormy Sunday night. Water up to 30 cm deep on SH1 near the Awatere Valley–Redwood Pass intersection caused delays, with cars being let through one at a time. Many roads in South Canterbury and North Otago, that had just reopened after earlier flooding, were closed again, as were parts of SH1 between Hilderthorpe and Pukeuri, just north of Oamaru. Surface flooding caused some road closures in Dunedin, on Otago Peninsula, and on the Taiari Plains.

On 25 June, flooding and slips closed SH25 between Coromandel and Kuaotunu, between Coromandel and Tapu, and between Whitianga and Coroglen. A slip caused by heavy rain affected SH5 between Taupo and Napier.

On 6 July heavy rain on the East Coast cut power to properties in the Gisborne area, affecting the Te Araroa, Waikura Valley and Mata Road areas. People in inland Ruatoria were isolated after the Mata River washed away their sole road access. SH2 between Napier and Wairoa was closed by extensive slips and flooding. SH35 was down to one lane near Te Araroa, and many rural roads were closed by slips and surface flooding. Wharekopae Road residents were cut off when Brunton Road was closed overnight, and many ford crossings in the area were impassable.

On 7 July, SH2 between Napier and Wairoa was closed by major slips at the Devil's Elbow and Waikouau Hill areas. SH2 was also underwater around Tutira and was closed overnight. Many rural roads in the Hastings and Havelock North areas were blocked by flooding and slips. The Napier-Taupo Road was reduced to one lane by a slip near Te Pohue. Travel to and from Rissington was affected by a slip which closed Puketitiri Road. SH2 was blocked during the morning by a fallen tree at Bartletts Hill. Power lines were downed, cutting electricity to Te Araroa, Waikura Valley and Mata Road areas. Some Ngatapa residents could not go home because their only access road was blocked.

On 23 and 24 July, heavy rain caused flooding and slips on SH1 between Blenheim and Waipara, and on SH7 between Springs Junction and Waipara. In southern Wairarapa flooding closed the Ponatahi Bridge near Martinborough, and White Rock Road at the intersection with Lagoon Hill Road.

On 4 August, a large landslide behind a house in the Wellington suburb of Karori made the house uninhabitable, forcing the residents to move out. Further north, a storm lashed Northland, closing schools at Rawene and Opononi, while flooded roads cut off Omanaia School from either side. Surface flooding was also reported on SH1 near Houhora, in Whangarei, Kaeo, Waikare, and the Kai Iwi Lakes area.

On 8 August, a large slip closed northbound lanes of SH2 between Wellington and the Hutt Valley for about four hours. In Canterbury, the heavy rain caused slips and flooding, closing two roads overnight on Banks Peninsula. A slip at Greta Valley reduced SH1 to one lane.

Heavy rain over the weekend of 14–15 August caused floods in the Bay of Plenty with a 10-metre breach in the Te Rahu Canal stop-bank off the Whakatane River. Several families were evacuated, and four schools and two pre-schools in Whakatane were closed. The Whakatane Boat Ramp was closed, phone lines were cut, and there was widespread surface flooding. Many roads around the region were closed, with Opotiki isolated. The Waioeka Gorge was closed by large slips, cutting off SH2 between Opotiki and Matawai, and surface flooding closed SH2 between Opotiki and Whakatane. On 15 August, a slip blocked both lanes of SH1 between Picton and Blenheim.

SH1, north of Oamaru, was affected by surface flooding on 30 August, after overnight rain. Grange Hill Road at Waihemo, North Otago, was closed by surface flooding, and other minor roads had caution notices in place.

On 6 September, heavy rain overnight caused flooding and some road closures in Hutt Valley. The rain also caused slips and surface flooding on SH56 and SH57 between Levin and Palmerston North, and at the SH1/Kimberley Road junction. Many rural roads in Manawatu, Wanganui and Horowhenua were closed by slips and flooding. In Otaki, the Waitohu Stream breached its banks, flooding one home, and threatening others. The Levin Water Treatment Plant had to be closed. Several small slips closed the Manawatu Gorge near Palmerston North. In northern Wairarapa, SH2 between Eketahuna and Pahiatua was closed by extensive flooding, with no alternative routes available as local roads were also flooded. Farmers in Shannon lost lambs in the flooding. The Ruamahunga River Bridge at Bidwell's Crossing in Martinborough was closed. Slips and floods closed SH3 south of Wanganui and SH43 in the King Country between Whangamomona and the Moki Tunnel. Falling trees blocked both lanes of SH1 near Bulls, and Calico Line, the link road from SH1 to Marton, 13 km north of Bulls, was closed.

On 7 September, heavy rain cut a swath through the Matahiia cemetery near Ruatoria, flushing four bodies into the Mata River.

On 18 September, several slips came down and trees fell over on SH43 from Stratford to Taumarunui causing the closure of the road to non-residents. On 19 September, SH41 at Waihi Hill, between Turangi and Kuratau, SH4 between Whanganui and Raetahi, SH3 at Ratana south of Whanganui, and SH1 between Taihape and Mangaweka, were closed by slips. The SH1 underpass at Calico Line filled up with water, and two cars had to be towed out. In Wanganui, residents were advised to leave, after a slip from Bastia Hill threatened their homes. At Turakina Beach, where natural topography directs the run-off into the village, an old drain running around the back of the village was re-opened to help ease the flood waters. Three properties were evacuated. Houses in Marton were also evacuated because of flooding.

On 22 September, a 25 m landslip closed SH2 between Woodville and Dannevirke. SH43 from Stratford to Taumarunui remained closed. Slips on the Manawatu Gorge and debris on SH4 between Wanganui and Raetihi also caused traffic problems. Surface flooding affected SH1, south of Levin. The only road to Taumarunui Hospital was blocked for more than an hour as a slip covered the road. On 23 September, large slips reduced SH1 to one lane between Taihape and Utiku, and at Iirangi south of Waiouru. On 25 September, a large slip blocked the railway line through the Manawatu Gorge, derailing a freight train.

On 30 September, many minor roads in the Nelson area were closed after continuous heavy rain. In Cable Bay, northeast of Nelson, a farmer could only watch as floodwaters rose and swept away a flock of ewes and lambs. They had been shifted to higher ground but had returned. In the Wellington region, Grays Road, the Paekakariki Hill Road and Takarau Gorge Road in Ohariu were closed by slips and flooding, and surface flooding was also reported on SH1 near Lindale. A slip on SH1 south of Tawa reduced the road to one lane, and slips also caused delays on SH2 near Petone and Normandale, and SH58 near Whitby in Porirua. A slip near Whenua Tapu Cemetery, between Plimmerton and Pukerua Bay, blocked a southbound lane of SH1. A passenger train heading north to Paraparaumu hit a slip north of Plimmerton, causing it to derail and pushing it sideways. A south-bound train then collided with the cab of the derailed train. Both trains were badly damaged, but there were no serious injuries. Another slip closed the Johnsonville line, and tracks subsided near Muri, in Pukerua Bay, with a 15 m slip causing the earth to fall away from beneath the tracks. The

Karori Tunnel was also closed for an hour by a slip. In Melrose, Wellington, a retaining wall collapsed on to a house, forcing the family out of the building, and properties in Khandallah were undermined by a slip. In the Aro Valley, a slip brought down a power pole when a section of footpath fell away. Many homes on the Kapiti Coast were flooded.

On 13 October, heavy rain caused slips and flooding, closing SH2 between Napier and Wairoa, SH35 north of Tolaga Bay, and many minor roads in the area. Dozens of homes were left without power, rural schools were closed, and many families were evacuated from Tolaga Bay.

On 14 October, a series of slips overnight, from the Matahorua Gorge to Tangoio, just north of Napier, made SH2 impassable. About 20 cars were trapped overnight between two slips. North of Gisborne, flooding reduced SH2 to one lane north of Te Karaka, and SH35 to one lane between Gisborne and Ruatoria. Firefighters had to pump out flooded marquees at the Gisborne showgrounds before the annual A&P show. In Napier, flooding was reported at the Eastern Institute of Technology campus. Wairoa airfield was closed. In northern Wairarapa, a huge slip blocked the road from Pahiatua to Makuri and Pongoroa. On 15 October, more than 20 motorists, some towing horses, were trapped between a slip at Otoko Hill and a washed-out bridge on SH2. In Hawke's Bay, Eskdale residents were isolated by flood waters.

On 27–28 December, heavy rain caused flooding in the West Coast, Nelson and Marlborough. Several South Island roads were closed by surface flooding, including SH60 at Takaka, cutting off much of Golden Bay, SH6 at Renwick and at Canvastown (between Blenheim and Nelson), SH6 at the Lower Buller Gorge, SH63 between Arthurs Pass and Otira, SH73 between Otira and Kumara, SH69 from Inangahua to Reefton, SH65 from Murchison to Springs Junction, SH67 from Westport to Mokihinui, and SH7 from Hanmer Springs to Springs Junction. The James Road bridge in Bainham was washed away. Bainham is on the Aorere River, 120 km (75 miles) from Nelson. A bridge in the Glen Roy Valley, near Murchison, was washed out. Significant stock losses occurred in several areas.

Table 9: 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
January				
Matamata	85	31st	1951	Highest
Tauranga	120	31st	1910	2nd-highest
Whatawhata	61	31st	1952	3rd-highest
Hamilton	78	31st	1935	3rd-highest
Masterton	84	22nd	1926	Highest
Castlepoint	160	22nd	1907	Highest
Gisborne	58	30th	1937	4th-highest
Waipawa	66	22nd	1945	3rd-highest
Wairoa, North Clyde	83	31st	1967	2nd-highest
Lumsden	53	21st	1982	2nd-highest
Cromwell	48	21st	1949	2nd-highest
Alexandra	39	21st	1983	2nd-highest
Matamata	85	31st	1951	Highest
Tauranga	120	31st	1910	2nd-highest
Whatawhata	61	31st	1952	3rd-highest
Hamilton	78	31st	1935	3rd-highest
Masterton	84	22nd	1926	Highest
Castlepoint	160	22nd	1907	Highest
Gisborne	58	30th	1937	4th-highest
April				
Milford Sound	314	25th	1929	2nd-highest
Manapouri	79	25th	1963	Highest
Queenstown	62	25th	1890	Highest
Lumsden	52	25th	1982	Highest
Gore	40	25th	1967	2nd-highest
May				
Leigh	80	20th	1967	3rd-highest
Warkworth	96	20th	1967	3rd-highest

Whangaparaoa	81	20th	1946	2nd-highest
Kumeu	66	20th	1978	2nd-highest
Whitianga	109	20th	1961	2nd-highest
Whakatane	153	24th	1952	Highest
Rotorua	113	24th	1964	3rd-highest
Takapau Plains	71	24th	1962	2nd-highest
Dannevirke	50	24th	1951	4th-highest
Castlepoint	95	24th	1907	3rd-highest
Waipawa	75	24th	1945	Highest
Hanmer Forest	105	25th	1905	3rd-highest
Winchmore	61	25th	1927	3rd-highest
Darfield	73	25th	1919	3rd-highest
Woodbury	108	27th	1973	Highest
Orari Estate	73	25th	1897	4th-highest
Timaru	54	25th	1881	4th-highest
Oamaru	71	24th	1898	3rd-highest
Dunedin (Airport)	79	28th	1918	Highest
Balclutha	40	25th	1964	3rd-highest
June				
Whakatane	170	1st	1952	Highest
Blenheim	71	6th	1927	2nd-highest
Ranfurly	25	6th	1943	4th-highest
Lumsden	24	22nd	1982	2nd-highest
Cromwell	30	6th	1949	2nd-highest
Alexandra	27	6th	1983	Highest
July				
Kumeu	50	21st	1978	4th-highest
Hokitika	76	31st	1963	4th-highest
Okarito	123	31st	1981	2nd-highest
Manapouri	42	31st	1963	3rd-highest
August				
Wanganui	30	4th	1987	3rd-highest
Takaka	91	12th	1976	2nd-highest
Woodbury	58	7th	1973	3rd-highest
Alexandra	17	13th	1983	2nd-highest
September				
Te Puke	66	9th	1973	3rd-highest
Paraparaumu	72	30th	1951	Highest
Levin	51	30th	1949	Equal highest
Wallaceville	56	30th	1939	3rd-highest
Hawera	37	30th	1977	Equal 4th-highest
Waiouru	37	18th	1950	4th-highest
Wanganui	39	6th	1937	Highest
Takaka	118	29th	1976	2nd-highest
Blenheim	47	29th	1927	Equal 4th-highest
Alexandra	16	6th	1983	2nd-highest
October				
Gisborne	111	13th	1937	2nd-highest
Patutahi	151	13th	1890*	Highest
Napier	86	13th	1870	4th-highest
Waipawa	48	13th	1945	4th-highest
Wairoa	99	13th	1967	2nd-highest
December				
Dargaville	109	17th	1943	Highest
Whangaparaoa	46	19th	1946	4th-highest
Stratford	95	27th	1960	3rd-highest
Takaka	171	27th	1976	Highest
Arthurs Pass	252	27th	1906	3rd-highest
Mt Cook	313	27th	1928	4th-highest
Lake Tekapo	60	27th	1925	2nd-highest
Tara Hills	85	27th	1949	Highest
Wanaka	51	27th	1927	3rd-highest
Ranfurly	46	27th	1943	2nd-highest
Dunedin Airport (Taieri)	52	27th	1962	Highest
Dunedin	58	27th	1918	2nd-highest
Queenstown	63	27th	1890	4th-highest
Lumsden	40	27th	1982	4th-highest
Cromwell	41	27th	1949	3rd-highest

Alexandra	43	27th	1983	Highest
Invercargill	44	27th	1939	3rd-highest
Balclutha, Telford	49	27th	1964	Highest
Nugget Point	48	27th	1930	2nd-highest

Table 10: Near-record or record high monthly rainfalls were recorded at:

Location	Rainfall (mm)	Percentage of normal for the month	Year Records began	Comments
January				
Matamata	138	179	1951	2nd-highest
Hamilton	192	239	1935	2nd-highest
Takapau Plains	189	273	1962	3rd-highest
Castlepoint	321	601	1902	Highest
Gisborne	171	307	1905	3rd-highest
Napier	195	365	1870	4th-highest
Waipawa	188	497	1945	3rd-highest
Wairoa, North Clyde	281	292	1964	2nd-highest
Ohakune	198	191	1961	Highest
Lumsden	140	136	1982	2nd-highest
April				
Milford Sound	1424	240	1929	Highest
Manapouri	271	316	1961	Highest
Lumsden	141	198	1982	2nd-highest
Alexandra	47	168	1983	4th-highest
Gore	150	199	1950	4th-highest
Milford Sound	1424	240	1929	Highest
May				
Kerikeri	268	213	1981	2nd-highest
Leigh	245	286	1966	3rd-highest
Whangaparaoa	233	305	1946	Highest
Kumeu	219	212	1978	Highest
Whitianga	458	369	1961	Highest
Te Puke	311	274	1973	2nd-highest
Whakatane	294	373	1952	3rd-highest
Rotorua	285	261	1963	4th-highest
Takapau Plains	194	215	1962	2nd-highest
Waipawa	167	256	1945	3rd-highest
Wanganui	116	143	1987	2nd-highest
Blenheim	191	319	1927	Highest
Hanmer Forest	296	299	1905	3rd-highest
Winchmore	218	370	1909	3rd-highest
Darfield	190	322	1919	3rd-highest
Lake Tekapo	134	268	1925	4th-highest
Orari Estate	204	376	1897	2nd-highest
Timaru	150	341	1881	Highest
Oamaru	203	411	1898	Highest
Dunedin (Airport)	243	406	1918	Highest
Cromwell	72	192	1949	3rd-highest
Kerikeri	268	213	1981	2nd-highest
Leigh	245	286	1966	3rd-highest
Whangaparaoa	233	305	1946	Highest
Kumeu	219	212	1978	Highest
Whitianga	458	369	1961	Highest
Te Puke	311	274	1973	2nd-highest
Whakatane	294	373	1952	3rd-highest
Rotorua	285	261	1963	4th-highest
Takapau Plains	194	215	1962	2nd-highest
June				
Kumeu	181	132	1978	4th-highest
Te Puke	283	161	1973	2nd-highest
Whakatane	321	254	1952	Highest
Taupo	184	188	1949	3rd-highest
Whatawhata	349	210	1952	2nd-highest
Hamilton (Ruakura)	232	192	1905	4th-highest
Turangi	277	190	1968	2nd-highest

Hawera	165	141	1977	4th-highest
Nelson	155	183	1941	4th-highest
Blenheim	196	288	1927	Highest
July				
Wairoa	202	159	1964	2nd-highest
August				
Kaitaia	249	173	1967	3rd-highest
Kerikeri	270	145	1981	3rd-highest
Whitianga	374	212	1961	3rd-highest
Tauranga	274	236	1898	Highest
Te Puke	413	262	1973	Highest
Whakatane	252	225	1952	2nd-highest
Rotorua	290	203	1963	3rd-highest
Taupo	173	155	1949	3rd-highest
Hamilton	196	169	1935	4th-highest
Turangi	269	176	1968	Highest
Hawera	146	145	1977	3rd-highest
Wanganui	155	223	1987	Highest
Takaka	362	181	1976	2nd-highest
Ranfurlly	53	185	1943	4th-highest
Alexandra	36	142	1983	4th-highest
September				
Whitianga	286	172	1961	4th-highest
Matamata	197	192	1951	3rd-highest
Te Puke	225	165	1973	2nd-highest
Whatawhata	291	198	1952	2nd-highest
Hamilton	181	168	1935	4th-highest
Te Kuiti	296	199	1950	Highest
Taumarunui	345	236	1913	Highest
Turangi	370	257	1968	Highest
Takapau Plains	170	188	1962	3rd-highest
Dannevirke	234	265	1951	2nd-highest
Paraparaumu	241	288	1945	Highest
Palmerston North	261	328	1928	Highest
Levin	189	207	1895	3rd-highest
Wallaceville	236	211	1924	2nd-highest
Stratford	338	197	1960	4th-highest
Hawera	212	230	1977	Highest
Ohakune	361	269	1961	Highest
Waiouru	280	285	1950	Highest
Wanganui	197	275	1890	Highest
Takaka	329	187	1976	2nd-highest
Westport	316	162	1944	4th-highest
Lake Rotoiti	349	248	1933	Highest
Hokitika	442	177	1963	3rd-highest
Reefton	352	198	1960	4th-highest
Greymouth	365	176	1947	3rd-highest
Blenheim	141	219	1927	2nd-highest
Lumsden	78	121	1982	3rd-highest
Alexandra	41	199	1983	3rd-highest
Invercargill	192	250	1939	Highest
Balclutha	93	193	1964	2nd-highest
October				
Gisborne	199	349	1905	4th-highest
Wairoa	234	262	1964	3rd-highest
December				
Dargaville	193	239	1943	2nd-highest
Stratford	298	199	1960	Highest
Takaka	494	365	1976	Highest
Motueka, Riwaka	242	244	1943	2nd-highest
Nelson	193	255	1941	Highest
Appleby	180	243	1941	3rd-highest
Blenheim	126	227	1927	3rd-highest
Arthurs Pass	957	206	1906	4th-highest
Mt Cook	1122	239	1928	3rd-highest
Lake Tekapo	119	246	1925	4th-highest
Alexandra	74	167	1983	4th-highest

Section 14: Low soil moisture levels and record low monthly rainfall

Drought was declared in Northland in January 2010, after a three-month period of extremely low rainfall in the region. Severe soil moisture deficits (more than 130 mm of deficit) continued in Northland during February, and developed in parts of Auckland, Marlborough, Canterbury and Otago during March as the dryness continued. At the end of March, significant soil moisture deficits (more than 110 mm of deficit) had also developed in Waikato, Bay of Plenty, Coromandel, Taupo and parts of Gisborne and Hawke's Bay. Drought was declared for Auckland, Waikato, Bay of Plenty, South Taranaki, South Canterbury and Otago in April. Even after some helpful rainfall at the end of April, significant soil moisture deficits remained in many areas of the North Island (except for Taranaki, Gisborne, and the Kapiti Coast), as well as in Marlborough and Canterbury.

The drought finally broke in May. But by the end of October, unusually large soil moisture deficits had again developed in much of Northland, coastal Nelson, mid Canterbury, and North Otago. After the extremely low rainfall experienced in November, severe soil moisture deficits were in evidence by the end of the month in Northland, Auckland, parts of the Waikato, Nelson, the Lakes District and central Otago, with significant soil moisture deficits (more than 110 mm of deficit) elsewhere in the Waikato, Taupo, parts of the Manawatu and Gisborne, in Hawke's Bay and the Wairarapa, Marlborough, and parts of Canterbury. Drought was again declared in Northland, Waikato and the Ruapehu district in December.

Table 11: Near-record or record low monthly rainfalls were recorded at:

Location	Rainfall (mm)	Percentage of normal	Year records began	Comments
January				
Oamaru	18	35	1898	4th-lowest
February				
Kaitia	23	30	1985	4th-lowest
Kumeu	11	15	1978	2nd-lowest
Tauranga	10	14	1898	2nd-lowest
Auckland (Airport)	5	7	1959	Lowest
Pukekohe	12	15	1944	3rd-lowest
Culverden	4	11	1921	2nd-lowest
Tara Hills	6	16	1949	4th-lowest
Lumsden	47	62	1982	4th-lowest
March				
Whangarei	8	6	1937	2nd-lowest
Warkworth	12	11	1966	Lowest
Whangaparaoa	7	9	1946	2nd-lowest
Whitianga	23	14	1961	3rd-lowest
Paeroa	13	12	1914	2nd-lowest
Matamata	19	21	1951	2nd-lowest
Tauranga	17	13	1898	4th-lowest
Te Puke	19	12	1973	2nd-lowest
Whakatane	29	27	1952	3rd-lowest
Rotorua	23	21	1963	3rd-lowest
Auckland (Airport)	8	9	1959	Lowest
Pukekohe	14	14	1944	Lowest
Hamilton (Ruakura)	15	17	1905	4th-lowest
Te Kuiti	20	19	1950	2nd-lowest
Turangi	15	12	1968	2nd-lowest
Waipawa	6	8	1945	Lowest
Hawera	28	30	1977	3rd-lowest
Takaka	43	29	1976	4th-lowest
Whangarei	8	6	1937	2nd-lowest
April				
Warkworth	30	27	1966	3rd-lowest

Whangaparaoa	15	18	1946	2nd-lowest
Kumeu	44	40	1978	2nd-lowest
Whitianga	45	30	1961	4th-lowest
Masterton	14	21	1926	Lowest
Takapau Plains	27	31	1962	Equal 3rd-lowest
Dannevirke	23	26	1951	2nd-lowest
Martinborough	11	19	1924	3rd-lowest
Wellington (Airport)	27	33	1958	4th-lowest
Ohakune	43	41	1961	4th-lowest
Waiouru	30	35	1950	3rd-lowest
Wanganui	31	44	1987	2nd-lowest
Blenheim	5	8	1927	2nd-lowest
Hanmer Forest	18	20	1905	3rd-lowest
Kaikoura	10	14	1898	4th-lowest
Culverden	4	8	1921	Equal lowest
May				
Reefton	62	32	1960	4th-lowest
Lumsden	59	64	1982	4th-lowest
Tiwai Point	44	39	1970	Lowest
June				
Kaitaia	95	66	1985	4th-lowest
July				
Te Puke	68	39	1973	3rd-lowest
Rotorua	37	26	1963	2nd-lowest
Taupo	20	20	1949	Lowest
Turangi	59	36	1968	4th-lowest
Paraparaumu	39	39	1945	4th-lowest
Stratford	50	24	1960	2nd-lowest
Hawera	48	37	1977	4th-lowest
Ohakune	49	33	1961	4th-lowest
Wanganui	22	25	1987	3rd-lowest
Lake Rotoiti	30	23	1933	3rd-lowest
Lumsden	20	29	1982	2nd-lowest
Balclutha	15	28	1964	4th-lowest
Te Puke	68	39	1973	3rd-lowest
Rotorua	37	26	1963	2nd-lowest
Taupo	20	20	1949	Lowest
Turangi	59	36	1968	4th-lowest
Paraparaumu	39	39	1945	4th-lowest
Stratford	50	24	1960	2nd-lowest
Hawera	48	37	1977	4th-lowest
October				
Kaitaia	26	28	1967	2nd-lowest
Kerikeri	50	37	1981	3rd-lowest
Dargaville	22	26	1943	2nd-lowest
Leigh	36	42	1966	4th-lowest
Kumeu	23	23	1978	Lowest
Te Puke	36	25	1973	3rd-lowest
Rotorua	49	43	1963	4th-lowest
Auckland	20	24	1959	2nd-lowest
Whatawhata	55	40	1952	4th-lowest
Hamilton	31	33	1905	4th-lowest
Te Kuiti	33	23	1950	2nd-lowest
Taumarunui	41	28	1913	3rd-lowest
Turangi	32	22	1968	2nd-lowest
New Plymouth	36	27	1944	2nd-lowest
Levin	28	30	1895	2nd-lowest
Stratford	69	32	1960	2nd-lowest
Hawera	46	41	1977	3rd-lowest
Hokitika	144	50	1963	4th-lowest
Nelson	7	7	1941	Lowest
Appleby	10	11	1941	2nd-lowest
November				
Kaitaia	31	31	1985	3rd-lowest

Kerikeri	24	18	1981	3rd-lowest
Dargaville	10	14	1943	Lowest
Whangarei	14	16	1937	2nd-lowest
Leigh	27	36	1966	4th-lowest
Warkworth	25	26	1966	2nd-lowest
Whangaparaoa	20	31	1946	3rd-lowest
Kumeu	37	42	1978	4th-lowest
Matamata	33	36	1951	3rd-lowest
Taupo	16	19	1949	Lowest
Auckland	22	28	1959	3rd-lowest
Whatawhata	24	18	1952	Lowest
Hamilton	16	17	1935	Lowest
Te Kuiti	17	13	1950	Lowest
Turangi	30	21	1968	2nd-lowest
New Plymouth	27	24	1944	Lowest
Dannevirke	20	22	1951	Lowest
Wairoa	18	23	1964	2nd-lowest
Paraparaumu	19	24	1945	3rd-lowest
Wellington	21	27	1958	4th-lowest
Wallaceville	29	28	1924	4th-lowest
Stratford	22	14	1960	Lowest
Ohakune	40	34	1961	Lowest
Waiouru	35	45	1950	3rd-lowest
Wanganui	9	12	1890	Lowest
Takaka	9	5	1976	Lowest
Westport	42	24	1944	3rd-lowest
Lake Rotoiti	32	23	1933	2nd-lowest
Hokitika	88	37	1963	4th-lowest
Reefton	17	10	1960	Lowest
Greymouth	54	27	1947	2nd-lowest
Motueka	18	17	1943	4th-lowest
Appleby	13	16	1941	4th-lowest
Arthurs Pass	70	15	1906	2nd-lowest
Mt Cook	49	13	1928	3rd-lowest
Wanaka	3	5	1927	Lowest
Manapouri	2	3	1961	Lowest
Kaitaia	31	31	1985	3rd-lowest
Kerikeri	24	18	1981	3rd-lowest
Dargaville	10	14	1943	Lowest
Whangarei	14	16	1937	2nd-lowest
Leigh	27	36	1966	4th-lowest
Warkworth	25	26	1966	2nd-lowest
Whangaparaoa	20	31	1946	3rd-lowest
Kumeu	37	42	1978	4th-lowest
Matamata	33	36	1951	3rd-lowest
Taupo	16	19	1949	Lowest
December				
Wairoa, North Clyde	19	19	1964	3rd-lowest

Section 15: Sunshine extremes

In 2010, 6 months were particularly sunny in various locations (February, March, April, July, October, November), and 4 months (January, May, August, September) were very cloudy.

Table 12: High monthly sunshine extremes were recorded at:

Location	Sunshine (hours)	Percentage of normal	Year Records began	Comments
January				
Kaitaia	277	121	1985	4th-highest
February				
Kaitaia	248	126	1985	2nd-highest
Greymouth	225	131	1947	4th-highest
Cheviot	220	114	1983	3rd-highest
Mt Cook	213	126	1930	2nd-highest
Dunedin	245	158	1947	Highest
Cromwell	269	126	1979	3rd-highest
Invercargill	204	124	1932	3rd-highest
Balclutha	269	166	1964	Highest
March				
Turangi	236	136	1976	2nd-highest
Martinborough	242	129	1986	Highest
Waipawa	229	137	1945	3rd-highest
Wellington, Kelburn	245	128	1928	4th-highest
Stratford	231	131	1963	2nd-highest
Blenheim	262	122	1947	2nd-highest
April				
Dannevirke	192	137	1963	2nd-highest
Martinborough	203	134	1986	Highest
Gisborne	227	146	1905	2nd-highest
Waipawa	222	151	1945	2nd-highest
June				
Dargaville	143	158	1943	2nd-highest
Mt Cook	96	141	1930	4th-highest
Balclutha	117	145	1964	3rd-highest
July				
Kaitaia	176	124	1985	Highest
Dargaville	151	137	1943	2nd-highest
Hamilton	163	131	1936	2nd-highest
Te Kuiti	155	150	1962	2nd-highest
Turangi	164	141	1976	Highest
New Plymouth	171	129	1972	4th-highest
Greymouth	157	152	1947	3rd-highest
Lake Tekapo	172	162	1928	2nd-highest
Dunedin	139	138	1947	4th-highest
Cromwell	136	144	1979	Equal highest
Invercargill	128	141	1932	2nd-highest
Balclutha	146	152	1964	Highest
October				
Kaitaia	244	134	1985	Highest
Dargaville	204	123	1943	3rd-highest
Hamilton	222	129	1936	2nd-highest
Te Kuiti	248	171	1962	Highest
Taumarunui	229	157	1947	Highest
Turangi	227	132	1976	2nd-highest
New Plymouth	247	129	1972	3rd-highest
Paraparaumu	234	131	1953	3rd-highest
Takaka	284	141	1985	Highest
Nelson	296	139	1948	Highest
Appleby	287	135	1948	2nd-highest
Mt Cook	196	137	1930	3rd-highest
Christchurch	245	123	1930	3rd-highest
Lake Tekapo	272	138	1928	2nd-highest
Timaru	240	136	1930	Highest

Dunedin	235	156	1947	Highest
Cromwell	260	126	1979	4th-highest
Balclutha	268	170	1964	Highest
November				
Kaitaia	228	120	1985	2nd-highest
Te Kuiti	239	149	1962	Highest
Taumarunui	272	165	1947	Highest
Turangi	263	142	1976	Highest
New Plymouth	275	135	1972	Highest
Dannevirke	237	134	1963	2nd-highest
Martinborough	250	129	1986	3rd-highest
Paraparaumu	254	128	1953	4th-highest
Stratford	255	131	1963	2nd-highest
Blenheim	284	123	1947	3rd-highest

Table 13: Low monthly sunshine extremes were recorded at:

Location	Sunshine (hours)	Percentage of normal	Year Records began	Comments
January				
Martinborough	173	75	1986	Lowest
Wallaceville	164	72	1939	3rd-lowest
Stratford	172	76	1963	3rd-lowest
Blenheim	221	85	1947	3rd-lowest
Cheviot	181	76	1983	2nd-lowest
Lake Tekapo	193	77	1928	4th-lowest
Cromwell	214	89	1979	3rd-lowest
April				
Hokitika	101	71	1964	3rd-lowest
May				
Martinborough	95	71	1986	2 nd -lowest
Takaka	127	78	1985	Lowest
Blenheim	119	69	1947	Lowest
June				
Martinborough	77	81	1986	3rd-lowest
Blenheim	118	81	1947	Lowest
August				
Kaitaia	122	78	1985	2nd-lowest
Dargaville	112	84	1943	2nd-lowest
Turangi	92	68	1976	Lowest
New Plymouth	121	79	1972	3rd-lowest
Martinborough	89	60	1986	Lowest
Wallaceville	87	71	1939	4th-lowest
Stratford	90	69	1963	3rd-lowest
Blenheim	156	86	1947	3rd-lowest
Christchurch	87	59	1930	2nd-lowest
September				
Turangi	92	68	1976	Lowest
New Plymouth	121	76	1972	2nd-lowest
Hokitika	100	70	1964	3rd-lowest
Mt Cook	65	53	1930	2nd-lowest
December				
Kaitaia	151	69	1985	3rd-lowest
Hamilton, Ruakura	159	75	1936	4th-lowest
New Plymouth	168	73	1972	2nd-lowest
Stratford	150	72	1963	4th-lowest

Section 16: Snowfall

On 8 June, snow closed the Desert Road, the Lindis Pass, and SH1 from Hildethorpe to Oamaru. In Christchurch, snow settled above 300 m on the Port Hills, with small hail at lower levels in some city suburbs. Snow was also reported in the Wellington hill suburb of Newlands, with sleet and hail elsewhere over the city. SH2 over the Rimutaka Hill was closed by snow for a short time.

Snow overnight and in the morning of 23 June closed schools in the Queenstown and Te Anau areas, and affected many roads. The Crown Range between Arrowtown and Wanaka, and SH8, between Omarama and Tarras, (the Lindis Pass), and between Fairlie and Twizel (Burkes Pass) were closed, and chains were required on SH65 near Springs Junction, SH80 near Mount Cook, SH6 between Queenstown and Lumsden, SH94 between Te Anau and Milford Sound, the Lewis Pass, Porters Pass, and Arthurs Pass. Queenstown Airport was closed all morning because of snow on the runway.

On 8 August, snow fell in inland Canterbury, with chains required for all vehicles driving over the high passes. Lindis Pass re-opened about mid-day after being closed overnight. The snow and accompanying winds disrupted several domestic and international flights at Queenstown Airport. In South Canterbury heavy snow brought down power lines in the Burkes Pass area, cutting power all day.

On 9 August, SH1 between Waiouru and Rangipo was closed by snow and ice. Heavy snow in Dunedin's hill suburbs created difficulties for people trying to reach the city.

On 15 September, the Milford Road was closed by snow between Milford Village and the Hollyford turnoff.

On 17 September, snow closed the Lindis Pass, Haast Pass, and SH73 from Arthurs Pass to Otira to towing vehicles. SH94 to Milford Sound remained closed.

On 18 September heavy snow caused the roof to collapse on Stadium Southland in Invercargill. The stadium was demolished. After a paint shop roof also collapsed, the central Invercargill street was cordoned off because of concerns the building's windows would explode on to the street. Several other commercial properties all had sagging roofs and were closed. In Tweed Street an 18 year-old, 1000 m² glasshouse was destroyed by the snow. Fonterra was unable to collect milk from more than 400 dairy farmers in Edendale, Winton, and Eastern Southland because of the dangerous roads, and some farmers were asked to dump milk. Thousands of lambs were lost, with those born during the weekend storm having little chance of survival. Some farmers reported lambing losses of up to 80 per cent. Invercargill airport was closed by snow all day, and in very poor visibility, an air bridge clipped the wing of an Air New Zealand plane, which had stopped slightly short of its normal position. Snow also closed SH93 between Maitua and Clinton, SH94 from Te Anau to Milford Sound, and the Southern Scenic Route between Owaka and Niagara.

On 19 September, snow closed SH93 from Clinton to Maitua, SH87 between Outram and Middlemarch, and the Chaslands Highway through the Catlins. SH94 from Te Anau to Milford Sound remained closed.

On 20 September, SH7, the Lewis Pass, and SH73, Arthur's Pass to Otira, were closed to towing vehicles. Road warnings remained in place on SH99 between Lorneville and Clifden, SH1 between Invercargill and Bluff, and Edendale and Invercargill, on SH6 from Winton to Invercargill, and from Athol to Lowther, SH94 from Gore to Mandeville, and SH98 from Lorneville to Dacre. Some schools in Tokanui and Invercargill remained closed while structural checks were made.

On 22 September, snow closed the Rimutaka Road between Wellington and Wairarapa for part of the morning. Drivers had lengthy delays. Pembroke Road on Mt Taranaki was closed by snow about 4 km from the Mountain House. Snow also closed SH97 between Mossburn and Lowther, SH6 between Kingston and Five Rivers, and SH93 between Maitua and Clinton. SH94 between Te Anau and Milford Sound was closed to towing vehicles. The Remarkables ski field was also closed.

On 23 September, snow closed SH7 from the Hanmer turnoff to Springs Junction, SH87 from Outram to Kyeburn, SH1 from Waitati to Dunedin, and SH93 from Clinton to Maitua. SH85 from Palmerston to Kyeburn was closed by ice. Snow created an avalanche hazard on SH94 from Te Anau to Milford Sound,

closing the road for two days. Snow closed SH73 from Arthurs Pass to Otira to towing vehicles, and chains were essential for all vehicles.

On 11 October, snow closed the Desert Road section of SH1 between Rangipo and Waiouru. Snow was also reported on the Mamaku Ranges near Rotorua, on Mount Pirongia near Te Awamutu, and to low levels on Mount Taranaki. On 11 October, the planned Ranfurly Shield parade through Christchurch was cancelled as it was too cold.

Section 17: Severe or damaging hail, electrical storms and tornadoes

On 14 May, small tornadoes were reported between Oakura and New Plymouth. Power was cut to the Oakura area, some properties suffered structural damage, and shelter belts were flattened. On 15 May, lightning in the Bay of Plenty split a tree into four sections in Te Puke, and activated alarms in Tauranga. In Auckland a violent thunderstorm caused surface flooding, blew down trees, uplifted roofing tiles, and also generated a tornado.

On 17 May, MetService reported 118 lightning strikes between 4.14 pm and 7.50 pm in the Whangarei area.

On 18 May, a tornado was reported above Rotorua airport.

A localised twister hit Hairini, just outside Tauranga, on 4 August, sending a shed roof flying across SH29.

A fierce hailstorm on 29 August affected the Bay of Plenty, with particularly heavy falls in Tauranga. In Papamoa, lightning struck a home, blasting a hole through the roof, blowing off tiles, and damaging the home's wiring. Otumoetai College closed for the day as it had no power or hot water as a result of a blown power transformer. Other parts of the northern and western parts of the North Island experienced electrical storms, with thunder heard in Taranaki, Matamata, Auckland and Northland.

On 3 September, an electrical storm struck Wellington, with thunder, lightning, and hail. The hail was still banked up in places the following morning.

On 14 September, a tornado swept across two farms near Oaonui (Taranaki), destroying fences and a hay barn on one property, and downing trees and ripping the roof of the cowshed at the other. Debris was scattered up to 500 m.

On 17 September, there were heavy hail storms on the West Coast, with warnings in place for drivers on SH6 between Franz Josef and Fox Glacier. In Wellington, an electrical storm struck about mid-day, causing power outages to thousands of lower North Island residents, and setting alight a shed in Lower Hutt and trees in Wairarapa.

On 19 September, lightning struck cottages at Nga Tawa school, Marton. In the Waikato, lightning strikes damaged transformers and related equipment, causing power cuts.

On 11 October, a heavy hail storm hit Tariki, and power was lost for a few hours at Te Kiri, near Opunake. Hail also affected Wellington City in the early morning.

On 18 October, hail fell on Canterbury from Rakaia Gorge to Pegasus Bay.

Section 18: High winds

Gales hit the lower South Island on 1 January, damaging trees in Invercargill. In South Canterbury, SH 8 between Lakes Pukaki and Tekapo was closed at about 6pm to motorcycles and high-sided vehicles. In Wanaka, a power line was brought down by the gale, disrupting power supplies.

On 3 January, winds created havoc during the annual New Year Regatta in Napier, with one girl concussed, and another fished out of the water after boats collided. About half of the 120 boats, competing in 12 classes, withdrew from the regatta. Strong winds were also recorded in Wellington.

On 31 January, gale force winds battered Taranaki, bringing down power lines and trees. The electricity supply was cut to parts of New Plymouth city, Bell Block, and Patea. SH45 near Lucy's Gully, and SH3, just south of Egmont Village, were partially blocked by fallen trees. Some flights in and out of New Plymouth airport were cancelled.

On 12 March a southerly storm moved up the east coast, with gale force winds in Wellington and Kaikoura. Trees fell across rail lines, blocking the Hutt Valley line north of Waterloo station, and damaging the overhead power and signalling. Fallen trees also blocked Paekakariki Hill Road. Trains and flights in and out of Wellington were disrupted, and a tug was used to manoeuvre the Cook Strait ferries in Wellington harbour. Power lines were blown down from Island Bay to Upper Hutt, and across to Paekakariki. Falling trees injured people in Carterton, and Rarangi (near Blenheim). The course was shortened in an annual fundraising sailing race by the Royal Port Nicholson Yacht Club. Of the 13 keel boats taking part, three needed to be towed to shore, and three had to wait out the storm. One person fell overboard but was quickly rescued. Roofs were blown off buildings in Wellington. Further south, Stewart Island Flights had to put on three extra flights, because all ferry sailings from Bluff to Oban were cancelled.

On 22 March, severe gales disrupted flights in and out of Wellington Airport, and brought down trees and phone lines. Two Cook Strait ferry sailings were cancelled, and the Eastbourne ferry service between Queens Wharf and Days Bay was also cancelled. At the Basin Reserve, during the cricket test match against Australia, the wind was strong enough to blow a pitch roller (along with several workers) along the ground, when they attempted to remove a pitch cover.

On 24 March, gale force winds and heavy rain battered Wellington, delaying flights and damaging windows, roofs and power lines. A tornado was reported at Rutherglen, near Greymouth, felling trees and damaging property.

Gales on 13 May damaged property, downed trees and caused power outages in Westport, Greymouth, Hokitika and Kumara. In Blaketown, a shed was dumped on a house roof, and in Cobden, a trampoline was blown over two houses and on to power lines. In South Westland, the quarterly Whataroa court sitting was cancelled, and Whataroa, Ross, and Kokatahi-Kowhitirangi schools were closed because of the power cuts. The Hokitika Aero Club lost its roof, a plane parked on the tarmac was spun around in the wind, and nearby property was damaged.

Gales on 4–5 July caused fallen trees and power lines in Northland, Auckland and Waikato, cutting power to thousands of properties, particularly in North Shore, West Auckland and Rodney. In Whangarei, a New Zealand Historic Places Trust-listed house lost its veranda, roof and a brick chimney to the gales.

On 12 August, the access to Mt Hutt ski field was closed because of high winds. About 1,000 people were forced to spend the night in the cafes.

On 5 September, an ambulance with three people inside was blown over south of Featherston, and a truck was blown over on nearby Western Lake Road. In Dunedin, high winds brought down trees and power lines, closing some roads, and trapping a dozen cars on Portobello Road between fallen trees, for about two hours. Several flights were cancelled and many others were delayed by extremely strong crosswinds at Dunedin Airport. Power was out in North Dunedin, Outram, parts of Mosgiel and Highcliff Road on the Otago peninsula after winds toppled powerlines. In the Leith Valley, a wind gust broke a large wattle tree off at ground level, blowing it on to a house, and destroying half the roof. Water was cut to about 300 houses in Opoho when a tree fell on a water main about 10 pm. In Oturehua, high winds shattered house windows, and blew down power lines and massive, 125-year old, pine trees. About 500 homes in Becks, Ettrick and Millers Flat were without power for several hours after trees were blown down on lines and one power pole was broken. Ten road signs along a stretch of SH85 between Omakau and Wedderburn were either snapped or damaged by the wind. The Te Anau-Milford highway was closed from the lower Hollyford section due to wind.

On 17 September, a violent overnight storm lifted roofs, sent trampolines flying, and brought down trees and power lines, causing power outages to as many as 30,000 people from Dome Valley near Warkworth to Huntly, including large parts of Auckland. The Coromandel Peninsula, Hauraki, Bay of Plenty, Waikato, Taranaki, Whanganui, Rangitikei and Wairarapa were also hit by power cuts. Farmers were forced to miss

milkings because of the outage and Powerco supplied generators in some cases. SH1 at Rangiriri was reduced to one lane by a fallen tree, and large trees also fell on to the Waikato Expressway, 50 km south of Auckland, hitting one vehicle. The west-bound lanes on Auckland's Northwestern Motorway, were closed after an overhead sign fell between Newton Road and St Lukes. At Clarks Beach on the southern Manukau Harbour, a home was destroyed by strong winds, and two 30 m tall macrocarpa trees were up-rooted into the tide. In Te Puna, heavy wind collapsed a large section of the roof of a large storage shed. In Te Puke, a large artificial shelter, which covered three rows of a kiwifruit orchard, was destroyed and lay strewn across the orchard, with 10 heavy wooden poles uprooted from the ground. In Whakamarama, four avocado trees were brought down by the wind, but damage to orchards in the Western Bay of Plenty was patchy rather than widespread. Further south, Mt Hutt ski field was closed as high winds meant the lifts could not be used.

On 18 September, a flight from Sydney to Rotorua was redirected to Auckland when cross-winds prevented a safe landing in Rotorua. In Mokoia, south-east of Hawera, one farmer lost several heifers after power lines fell and left all of his fences electrified. In South Taranaki, stock were electrocuted on two other farms, with one farm losing five animals, and the other losing one. In Midhurst a roof was blown off a house. On 19 September, Turoa ski field closed after high wind, snowstorms and damage to the chairlift.

Severe winds on 22 September caused power cuts in west Auckland, Waiheke Island, North Shore, Wellsford, western Bay of Plenty, Taranaki, Manawatu and Wairarapa. A twister brought down power lines on SH45 near Oakura southwest of New Plymouth, with property and trees also being damaged. In Auckland, a piece of roofing iron was blown off the Lion Nathan Breweries building and on to train tracks below where it got stuck under the wheel of a train. A small part of the roof was also blown off the domestic terminal at Auckland International Airport.

On 23 September high winds made driving hazardous on SH8 from Raes Junction to Milton, SH1 from Waihola to Gore, and SH90 from Raes Junction to the SH1 intersection. Parts of Dunedin also lost power after gales battered the city. Further north, more trees and powerlines were brought down overnight, cutting power in Manawatu, Taranaki, Rangitikei and western Bay of Plenty. In Wanganui, property damage was reported in the city.

On 11 October, strong winds disrupted flights in and out of New Plymouth Airport, blew down trees and power lines in Inglewood and Taumarunui, and brought down branches near Hunterville.

On 16 October, extremely strong winds fanned a controlled burn on Lake Ohau Station, carrying ash and sparks about 500 m. The fire was contained by about 6 pm.

On 17 October, gale-force winds in Hataitai, Wellington damaged a church steeple, which had to be brought down. At Mangamingi near Eltham, a 25-m gum tree was uprooted. Around Wanaka, the high winds lifted roofs and tossed trampolines in Cardrona, toppled a trailer home at Lake Hawea, and brought down trees at Hawea Flat. At Mount Cook village, wind tore a wall off a building, sucked windows out of vehicles, and uprooted trees.

On 22 December, high winds, heat, and downed power lines set off a spate of fires from Invercargill to North Canterbury. At Leithfield Beach near Amberley, a large fire forced the evacuation of two households, and about 20 homes were evacuated near Rolleston until another fire was contained. The fires were extinguished by the 26th.

On December 24, a landboarder died when high winds flung him into a tree near Nelson.

On December 28, gales caused havoc for emergency services around the lower North Island, bringing down trees and power lines. Police in Wellington said they received a call every two minutes between 7am and midday from people seeking information as the strong winds caused havoc in the city. A large pine tree fell over SH1 south of Mangaweka, between Taihape and Hunterville, and the road was down to one lane. The Rimutaka Hill Road was closed by high winds.

Section 19: Fog

On the morning of 18 January, Wellington airport was affected by fog, with more than 20 outbound flights cancelled, and five incoming flights diverted.

On 14 May, widespread fog across the lower South Island led to the cancellation of flights in and out of Invercargill Airport at both ends of the day.

Fog affected Auckland Airport on 26 June, with about 50 domestic flights delayed or cancelled during the morning.

Fog caused more than a dozen domestic flights in and out of Christchurch Airport to be cancelled, and many others delayed, on 19 July. Several international flights were also affected.

Heavy fog on 3 August caused delays to ferry services in Auckland, and led to the cancellation of more than 50 domestic flights into and out of Auckland International Airport. The fog stretched as far as Hamilton, Rotorua and Taupo.

On 29 September, fog and low cloud disrupted New Plymouth Airport, with flights diverted or cancelled for much of the day.

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