

A dry end to the year with average to below average temperatures.

Rainfall	Rainfall was below normal (50-79% of normal) or well below normal (<50% of normal) for the majority of the country during December. The exceptions were the western fringes of Southland, the West Coast, Tasman and Wellington regions where rainfall was near normal (80-119% of normal). Above normal rainfall (120-149% of normal) was recorded at a handful of locations.
Soil Moisture	At the end of December 2016, soil moisture levels were below normal for the time of year for much of the North Island with the driest soils compared to normal located in the Far North. Soils were also slightly drier than normal about Southland and Otago with the remainder of the South Island seeing near normal soil moisture levels.
Sunshine	Sunshine was well above normal (>125% of normal) in the north and west of the North Island as well as parts of the West Coast, Southland and Otago. Sunshine was near normal (90-109% of normal) or above normal (110-125% of normal) for the remainder of the country.
Temperature	December temperatures were below average (-1.20°C to -0.51°C of average) for parts of Waikato, Taranaki, Wellington, Tasman and the West Coast. The remainder of the country experienced near average (-0.50 to +0.50°C of average) temperatures.

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Overview

December was characterised by lower than normal pressure to the south of New Zealand and the frequent passage of highs over the North Island. This pressure anomaly led to slightly more westerly and southwesterly winds than normal across the country.

After a wet November, December rainfall was quite the opposite, with the majority of the country observing below normal (50-79% of the December normal) or well below normal (<50% of the December normal) rainfall amounts. Some of the lowest December rainfall totals were recorded in Northland with Kerikeri seeing just 9mm of rain (or 8% of normal), its lowest December rainfall on record with records extending back to 1935. The exceptions to the low rainfall were the western fringes of Southland, the West Coast, Tasman and Wellington regions where rainfall was near normal

(80-119% of the December normal). Above normal rainfall (120-149% of the December normal) was recorded at a handful of locations.

The lack of meaningful rain throughout the month meant that sunshine was plentiful with no locations observing below normal sunshine hours (75-89% of the December normal) or lower. Near normal sunshine hours (90-109% of the December normal) were recorded about Nelson, Marlborough, Wellington and Thames-Coromandel with the remainder of the country seeing above normal (110-125% of the December normal) or well above normal (>125% of the December normal) sunshine hours. Both Kaitaia and Dunedin experienced their second sunniest Decembers on record.

The lack of rainfall during December and sunny skies meant that soil moisture levels dropped drastically across the majority of the country throughout the month. The unlikely exception to this was coastal Hurunui where soil moisture levels increased and are now only slightly below normal for this time of year. This part of the country has seen drought conditions throughout much of 2015 and 2016. As of 1 January, soil moisture levels were below normal for this time of year for much of the North Island with the driest soils compared to normal located in the Far North. Soils were also slightly drier than normal about Southland and Otago with the remainder of the South Island seeing near normal soil moisture levels.

Despite the sunny skies, winds from a westerly to southwesterly direction kept temperatures on the mild side. In most locations, temperatures were near average (-0.50 to +0.50°C of average). However, pockets of below average temperatures (-1.20°C to -0.51°C of average) were found in Waikato, Taranaki, Wellington, Tasman and parts of the West Coast. December was the only month of the year where no climate stations observed record or near-record high monthly mean temperatures. The nationwide average temperature in December 2016 was 15.4°C (0.3°C below the 1981-2010 December average from NIWA's seven station temperature series which begins in 1909).

Further Highlights:

- The highest temperature was 33.2°C, observed at Christchurch (Riccarton) on 21 December.
- The lowest temperature was -1.2°C, observed at Hanmer Forest on 20 December.
- The highest 1-day rainfall was 152.2 mm, recorded at Takaka on 7 December.
- The highest wind gust was 161 km/hr, observed at Akitio on 15 December.
- Of the six main centres in December 2016, Wellington was the wettest, Auckland was the warmest and driest, Dunedin was the coolest. Tauranga was the sunniest and Christchurch was the least sunny.
- Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2016 (1 January – 31 December) were Richmond (2840 hours), Blenheim (2582 hours), Takaka (2534 hours) and New Plymouth (2503 hours).

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

December was devoid of major rain events and for most locations it was a very dry month with below normal (50-79% of normal) or well below normal (<50% of normal) rainfall observed. Northland was the driest region during December with less than a third of normal December rainfall recorded at many of the climate stations in the area. Most notably, Kerikeri saw just 9mm of rain (or 8% of normal), its lowest December rainfall on record with records extending back to 1935.

The exceptions to the low rainfall were the western fringes of Southland, parts of the West Coast, Tasman and Wellington regions where rainfall was near normal (80-119% of the December normal). The only locations that recorded above normal December rainfall were Takaka, Westport, Hokitika, Kaikoura and Christchurch.

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

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
High records or near-records				
None observed				
Low records or near-records				
Kerikeri	9	8	1935	Lowest
Auckland (North Shore)	20	21	1966	2nd-lowest
Auckland (Western Springs)	19	20	1948	2nd-lowest
Dannevirke	28	35	1951	2nd-lowest
Secretary Island	162	41	1985	2nd-lowest
Turangi	52	38	1968	3rd-lowest
Waione	34	44	1991	3rd-lowest
Balclutha	19	27	1964	3rd-lowest
Leigh	23	30	1966	4th-lowest

Sunshine: A sunny December across the country.

December was a sunny month around New Zealand with no locations observing below normal sunshine hours (75-89% of normal) or lower. The lack of rain, and therefore cloud throughout the month was the main contributor to the sunny skies. Some of the driest areas around Northland and Otago saw the brightest skies with both Kaitaia and Dunedin experiencing their second sunniest Decembers on record.

Overall, near normal sunshine hours (75-89% of normal) were recorded about Nelson, Marlborough, Wellington and Thames-Coromandel with the remainder of the country seeing above normal (110-125% of normal) or well above normal (>125% of the December normal) sunshine hours.

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.

Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2016 (1 January – 31 December) were Richmond (2840 hours), Blenheim (2582 hours), Takaka (2534 hours) and New Plymouth (2503 hours).

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

Location	Sunshine hours	Percentage of normal	Year records began	Comments
High records or near-records				
Kaitaia	267	164	1951	2nd-highest
Dunedin (Musselburgh)	243	145	1980	2nd-highest
Low records or near-records				
None observed				

Temperature: A mild month with pockets of below average temperatures.

Frequent cool westerly and southwesterly winds throughout the month kept temperatures mild during December despite the plentiful sunshine. Pockets of below average temperature (-1.20°C to -0.51°C of average) were observed in parts of Waikato, Taranaki, Wellington, Tasman and the West Coast while the remainder of the country experienced near average (-0.50 to +0.50°C of average) temperatures.

There were no temperature records set during December and only a handful of near-record low temperatures were observed as shown in the tables below. No high mean, mean minimum or mean maximum records or near-records were set during December, the only month of 2016 to have observed this.

The nationwide average temperature in December 2016 was 15.4°C (0.3°C below the 1981-2010 December average from NIWA's seven station temperature series which begins in 1909).

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

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
None observed				
Low records or near-records				
Takaka	14.2	-1.8	1978	3rd-lowest
Port Taharoa	16.4	-1.3	1973	4th-lowest

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
None observed				
Low records or near-records				
Port Taharoa	19.0	-2.1	1973	3rd-lowest
Takaka	19.4	-2.0	1978	3rd-lowest
Auckland (North Shore)	21.1	-0.8	1994	4th-lowest
Martinborough	20.6	-0.8	1986	4th-lowest

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

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
None observed				
Low records or near-records				
Whangaparaoa	13.7	-0.6	1982	4th-lowest
Te Kuiti	9.8	-1.9	1959	4th-lowest

December climate in the six main centres

December temperatures were near average for all of the main centres with the exception of Hamilton where below average temperatures were recorded. Rainfall was near normal in Wellington and above normal in Christchurch, while the remaining main centres saw well below normal rainfall. Despite above normal rainfall in Christchurch, sunshine was well above normal. Dunedin has its second sunniest December on record. Of the six main centres in December 2016, Wellington was the wettest, Auckland was the warmest and driest, Dunedin was the coolest, Tauranga was the sunniest and Christchurch was the least sunny.

December 2016 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland ^a	18.0	-0.2	Near average
Tauranga ^b	17.8	-0.2	Near average
Hamilton ^c	16.1	-0.8	Below average
Wellington ^d	15.2	-0.2	Near average
Christchurch ^e	15.7	-0.1	Near average
Dunedin ^f	14.1	+0.3	Near average
Rainfall			

Location	Rainfall (mm)	% of normal	Comments
Auckland ^a	33	39%	Well below normal
Tauranga ^b	44	47%	Well below normal
Hamilton ^c	48	46%	Well below normal
Wellington ^d	78	93%	Near normal
Christchurch ^e	56	120%	Above normal
Dunedin ^f	37	46%	Well below normal

Sunshine

Location	Sunshine (hours)	% of normal	Comments
Auckland ^a	223	113%	Above normal
Tauranga ^b	256	110%	Above normal
Hamilton ^g	205	99%	Near normal
Wellington ^d	196 ²	88%	Below normal
Christchurch ^e	177 ³	145%	Well above normal
Dunedin ^f	243	145%	Well above normal (2nd-highest on record)

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

Highlights and extreme events

Rain and slips

On 29 December, early morning rainfall about Kaikoura triggered minor rock falls and as a result, SH1 between Hundalee and Kaikoura was closed for a few hours as a precaution.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
None observed				

Temperatures

The highest temperature was 33.2°C, observed at Christchurch (Riccarton) on 21 December.

The lowest temperature was -1.2°C, observed at Hanmer Forest on 20 December.

On 8 December, southeast winds, or a reverse foehn effect, across the South Island allowed the West Coast region to be the warmest in the country. The nation's warm spot was Franz Josef where a maximum temperature of 25.8°C was recorded. Greymouth reached 25.5°C, making it the warmest day in the town in 678 days, or since January 30th 2015.

² 1 day missing

³ 3 days missing

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Tiwai Point	28.1	9th	1970	Equal 3rd-highest
Whatawhata	28.1	21st	1952	Equal 3rd-highest
Puysegur Point	22.9	14th	1978	Equal 4th-highest
Low records or near-records				
Secretary Island	11.8	19th	1989	Equal 4th-lowest

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Rangiora	20.0	15th	1972	3rd-highest
Cheviot	18.1	15th	1982	4th-highest
Low records or near-records				
Kaikoura (Middle Creek)	4.3	30th	1963	3rd-lowest

Wind

On 11 December, strong winds buffeted many parts of the country. In the very early morning hours, strong wind gusts flattened temporary fences and tore down tarpaulins at Blake Park, Tauranga where the set of the postponed Christmas in the Park was located, the event was eventually cancelled due to the high winds and safety concerns.

On 12 December a southerly change abruptly disrupted a summer's day in Wellington. Strong winds, including a 72 km/hr gust at Greta Point, led to increased wave action and caused a number of boats to capsize. According to a Wellington District Police report the Maritime Unit rescued 10 people after five small yachts were struck by the southerly wind.

On 14 December, strong winds through the Cook Strait meant that the cruise ship the *Dawn Princess* was unable to dock in Wellington Harbour and had to make its way to Napier instead.

The highest wind gust was 161 km/hr, observed at Akitio on 15 December.

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

Location	Extreme wind gust (km/hr)	Date of extreme gust	Year records began	Comments
Manapouri	80	27th	1991	Equal 3rd-highest
Secretary Island	113	9th	1994	4th-highest

Oamaru	82	23rd	1984	4th-highest
Castlepoint	148	18th	1972	Equal 4th-highest

Lightning and hail

On 23 December, a lightning strike caused a brief disturbance to Gisborne's power supply.

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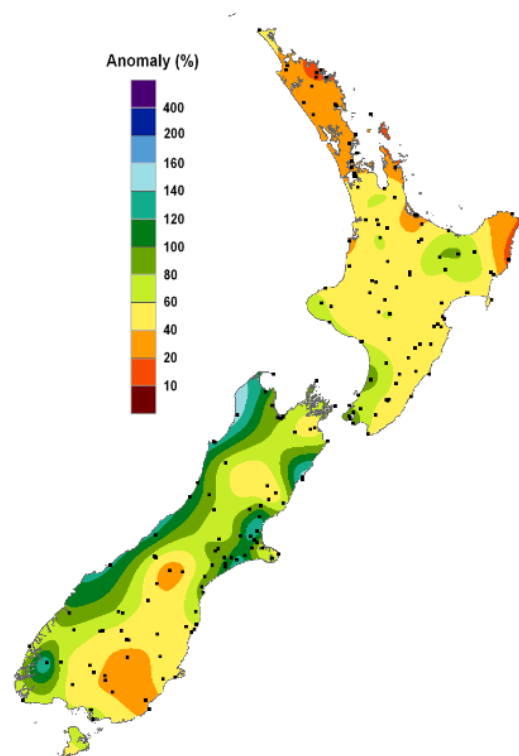
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December 2016 rainfall, expressed as a percentage of the 1981-2010 normal.

Rainfall was below normal (50-79% of normal) or well below normal (<50% of normal) for the majority of the country during December. The exceptions were the western fringes of Southland, the West Coast, Tasman and Wellington regions where rainfall was near normal (80-119% of normal). Above normal rainfall (120-149% of normal) was recorded at a handful of locations.

<https://www.niwa.co.nz/our-science/climate>

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