

**National Climate Summary – December 2010: Warm with a sting in the tail**

- **Rainfall:** Below normal for central and eastern North Island and coastal Canterbury; above normal elsewhere
- **Sunshine:** Below normal for much of North Island; above normal in Central and South Otago
- **Temperatures:** Above average for the whole country

In December 2010 there were more anticyclones ('highs') to the east of the North Island than is typical for the time of year, resulting in more airflows from the north and northwest than normal. This resulted in above average temperatures and below average sunshine hours for most places. A severe storm passed over the country on the 27<sup>th</sup> and 28<sup>th</sup> of the month, resulting in significant rainfalls, flooding and gale force winds for many areas.

December rainfall was more than double normal (at least 200 percent) in parts of Northland, Tasman, Nelson, Marlborough and the Southern Alps. Much of this rain fell during a severe storm which passed over the country on the 27<sup>th</sup> and 28<sup>th</sup> of the month. Rainfall was approximately one and a half times normal (around 150 percent) in parts of Auckland, Coromandel, coastal Waikato, Taranaki, Wellington, Buller, West Coast, Otago and Southland. However, parts of Gisborne, Wairarapa and north Canterbury received less than half (50 percent) of their normal December rainfall, while central North Island areas, Manawatu and south Canterbury received about three quarters (75 percent) of their normal rainfall for the month. At the end of December, soil moisture was still below normal in parts of western Northland, Waikato, inland Bay of Plenty, Gisborne, Manawatu, Wairarapa and north Canterbury.

Sunshine totals were below normal (less than 90 percent of normal) across most of the North Island, excluding the Manawatu and Wellington regions. Sunshine totals were above normal (greater than 110 percent) in Central Otago, parts of Fiordland and around Balclutha. Other areas received near average sunshine for the month.

Temperatures for December 2010 were well above average (at least 1.2 °C above average) for much of the country, particularly in Northland, Auckland, Waikato, central North Island, and north and central parts of Canterbury. The New Zealand national average temperature was 17.2 °C (1.6°C above the 1971–2000 December average).

**Further Highlights:**

- The highest temperature was 32.8 °C, recorded at both Rangiora and Christchurch Airport on the 18<sup>th</sup>.
- The lowest temperature was -2.3 °C, recorded at Tara Hills (South Canterbury) on the 8<sup>th</sup> (a new record there).
- The highest 1-day rainfall was 313 mm recorded at Mount Cook on the 27<sup>th</sup> (4<sup>th</sup> highest 1-day rainfall in December since 1928).
- The highest wind gust was 172 km/hr, recorded at Mount Kaukau (Wellington) on the 28<sup>th</sup>.
- Of the six main centres in December 2010, Auckland was the warmest, Wellington the wettest, Christchurch the driest and sunniest, and Dunedin was the coolest. All six centres experienced well above average temperatures for the month.

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**RAINFALL: BELOW NORMAL FOR CENTRAL AND EASTERN NORTH ISLAND AND COASTAL CANTERBURY; ABOVE NORMAL ELSEWHERE**

December rainfall was more than double normal (at least 200 percent) in parts of Northland, Tasman, Nelson, Marlborough and the Southern Alps. Much of this rain fell during a severe storm which passed over the country on the 27<sup>th</sup> and 28<sup>th</sup> 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.

Parts of Gisborne, Wairarapa and north Canterbury received less than half (50 percent) of their normal December rainfall, while central North Island areas, Manawatu and south Canterbury received about three quarters (75 percent) of their normal rainfall for the month.

At the end of December, soil moisture was still below normal in parts of western Northland, Waikato, inland Bay of Plenty, Gisborne, Manawatu, Wairarapa and north Canterbury.

**Record or near-record December rainfall totals were recorded at:**

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
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
Wairoa, North Clyde	19	19	1964	3rd-lowest

**SUNSHINE: BELOW NORMAL FOR MUCH OF NORTH ISLAND; ABOVE NORMAL IN CENTRAL AND SOUTH OTAGO**

Sunshine totals were below normal (less than 90 percent of normal) across most of the North Island, excluding Manawatu and Wellington regions. Sunshine totals were above normal (greater than 110 percent) in Central Otago, parts of Fiordland and around Balclutha. Other areas received near average sunshine for the month.

**Record or near-record December sunshine hours were recorded at:**

Location	Sunshine (hours)	Percentage Of normal	Year records began	Comments
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

## TEMPERATURE: ABOVE AVERAGE FOR WHOLE COUNTRY

Temperatures for December 2010 were well above average (at least 1.2 °C above average) for much of the country, particularly in Northland, Auckland, Waikato, central North Island, and north and central parts of Canterbury. Many locations experienced record high temperatures for the month (see tables below). The New Zealand national average temperature was 17.2 °C (1.6 °C above the 1971–2000 December average)<sup>1</sup>.

### Record or near-record December mean minimum daily air temperatures were recorded at:

Location	Mean minimum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Kaitaia	16.1	2.7	1985	Highest
Kerikeri	15.5	2.8	1981	Highest
Dargaville	15.8	2.9	1943	Highest
Whangarei	16.8	2.8	1967	Highest
Leigh	16.2	1.4	1966	3rd-highest
Whangaparaoa	16.2	1.4	1982	Highest
Kumeu, Auckland	14.3	2.0	1978	Highest
Whenuapai	15.7	3.4	1945	Highest
Whitianga	15.7	3.3	1962	Highest
Paeroa	15.3	2.6	1947	Highest
Tauranga	16.4	3.3	1913	Highest
Te Puke	14.6	2.8	1973	Highest
Whakatane	15.1	2.5	1974	2nd-highest
Rotorua	13.7	2.4	1964	2nd-highest
Taupo	13.3	3.2	1949	Highest
Auckland	17.2	2.6	1959	Highest
Pukekohe	14.5	1.8	1969	2nd-highest
Whatawhata	14.4	2.4	1952	2nd-highest
Hamilton, Ruakura	14.8	3.3	1906	Highest
Port Taharoa	16.3	2.1	1973	Highest
New Plymouth	14.1	1.8	1944	4th-highest
Masterton	12.2	2.0	1906	3rd-highest
Dannevirke	13.4	2.3	1951	3rd-highest
Martinborough	13.0	2.0	1986	3rd-highest
Ngawi	15.0	1.6	1972	3rd-highest
Hastings	14.5	1.9	1965	4th-highest
Palmerston North	13.9	2.5	1928	2nd-highest
Stratford	11.6	2.0	1960	2nd-highest
Hawera	12.9	2.1	1977	3rd-highest
Ohakune	10.8	2.3	1962	3rd-highest
Waiouru	9.3	2.1	1962	4th-highest
Wanganui	14.6	1.8	1937	3rd-highest
Farewell Spit	14.5	2.4	1971	2nd-highest
Reefton	12.0	2.4	1960	2nd-highest
Puysegur Point	11.3	1.4	1978	2nd-highest
Nelson	13.8	1.5	1943	3rd-highest
Blenheim	13.3	1.9	1941	Highest
Kaikoura	13.2	1.6	1963	3rd-highest
Arthurs Pass	9.1	2.5	1978	2nd-highest
Culverden	12.2	2.8	1928	Highest
Winchmore	12.1	2.8	1928	4th-highest
Waipara West	12.7	2.3	1973	2nd-highest
Orari Estate	11.4	2.3	1972	3rd-highest
Alexandra	11.1	2.1	1983	3rd-highest
Tiwai Point	11.4	1.6	1970	2nd-highest

<sup>1</sup> Interim monthly value.

**Record or near-record December mean maximum daily air temperatures were recorded at:**

Location	Mean maximum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Kaitaia	23.6	1.1	1985	Highest
Kerikeri	23.6	1.0	1981	3rd-highest
Dargaville	24.1	2.0	1943	Highest
Whangarei	24.6	1.9	1967	2nd-highest
Leigh	23.1	2.1	1966	Highest
Warkworth	22.9	1.6	1966	2nd-highest
Whangaparaoa	23.0	2.4	1982	Highest
Kumeu, Auckland	22.8	0.9	1978	4th-highest
Whenuapai	23.5	1.6	1945	3rd-highest
Auckland	23.6	1.9	1959	2nd-highest
Whatawhata	23.2	2.0	1952	4th-highest
Hamilton, Ruakura	24.6	2.5	1906	3rd-highest
Port Taharoa	22.5	1.3	1973	4th-highest
New Plymouth	21.6	1.9	1944	3rd-highest
Martinborough	23.4	1.2	1986	4th-highest
Ngawi	22.4	2.2	1972	3rd-highest
Wallaceville	22.0	2.2	1939	4th-highest
Ohakune	21.3	2.5	1962	2nd-highest
Waiouru	20.0	2.3	1962	Highest
Wanganui	23.1	2.4	1937	Highest
Takaka	22.7	1.9	1978	3rd-highest
Westport	20.2	1.9	1937	4th-highest
Lake Rotoiti	21.2	2.6	1965	2nd-highest
Reefton	23.0	2.1	1960	4th-highest
Motueka, Riwaka	24.6	3.0	1956	Highest
Appleby	22.2	1.7	1943	4th-highest
Nelson	22.5	2.1	1943	2nd-highest
Kaikoura	22.1	3.1	1963	Highest
Arthurs Pass	17.8	2.0	1978	3rd-highest
Le Bons Bay	20.0	2.5	1984	2nd-highest
Dunedin	19.1	1.7	1947	4th-highest
Lumsden	20.5	1.7	1982	3rd-highest
Nugget Point	17.7	1.4	1970	3rd-highest

**DECEMBER CLIMATE IN THE SIX MAIN CENTRES**

Of the six main centres in December 2010, Auckland was the warmest, Wellington the wettest, Christchurch the driest and sunniest, and Dunedin was the coolest. All six centres experienced well above average temperatures for the month.

**December 2010 main centre climate statistics:**

Location	Mean temp. (°C)	Departure from normal (°C)		Rainfall (mm)	% of normal		Sunshine (hours)	% of normal	
Auckland <sup>a</sup>	19.9	+1.8	Well above average	113	128%	Above normal	169	81%	Below normal
Tauranga <sup>b</sup>	19.8	+2.2	Well above average	113	124%	Above normal	189	81%	Below normal
Hamilton <sup>c</sup>	19.4	+2.8	Well above average	120	122%	Above normal	159 <sup>g</sup>	72%	Well below normal
Wellington <sup>d</sup>	16.5	+1.2	Well above average	125	145%	Above normal	189	84%	Below normal
Christchurch <sup>e</sup>	17.8	+2.0	Well above average	35	76%	Below normal	204	92%	Near normal

Dunedin <sup>f</sup>	15.3	+1.4	Well above average	120	147%	Above normal	167	99%	Near normal
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<sup>a</sup> Mangere   <sup>b</sup> Tauranga Airport   <sup>c</sup> Hamilton Airport   <sup>d</sup> Kelburn   <sup>e</sup> Christchurch Airport   <sup>f</sup> Musselburgh   <sup>g</sup> Ruakura

## HIGHLIGHTS AND EXTREME EVENTS

### • Heavy rain and slips

Some Marlborough mussel harvesting areas were closed on 17 December after rain, and all but one of the 19 mussel harvesting areas were closed by 22 December after rain washed sediment into the Sounds.

On 18 December, heavy rain in the Eastern Bay of Plenty caused land slips, cut power, and blocked roads. Power was cut about 11 pm and restored mid-morning on 19 December. The forestry road, used as a detour for SH36, the main East Coast Rd, damaged by floods and landslides in winter and still under repair, was closed for a short time by surface flooding. The main road into the small town of Ruatoki was also blocked by slips.

On 19 December, heavy rain caused surface flooding in parts of Taranaki.

On 20 December, SH35 was closed by a slip at Maraenui Bluff (east of Opotiki).

On 21 December, SH94 between Te Anau and Milford Sound was closed by a slip. SH6 was affected by flooding between Harihari and Haast. SH3 from Renwick to Nelson was closed by slips and flooding, and several roads in the Marlborough Sounds were also closed.

On 22 December, the Department of Conservation issued a high alert for the Young Valley-Gillespie Pass circuit track, after heavy rain increased the risk the dam would burst and flood the valley below.

Heavy rain hit Westland, the Southern Alps and parts of Otago on the 27<sup>th</sup> and much of the rest of the country on the 28<sup>th</sup>. 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, near Collingwood. A bridge in the Glen Roy Valley, near Murchison, was washed out.

The Aorere River and the Anatoki and Waingaro Rivers exceeded their banks. The Riwaka River experienced average flooding. The road to Ferntown, between Collingwood and the start of the Heaphy Track, was impassable. A slip across about 300 m of Readers Road near Havelock took out power poles and cut power. At Pelorus Bridge, campers waded through waist-deep water in the dark in an emergency evacuation at 4am, as the Pelorus River overflowed. Near Omarama in the Waitaki basin, severe rain forced campers to flee a free camping site near the Ahuriri River.

### Record or 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
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

- **Temperature**

Many temperature records were broken in December 2010 (see tables below). The lowest temperature recorded in December 2010 was -2.3°C, at Tara Hills on the 9<sup>th</sup>. The highest temperature recorded in December 2010 was 32.8°C, at both Rangiora and Christchurch Airport on the 18<sup>th</sup>.

**Record or near-record daily minimum air temperatures were recorded at:**

Location	Extreme minimum temperature (°C)	Date of extreme temperature	Year records began	Comments
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
Kaitaia	20.3	28th	1985	Highest
Dargaville	20.6	28th	1951	Highest
Whangarei	20.5	28th	1967	2nd-highest
Leigh	19.7	28th	1966	2nd-highest
Warkworth	19.9	28th	1966	Highest
Whangaparaoa	19.6	28th	1982	Highest
Kumeu, Auckland	19.5	28th	1978	Highest
Whenuapai	20.6	28th	1951	Highest
Paeroa	21.0	21st	1971	Highest
Tauranga	20.4	22nd	1941	Highest
Whakatane	20.3	22nd	1975	Highest
Rotorua	19.1	22nd	1972	Highest
Taupo	19.4	22nd	1950	Highest
Pukekohe	19.4	28th	1969	Equal 4th-highest
Hamilton	21.8	22nd	1940	Highest
Port Taharoa	20.2	19th	1974	Highest
New Plymouth	19.2	19th	1944	2nd-highest
Takapau Plains	17.3	28th	1972	4th-highest
Martinborough	19.3	19th	1986	2nd-highest
Gisborne	21.7	22nd	1940	2nd-highest
Napier	22.4	22nd	1940	Highest
Hastings	21.1	22nd	1972	Equal highest
Wairoa, North Clyde	21.9	28th	1972	2nd-highest
Paraparaumu	18.4	21st	1972	4th-highest
Palmerston North	19.1	21st	1940	Highest
Wallaceville	18.2	19th	1972	4th-highest
Hawera	18.9	19th	1977	Highest
Ohakune	17.0	21st	1972	2nd-highest
Waiouru	16.7	21st	1972	Highest
Wanganui	20.0	28th	1987	Equal highest
Farewell Spit	17.8	19th	1972	2nd-highest
Hokitika	16.7	18th	1964	4th-highest

Reefton	17.6	21st	1972	Highest
Nelson	18.6	19th	1943	2nd-highest
Culverden	19.1	22nd	1930	4th-highest
Winchmore	19.5	21st	1928	4th-highest
Waipara West	21.0	21st	1973	Equal 3rd-highest
Christchurch	20.5	21st	1863	4th-highest
Dunedin	17.6	27th	1947	2nd-highest
Cromwell	18.6	13th	1949	Equal 3rd-highest
Alexandra	17.4	21st	1983	3rd-highest
Invercargill	16.3	27th	1948	4th-highest
Tiwai Point	16.0	27th	1972	2nd-highest

#### Record or near-record daily maximum air temperatures were recorded at:

Location	Extreme maximum temperature (°C)	Date of extreme temperature	Year Records Began	Comments
Ngawi	12.8	8th	1972	Equal 4th-lowest
Hicks Bay	15.2	8th	1972	3rd-lowest
Motueka, Riwaka	14.6	8th	1972	4th-lowest
Appleby	14.4	8th	1943	Equal 4th-lowest
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

- **High winds**

The highest gust observed during December 2010 was 172 km/hr, recorded at Mount Kaukau (Wellington) on the 28<sup>th</sup>.

On 21 December, high winds in central Christchurch downed a tree and crushed a parked vehicle. Spencer Beach Holiday Park in North Canterbury lost power after lines came down. Throughout Canterbury and North Otago, firefighters were called out to numerous vegetation fires started by the wind. In Timaru, gusts brought down power lines and power poles, cutting power to 3500 customers for about three hours. In Stafford Street, Timaru, a pole holding a string of Christmas decorations snapped and fell over, leaving lights and two angels suspended above the road, with just enough room for cars to pass underneath. Trees were brought down across the Waitaki District, and wind-fanned fires closed SH82 near Waimate. High wind warnings were in force for high sided vehicles on SH77 from Darfield to Ashburton, SH75 from Halswell to Akaroa, SH7, the Lewis Pass, and SH73 from Springfield to Arthurs Pass. In Dunedin several flights were unable to land because of the strong northwesterly winds. Customers in the city and surrounding area lost power, roofs were lifted off homes, and firefighters tackled many fires triggered by the hot windy weather and arcing or downed power lines. In Opoho a large pine tree smashed a water main, cutting supply to 200 homes overnight. In Marlborough, several large tree branches were brought down, blocking Kenepuru Road in the Marlborough Sounds. In the Rai Valley fierce winds blew a 10-m square



shed from its foundation and threw it up to 40 m on to power lines in the Ronga Valley. The power lines were severed and arced cutting power to the area, and the shed was destroyed. In Wellington, wind blew over a tree which brought down trolley bus lines in Thorndon near the Botanic Gardens, blocking both lanes and causing traffic chaos, and in Mt Victoria, a toppled tree damaged a car. The Zephyrometer wind sculpture at the south end of Evans Bay was horizontal across the road at times in the northwesterly gales. One early-afternoon flight from Blenheim to Wellington was forced to turn back when strong winds at Wellington Airport prevented it from landing.

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 26<sup>th</sup>.

On the 24<sup>th</sup>, a landboarder died when high winds flung him into a tree near Nelson.

Several locations experienced very high winds on the 28<sup>th</sup>. 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.

**Near-record high extreme wind gusts for December were recorded at:**

Location	Extreme wind gust speed (km/hr)	Date of extreme gust	Year records began	Comments
Castlepoint	150	24th	1972	Equal highest
Napier	91	28th	1973	Equal 3rd-highest
Hawera	93	28th	1986	Highest
Westport	100	28th	1973	3rd-highest
Puysegur Point	145	21st	1986	Equal 2nd-highest
Winchmore	100	21st	1970	Highest
Dunedin	104	21st	1981	Equal highest
Lauder	102	24th	1981	Equal 4th-highest

• **Lightning and hail**

On 18 December, severe thunderstorms affected Hawkes Bay between the Ruahine Ranges and Waipukurau.

• **Fog**

In Rotorua, six flights were cancelled because of low-lying cloud, two on the 18<sup>th</sup> and four on the 19<sup>th</sup>.

On 21 December, passengers were stranded when low cloud and sea fog closed New Plymouth airport.

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