

A wet and cloudy month for many.

Rainfall	Rainfall was above normal (120-149% of normal) for large parts of the North Island with the exception of coastal Gisborne and Hawke's Bay where below normal (50-79% of normal) or well below normal (<50% of normal) rainfall was observed. In the South Island, rainfall was above normal in Otago, Tasman, Nelson, Marlborough and large parts of Canterbury while Southland received near normal rainfall (80-119% of normal).
Sunshine	Sunshine was below normal (75-89% of normal) for virtually the entire South Island with the exception of parts of coastal Otago and Canterbury where near normal (80-109% of normal) sunshine hours were observed. Sunshine was also below normal in Taranaki, western Manawatu-Whanganui and Wellington. Conversely above normal (110-125% of normal) sunshine was observed in Northland as well as eastern Waikato, Bay of Plenty, Gisborne and Hawke's Bay.
Temperature	November temperatures were near average (-0.50 to 0.50°C) for much of New Zealand. The exceptions were Gisborne and Hawke's Bay as well as parts of Manawatu-Whanganui and coastal Canterbury which observed above average temperatures (0.51°C to +1.20°C).
Soil Moisture	At the end of November 2016, soil moisture levels were below normal for the time of year for northern Waikato, the East Cape, southern Hawke's Bay and northern Canterbury. Above normal soil moisture levels for the time of year were found around the Wellington, Tasman, Nelson, Marlborough, Bay of Plenty, Southland and Otago regions. Soil moisture levels for the remainder of the country were near normal for this time of year.

Click on the link to jump to the information you require:

[Overview](#)

[Rainfall](#)

[Sunshine](#)

[Temperature](#)

[November 2016 climate in the six main centres](#)

[Highlights and extreme events](#)

Overview

A series of stormy low pressure systems passed over New Zealand during November 2016. These lows brought with them more rain, cloud and westerly winds than typically observed during November. As detailed in the *Highlights and Extremes* section, two such lows brought copious rain to the country's capital just days apart. As a result Wellington observed its wettest November on record, with records beginning in 1928. The surrounding areas of Upper Hutt and Paraparaumu also observed near record November rainfall totals due to the events. Above normal rainfall (120-149% of the November normal)

was likewise observed in the Bay of Plenty, Taranaki, Tasman and Nelson as well as parts of Marlborough and Otago. Conversely, rainfall was below normal (50-79% of the November normal) or well below normal (<50% of the November normal) in Gisborne and Hawke's Bay, with Gisborne receiving just 18% of its usual November rainfall.

The above normal rainfall seen in many parts of the country during November also meant that the sky was cloudier than normal over the wet areas. In the North Island, western areas saw the least amount of sunshine with both Paraparaumu and Palmerston North recording their cloudiest November on record (with records extending back to 1953 and 1930 respectively). The cloud did not extend to Northland though where above normal sunshine was observed (110-125% of the November normal), with Whangarei seeing its second sunniest November on record (records extend back to 1954). Sunshine was also above normal in eastern Waikato, Bay of Plenty, Gisborne and Hawke's Bay. Sunshine was below normal (75-89% of the November normal) for virtually the entire South Island with the exception of coastal parts of Canterbury and Otago where sunshine hours were near normal (80-109% of the November normal).

Despite the rain and cloudy skies, November temperatures around the country were mostly in the near average range (-0.50°C to +0.50°C of the November average). The exceptions were Gisborne and Hawke's Bay as well as parts of Manawatu-Whanganui and coastal Canterbury which observed above average temperatures (0.51°C to +1.20°C of the November average). The nationwide average temperature in November 2016 was 14.1°C (0.4°C above the 1981-2010 November average from NIWA's seven station temperature series which begins in 1909), making November 2016 the warmest November since 2013.

The rain over central New Zealand during November raised soil moisture levels to above normal for the time of year around Wellington, Nelson, Tasman, Marlborough and large parts of Bay of Plenty, Otago and Southland. Despite this, drier than normal soils continue to persist for northern coastal Canterbury and coastal Wairarapa.

Further Highlights:

- The highest temperature was 34.8°C, observed at Gisborne on 23 November. This was the 2nd warmest temperature recorded in New Zealand during November on record.
- The lowest temperature was -1.5°C, observed at Hanmer Forest on 1 November.
- The highest 1-day rainfall was 175.8 mm, recorded at Milford Sound on 8 November.
- The highest wind gust was 182 km/hr, observed at Cape Turnagain on 29 November.
- Of the six main centres in November 2016, Wellington was the wettest and cloudiest, Dunedin was the coldest, Christchurch was the driest, Tauranga was the sunniest and Auckland and Tauranga were equally warmest.
- Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2016 so far (1 January – 30 November) were Richmond (2551 hours), Blenheim (2339 hours), Takaka (2288 hours) and New Plymouth (2228 hours).

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Rainfall: A wet month for most with a handful of exceptions.

The passage of several low pressure systems throughout the month contributed to a very wet November for many parts of New Zealand. In the North Island, above normal rainfall (120-149%) was recorded in parts of almost every region. The exceptions were Gisborne and Hawke's Bay where below (50-79%) or well below (<50%) normal rainfall was observed. Although not a record, Gisborne recorded just 12mm of rain in November or 18% of its normal rainfall. Conversely, Taranaki, western Manawatu-Whanganui and Wellington received well above normal rainfall with Wellington seeing its wettest November on record with records extending back to 1928.

The South Island, likewise, had a wet month. Southland and northern Canterbury managed to dodge the bulk of the rain and recorded near normal (80-119%) November rainfall, however, the remainder of the South Island saw above (120-149%) or well above (>149%) normal rainfall. Most notably, Dunedin had its 3rd wettest November on record with records extending to 1918 and Middlemarch had its 4th wettest November with records beginning in 1896.

Record¹ or near-record November rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
High records or near-records				
Wellington (Kelburn)	252	257	1928	Highest
Oamaru	144	338	1898	2nd-highest
Motu	366	210	1920	3rd-highest
Martinborough	158	255	1924	3rd-highest
Paraparaumu	190	241	1945	3rd-highest
Upper Hutt (Trentham)	247	244	1924	3rd-highest
Dunedin (Musselburgh)	134	237	1918	3rd-highest
Palmerston North	155	195	1928	4th-highest
Middlemarch	117	258	1896	4th-highest
South West Cape	156	143	1991	4th-highest
Low records or near-records				
Secretary Island	163	46	1985	2nd-lowest

Sunshine: Cloudy in the South Island and west of the North Island.

It was a cloudy month for much of the South Island with below normal sunshine (75-89% of normal) recorded at many locations. The exceptions were some coastal parts of Canterbury and Otago where near normal sunshine (80-109% of normal) was observed.

¹ The rankings (1st, 2nd, 3rd.etc) in all Tables in this summary are relative to climate data from a *group* of nearby stations, some of which may no longer be operating. The current climate value is compared against all values from any member of the group, without any regard for homogeneity between one station's record, and another. This approach is used due to the practical limitations of performing homogeneity checks in real-time.

In the North Island the cloudiest skies were where the most amount of rain fell. As a result, sunshine was below (75-89% of normal) to well below (<75% of normal) normal for Taranaki, Manawatu-Whanganui and Wellington. Palmerston North observed its cloudiest November on record (records began in 1930) with just 55% of the usual sunshine hours observed there. Conversely above normal (110-125% of normal) sunshine was observed in Northland as well as eastern Waikato, Bay of Plenty, Gisborne and Hawke's Bay.

Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2016 so far (1 January – 30 November) were Richmond (2551 hours), Blenheim (2339 hours), Takaka (2288 hours) and New Plymouth (2228 hours).

Record or near-record November sunshine hours were recorded at:

Location	Sunshine hours	Percentage of normal	Year records began	Comments
High records or near-records				
Whangarei	232	134	1954	2nd-highest
Kaitaia	241	126	1951	3rd-highest
Low records or near-records				
Paraparaumu	118	59	1953	Lowest
Palmerston North	90	55	1930	Lowest
Balclutha	127	76	1964	2nd-lowest
Turangi	165	84	1976	4th-lowest

Temperature: Near average for most, warm for the east of the North Island.

Despite a wet and cloudy month for many parts of the country, November temperatures were near average (-0.50 to 0.50°C) for the majority of New Zealand. The exceptions were Gisborne and Hawke's Bay as well as parts of Manawatu-Whanganui and coastal Canterbury which observed above average temperatures (0.51°C to +1.20°C). A handful of locations in coastal Gisborne and Hawke's Bay saw well above average temperatures (>1.20°C) during November. In particular, Gisborne experienced its 3rd warmest November on record with records extending all the way back to 1905. No locations observed record or near record low mean minimum temperatures.

The nationwide average temperature in November 2016 was 14.1°C (0.4°C above the 1981-2010 November average from NIWA's seven station temperature series which begins in 1909).

Record or near-record mean air temperatures for November were recorded at:

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Waione	16.3	1.4	1991	Highest
Mahia	16.1	1.2	1990	Highest
Masterton	15.6	1.7	1906	2nd-highest
Gisborne	17.6	1.9	1905	3rd-highest
Cheviot	14.0	1.0	1982	4th-highest

Low records or near-records

None observed

Record or near-record mean maximum air temperatures for November were recorded at:

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Mahia	19.9	1.7	1990	3rd-highest
Kaikoura	19.1	2.1	1963	3rd-highest
Motu	17.6	1.0	1990	4th-highest
Hastings	23.2	2.9	1965	4th-highest
Low records or near-records				
Port Taharoa	17.4	-1.6	1973	2nd-lowest

Record or near-record mean minimum air temperatures for November were recorded at:

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Whatawhata	12.2	1.8	1952	Highest
Waione	11.6	2.0	1991	Highest
Hawera	11.2	1.7	1977	Highest
Dannevirke	11.2	2.2	1951	3rd-highest
Mahia	12.4	0.9	1990	3rd-highest
Paraparaumu	12.1	1.8	1953	3rd-highest
Levin	11.8	1.7	1895	3rd-highest
Akaroa	10.3	1.6	1978	3rd-highest
Masterton	9.9	2.1	1906	4th-highest
Waiau	8.9	1.8	1974	4th-highest
Oamaru	8.7	1.0	1967	4th-highest
Lauder	7.7	1.9	1924	4th-highest
Low records or near-records				
Kaikoura	7.8	-1.9	1963	3rd-lowest
Motu	5.9	-1.5	1990	4th-lowest

November climate in the six main centres

November temperatures were near average for all of the six main centres with the exception of Tauranga where above average temperatures were recorded. Both Tauranga and Christchurch had near normal rainfall during November while the remaining main centres saw above or well above normal rainfall. Wellington had its wettest November on record while Dunedin had its third wettest November on record. Of the six main centres in November 2016, Wellington was the wettest and cloudiest, Dunedin was the coldest, Christchurch was the driest, Tauranga was the sunniest and Auckland and Tauranga were equally warmest.

November 2016 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland ^a	16.6	+0.5	Near average
Tauranga ^b	16.6	+0.7	Above average
Hamilton ^c	14.8	+0.1	Near average
Wellington ^d	13.8	+0.4	Near average
Christchurch ^e	13.9	+0.4	Near average
Dunedin ^f	12.5	+0.1	Near average
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland ^a	79	121%	Above normal
Tauranga ^b	78	105%	Near normal
Hamilton ^c	116 ²	130%	Above normal
Wellington ^d	152	257%	Well above normal (Highest on record)
Christchurch ^e	47	101%	Near normal
Dunedin ^f	134	237%	Well above normal (3 rd highest on record)
Sunshine			
Location	Sunshine (hours)	% of normal	Comments
Auckland ^a	194	100%	Near normal
Tauranga ^b	243	108%	Near normal
Hamilton ^g	176	93%	Near normal
Wellington ^d	180	86%	Below normal
Christchurch ^e	201	90%	Near normal
Dunedin ^f	179 ³	107%	Near normal

^a Mangere ^b Tauranga Airport ^c Hamilton Airport ^d Kelburn ^e Christchurch Airport ^f Musselburgh ^g Ruakura

² Missing 3 days of data

³ Missing 1 day of data

Highlights and extreme events

Rain and slips

On 6 November, heavy rain caused a washout on State Highway 6 at south Westland's Jamie Creek bridge.

On the morning of 7 November, heavy rain caused flooding on the Waikato Expressway causing traffic blockages and two non-injury crashes in Hamilton. Minor surface flooding was also reported in Palmerston North where the city's highest November 1-day rainfall total was observed.

On 11 November, steady rain led to flooded roads and houses in the Wellington suburbs of Mornington and Kaiwharawhara with some residents evacuated as a precaution after slips.

On 15 November, a very heavy rain event caused flooding around Wellington, resulting in the closure of SH1 and SH2 for a time during the afternoon. Upper Hutt and Lower Hutt observed the equivalent of their normal November rainfall (whole month) in less than 24 hours with each location receiving more than 90mm rain. About 500 homes in Pukerua and the Porirua suburb of Camborne were without power for some time due to a flood-related slip. The flooding also closed schools and disrupted NCEA exams in the region. Earlier in the day, the heavy rain impacted Marlborough causing the highway between Blenheim and Nelson to close due to flooding in Canvastown. Pelorous River breached its banks and evacuations were planned in the area. The steady rain had also triggered flood alerts in Otago as well as hampering earthquake recovery efforts around the Kaikoura and Wellington areas.

The highest 1-day rainfall in November 2016 was 175.8 mm, recorded at Milford Sound on 8 November.

Record or near-record November extreme 1-day rainfall totals were recorded at:

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Palmerston North	50	7th	1928	Highest
Martinborough	72	7th	1924	2nd-highest
Auckland (Whangaparaoa)	49	6th	1946	3rd-highest
Masterton	51	7th	1926	4th-highest
Takaka	123	14th	1976	4th-highest
Farewell Spit	70	14th	1882	4th-highest

Temperatures

The lowest temperature was -1.5 °C, observed at Hanmer Forest on 1 November.

On 23 November, a foehn wind sent temperatures soaring across the eastern part of both the North and South Island. For the first time since March, or in 8 months, the 30°C mark was officially eclipsed in New Zealand. Gisborne had its hottest November day on record, reaching 34.8°C. This made it the 2nd hottest temperature ever recorded in New Zealand during the month of November. Wairoa also had its hottest November day on record, reaching 34.1°C and making it the 4th warmest November temperature ever recorded in New Zealand. Several other locations also saw their record or near record warmest November day on the 23rd. In addition, many other locations also observed record or near record warm minimum temperatures on that day.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Gisborne	34.8	23rd	1905	Highest
Napier	33.4	23rd	1868	Highest
Hastings	32.7	23rd	1965	Highest
Whakatu	31.9	23rd	1868	Highest
Wairoa	34.1	23rd	1964	Highest
Mahia	27.7	23rd	1990	Equal highest
South West Cape	23.7	25th	1991	2nd-highest
Cheviot	30.5	23rd	1982	3rd-highest
Tiwai Point	25.8	22nd	1970	3rd-highest
Whitianga	26.8	22nd	1962	Equal 3rd-highest
Turangi	26.8	23rd	1968	Equal 3rd-highest
Motueka	28.6	23rd	1956	Equal 3rd-highest
Waipara West	29.8	23rd	1973	4th-highest
Nugget Point	26.1	22nd	1970	4th-highest
Low records or near-records				
None observed				

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Ranfurly	16.1	23rd	1897	Highest
Roxburgh	18.1	23rd	1950	2nd-highest
Alexandra	17.3	23rd	1930	Equal 2nd-highest
Oamaru	16.2	23rd	1972	3rd-highest
Cromwell	17.0	23rd	1949	3rd-highest
Lauder	16.3	23rd	1924	Equal 3rd-highest
Wanaka	15.5	23rd	1972	4th-highest
Dunedin	15.8	23rd	1972	4th-highest
Mahia	16.6	16th	1990	Equal 4th-highest
Motueka	15.9	10th	1972	Equal 4th-highest
Waiau	16.7	23rd	1974	Equal 4th-highest
Low records or near-records				
Stratford	0.0	1st	1960	2nd-lowest
Warkworth	3.2	1st	1966	Equal 2nd-lowest
Whangarei	4.2	1st	1967	4th-lowest

Wind

On 7 November, several small tornadoes were reported across the Bay of Plenty region. A small tornado touched down in Ohope. Trees were uprooted, roofs lifted, windows smashed and trampolines went flying. Another tornado was reported in Katikati earlier in the day while a kiwifruit orchard in Opotiki was also reportedly struck by a mini tornado.

On 14 November, strong winds in Taranaki knocked down trees and downed powerlines leaving thousands of homes without power.

On 15 November, strong winds uprooted a historic oak tree in Thames.

On 16 November, a small tornado knocked over fences and snapped trees in Waikanae north of Wellington.

The highest wind gust was 182 km/hr, observed at Cape Turnagain on 29 November.

Record or near-record November extreme wind gusts were recorded at:

Location	Extreme wind gust (km/hr)	Date of extreme gust	Year records began	Comments
Waiouru	143.0	15th	1970	Highest
Westport	106.0	27th	1973	Highest
Hawera	100.0	15th	1986	2nd-highest
Puysegur Point	146.0	26th	1986	Equal 2nd-highest
South West Cape	163.0	26th	1991	3rd-highest
Wanganui	91.0	7th	1977	Equal 4th-highest

Snow and ice

On 17 November, during the early morning hours, snow fell down to 700m across the South Island.

On 27 November snow fell on some higher roads in the South Island. Milford Road was closed due to snow in the early morning and snow was also reported on the Crown Range with snow settling to 600m around Queenstown.

Lightning and hail

On 3 November, thunderstorms were active in Canterbury during the afternoon. A lightning strike in Hornby hit a tree and set it on fire which subsequently spread to a nearby garage. Meanwhile, Waimate reported 7 centimetres of hail between 2-3pm which caused some building damage as well as flooding causing many businesses in the township to close for the afternoon.

On 7 November, thunderstorms were active over Northland during the very early morning hours. Thunder and lightning was accompanied by heavy rain.

On 14 November, a phenomena sometimes called “earthquake lightning” was observed. During and after Culverden’s magnitude 7.8 earthquake, coloured light was observed flashing in the sky above Wellington.

On 16 November, thunder, lightning and hailstones as large as \$2 coins were reported in Ashburton. Crop damage was minimal as was damage to cars and property.

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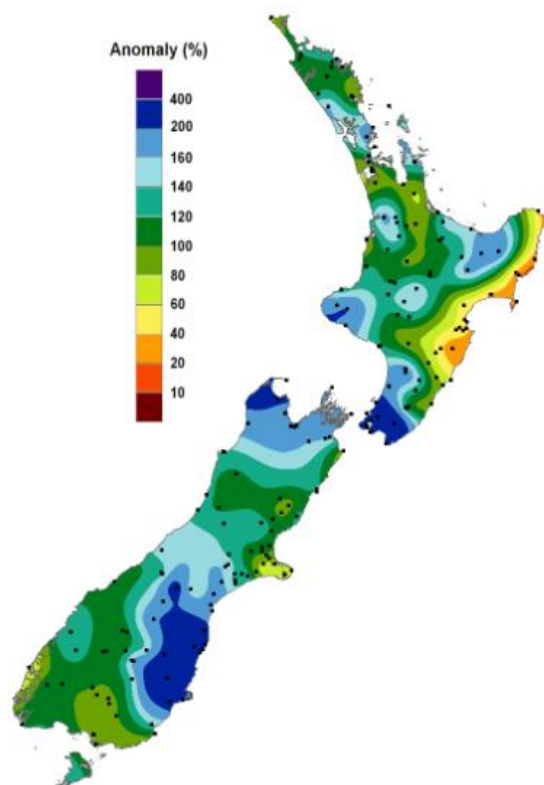
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November 2016 rainfall, expressed as a percentage of the 1981-2010 normal.

Rainfall was above normal (120-149% of normal) for large parts of the North Island with the exception of coastal Gisborne and Hawke’s Bay where below normal (50-79% of normal) or well below normal (<50% of normal) rainfall was observed. In the South Island rainfall was above normal in Otago, Tasman, Nelson, Marlborough and large parts of Canterbury while Southland received near normal rainfall (80-119% of normal).

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