

## A dry month for much of New Zealand

<b>Temperature</b>	Mean temperatures for October were near average (-0.50 to +0.50°C) for nearly all locations across New Zealand. A small portion of Auckland observed mean temperatures slightly below average (-0.51 to -1.20°C), while a handful of locations around the country observed above average (+0.51 to +1.20°C) mean temperatures.
<b>Rainfall</b>	Rainfall in October was below normal (50-79% of normal) or well below normal (<50% of normal) across large swaths of New Zealand, particularly in the North Island and the western South Island. Meanwhile, near normal rainfall totals (80-119% of normal) were observed across northern Waikato and Bay of Plenty, as well as Canterbury, Otago, and interior Southland. In addition, areas of above normal (120-149% of normal) to well above normal (>149% of normal) rainfall were observed from northern Canterbury to Otago.
<b>Soil Moisture</b>	As of 1 November 2018, soil moisture levels were generally below normal for the time of year across much of Northland, parts of Auckland, western Waikato, Hawke's Bay to Wairarapa, and the upper South Island. Meanwhile, above normal soil moisture levels were found from central Canterbury to interior Southland. Soil moisture levels were generally near normal for the time of year across the rest of the country.

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### Overview

For the month as whole, October mean sea level pressure was higher than normal over and to the southwest of New Zealand, resulting in more southerly winds than normal over the country.

Rainfall in October was below normal (50-79% of normal) or well below normal (<50% of normal) across large swaths of New Zealand, particularly in the North Island and the western South Island. Meanwhile, near normal rainfall totals (80-119% of normal) were observed across northern Waikato and Bay of Plenty, as well as Canterbury, Otago, and interior Southland. In addition, areas of above normal (120-149% of normal) to well above normal (>149% of normal) rainfall were observed from northern Canterbury to Otago.

Mean temperatures for October were near average (-0.50 to +0.50°C) for nearly all locations across New Zealand. A small portion of Auckland observed mean temperatures slightly below average (-0.51 to -1.20°C), while a handful of locations around the country observed above average (0.51 to 1.20°C) mean temperatures.

The nationwide average temperature in October 2018 was 12.4°C (0.3°C warmer than the 1981-2010 October average from NIWA's seven station temperature series which begins in 1909).

**Further Highlights:**

- The highest temperature was 28.9°C, observed at Waiau on 24 October.
- The lowest temperature was -7.5°C, observed at Mt Cook Airport on 13 October.
- The highest 1-day rainfall was 108 mm, recorded at Haast on 10 October.
- The highest wind gust was 159 km/h, observed at Cape Turnagain on 10 October.
- Of the six main centres in October 2018, Auckland was the warmest, Christchurch was the coolest, Wellington was the wettest, Tauranga was the sunniest, and Dunedin was the driest and least sunny.
- Of the available, regularly reporting sunshine observation sites, the sunniest four regions in 2018 so far (1 January – 31 October) are Wider Nelson (2073 hours), Marlborough (2070 hours), Bay of Plenty (2029 hours) and Hawke's Bay (2000 hours).
- Of the available, regularly reporting low elevation rainfall sites, the two wettest locations in 2018 so far (1 January – 31 October) are Milford Sound (5937 mm) and Arthur's Pass (3731 mm). The two driest locations in 2018 so far are Alexandra (370 mm) and Clyde (400 mm).

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### **Rainfall: Dry for most areas, but wet in the eastern South Island**

High pressure was prominent during much of October, which resulted in rainfall totals that were below normal (50-79% of normal) or well below normal (<50% of normal) across large swaths of New Zealand, particularly in the North Island and the western South Island. Notably, Kerikeri observed only 49 mm of rain (38% of its normal October rainfall), while in the West Coast, Reefton observed 45 mm (23% of October normal). This was Reefton's 2<sup>nd</sup>-driest October on record, as it was in nearby Westport as well. However, no locations in New Zealand had their driest October on record.

Conversely, areas of above normal (120-149% of normal) to well above normal (>149% of normal) rainfall were observed from northern Canterbury to Otago in October. This was the result of significant rainfall that occurred during a couple of southerly changes during the month. Tara Hills observed 78 mm of rain in October (203% of October normal), while Lauder recorded 200% of its October normal rainfall. It was also a wet month in Christchurch, as the airport recorded 160% of October normal rainfall. Despite the wet month in the eastern South Island, no locations observed rainfall records or near-records.

As of 1 November 2018, soil moisture levels were generally below normal for the time of year across much of Northland, parts of Auckland, western Waikato, Hawke's Bay to Wairarapa, and the upper South Island. Meanwhile, above normal soil moisture levels were found from central Canterbury to

interior Southland. Soil moisture levels were generally near normal for the time of year across the rest of the country.

**Record<sup>1</sup> or near-record October rainfall totals were recorded at:**

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
<b>High records or near-records</b>				
None observed				
<b>Low records or near-records</b>				
Ohakune	35	25	1961	2nd-lowest
Westport	90	43	1944	2nd-lowest
Reefton	45	23	1960	2nd-lowest
Turangi	54	37	1968	3rd-lowest
Waiouru	31	30	1950	3rd-lowest
Arapito	115	50	1978	3rd-lowest
Greymouth	96	43	1947	3rd-lowest
Arthurs Pass	148	28	1906	Equal 4th-lowest

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### Temperature: Near average temperatures for most of New Zealand

The nationwide average temperature in October 2018 was 12.4°C (0.3°C warmer than the 1981-2010 October average from NIWA’s seven station temperature series which begins in 1909).

Mean temperatures for October were near average (-0.50 to +0.50°C) for nearly all locations across New Zealand. A small portion of Auckland observed mean temperatures slightly below average (-0.51 to -1.20°C), while a handful of locations around the country observed above average (+0.51 to +1.20°C) mean temperatures.

In the North Island, several locations recorded record or near-record high mean maximum (daytime) temperatures in October, notably Rotorua where maximum daytime temperatures were 2.1°C above average, the highest on record for October. However, these warm daytime temperatures were offset by generally cool nights, thanks to prevalent high pressure which allowed for clear skies and light winds (known as radiational cooling). In fact, Warkworth observed its record low mean minimum (nighttime) temperature for October (2.6°C below average).

No mean temperature records or near-records were observed across New Zealand in October.

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<sup>1</sup> The rankings (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>.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.

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

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
None observed				
<b>Low records or near-records</b>				
None observed				

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Rotorua	18.2	2.1	1964	Highest
Turangi	18.0	1.8	1968	Equal highest
Whitianga	20.2	1.9	1962	2nd-highest
Motu	16.9	2.3	1990	2nd-highest
Hamilton	19.7	1.7	1906	3rd-highest
Mokohinau	17.8	0.9	1994	4th-highest
Whangaparaoa	18.6	0.8	1982	4th-highest
Taupo	18.6	2.8	1949	4th-highest
Farewell Spit	17.7	1.0	1971	4th-highest
<b>Low records or near-records</b>				
None observed				

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

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
None observed				
<b>Low records or near-records</b>				
Warkworth	6.9	-2.6	1966	Lowest
Kaikoura	5.1	-3.1	1963	2nd-lowest
Whangarei	8.1	-2.1	1967	3rd-lowest
Turangi	4.4	-2.0	1968	3rd-lowest
Te Kuiti	6.4	-1.8	1959	4th-lowest
Taumarunui	5.3	-2.0	1947	4th-lowest

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## October climate in the six main centres

Of the six main centres in October 2018, Auckland was the warmest, Christchurch was the coolest, Wellington was the wettest, Tauranga was the sunniest, and Dunedin was the driest and least sunny.

## October 2018 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland <sup>a</sup>	14.4	0.0	Near average
Tauranga <sup>b</sup>	14.3	+0.2	Near average
Hamilton <sup>c</sup>	12.7	-0.3	Near average
Wellington <sup>d</sup>	12.6	+0.6	Above average
Christchurch <sup>e</sup>	11.2	-0.2	Near average
Dunedin <sup>f</sup>	11.5	+0.6	Above average

Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland <sup>a</sup>	74	81	Near normal
Tauranga <sup>b</sup>	79	88	Near normal
Hamilton <sup>c</sup>	78	79	Below normal
Wellington <sup>d</sup>	114	97	Near normal
Christchurch <sup>e</sup>	78	160	Well above normal
Dunedin <sup>f</sup>	55	90	Near normal

Sunshine	
Location	Sunshine (hours)
Auckland <sup>a</sup>	205
Tauranga <sup>b</sup>	240
Hamilton <sup>g</sup>	205
Wellington <sup>d</sup>	193
Christchurch <sup>e</sup>	209
Dunedin <sup>f</sup>	181

<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

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## Highlights and extreme events

### Temperatures

On 10 October, a winter-like southerly change pushed up the South Island, causing temperature drops of 6 to 7°C in one hour in Timaru, Lauder, and Dunedin.

On 19 October, the relative humidity dipped to 28% in Wellington (Greta Point). The relative humidity typically drops below 30% approximately once per year in the capital. En route to Wellington, air parcels passed over the interior South Island and Alps, resulting in unusual dryness.

On 24 October, unseasonable warmth peaked in the lee of the Southern Alps due to a foehn northwest flow. Several locations observed near-record warmth while the temperature at Hanmer Forest reached 28.6°C, its warmest October temperature on record.

The highest temperature was 28.9°C, observed at Waiau on 24 October.

The lowest temperature was -7.5°C, observed at Mt Cook Airport on 13 October.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
<b>High records or near-records</b>				
Hanmer Forest	28.6	24th	1906	Highest
Mt Cook (Airport)	26.1	23rd	1929	Highest
Manapouri	24.0	22nd	1963	Highest
Whitianga	24.5	20th	1962	2nd-highest
Reefton	26.0	22nd	1960	2nd-highest
Cheviot	28.8	24th	1982	2nd-highest
Lake Tekapo	25.4	23rd	1925	2nd-highest
Tara Hills	27.2	23rd	1949	2nd-highest
Five Rivers	24.0	22nd	1982	Equal 2nd-highest
Rotorua	22.9	23rd	1964	3rd-highest
Waiau	28.9	24th	1974	3rd-highest
Ranfurlly	25.5	23rd	1897	3rd-highest
Manapouri	21.9	22nd	1971	3rd-highest
Cromwell	28.5	23rd	1949	3rd-highest
Wanaka	25.9	23rd	1955	Equal 3rd-highest
Taupo	24.1	23rd	1949	4th-highest
Lumsden	23.8	21st	1982	4th-highest
Clyde	27.4	21st	1978	4th-highest
Te Anau	22.5	22nd	1963	Equal 4th-highest
<b>Low records or near-records</b>				
Puysegur Point	7.6	10th	1978	Lowest
Invercargill	5.8	10th	1905	Lowest
Tiwai Point	6.9	10th	1972	Lowest
Mt Cook	1.1	12th	1929	Equal lowest
Waipara	5.6	12th	1973	Equal lowest
Cheviot	7.1	12th	1982	2nd-lowest
Five Rivers	6.4	12th	1982	Equal 2nd-lowest
Hanmer Forest	4.1	12th	1972	3rd-lowest
Akaroa	7.4	12th	1978	3rd-lowest
Waiau	6.6	12th	1974	4th-lowest
Rangiora	7.6	12th	1972	4th-lowest
Le Bons Bay	5.9	12th	1984	4th-lowest

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
<b>High records or near-records</b>				
Puysegur Point	15.1	24th	1978	Highest
Balclutha	14.0	24th	1972	Highest
South West Cape	12.7	24th	1991	Highest
Wanaka	15.0	24th	1972	2nd-highest
Manapouri	11.9	24th	1972	2nd-highest
Nugget Point	13.2	24th	1972	2nd-highest
Secretary Island	13.0	24th	1988	Equal 3rd-highest
Te Anau	12.9	24th	1973	Equal 3rd-highest
<b>Low records or near-records</b>				
Turangi	-4.1	19th	1968	Lowest
Upper Hutt	-4.6	19th	1939	Lowest
Takaka	-0.5	13th	1978	Lowest
Arapito	-0.8	13th	1978	Lowest
Mt Cook (Airport)	-7.5	13th	1929	Lowest
Queenstown	-4.2	13th	1871	Lowest
Clyde	-3.4	13th	1978	Lowest
Warkworth	1.1	14th	1966	2nd-lowest
Dannevirke	-3.4	19th	1951	2nd-lowest
Martinborough	-1.5	19th	1986	2nd-lowest
Greymouth	0.4	13th	1947	2nd-lowest
Brothers Island	4.5	13th	1997	2nd-lowest
Manapouri	-4.6	13th	1963	2nd-lowest
Waipawa	-2.5	19th	1945	3rd-lowest
Rotorua	-1.6	14th	1964	4th-lowest
Masterton	-3.3	19th	1906	4th-lowest
Motu	-3.2	14th	1990	Equal 4th-lowest
Wanaka	-2.8	13th	1955	Equal 4th-lowest
Tiwai Point	0.3	11th	1970	Equal 4th-lowest

**Rain and slips**

On 12 October, heavy rain contributed to surface flooding along State Highway 1 between Wellington central and Ngauranga.

On 24 October, water restrictions were put into place in Masterton due to low spring rainfall. Residents were not allowed to use hand held hoses because the water supply from the Waingawa River was running low.

On 24 October, Christchurch residents were asked to conserve water by only using hand-held hoses (not sprinklers) and only watering between 9pm and 7am.

The highest 1-day rainfall was 108 mm, recorded at Haast on 10 October.

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

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

### Wind

On 10 October, strong winds forced the suspension of an air search for a man who fell overboard from a fishing vessel near Wairarapa.

On 12 October, the Interislander cancelled seven ferry sailings because of expected severe wind and sea conditions in the Cook Strait.

On 29 October, a tornado touched down near Ruakura in central Waikato just before 1 pm, generally moving through farmland. It swept up soil, lifted large sheets of corrugated iron, a trampoline, and other light items.

The highest wind gust was 159 km/h, observed at Cape Turnagain on 10 October.

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

Location	Extreme wind gust (km/h)	Date of extreme gust	Year records began	Comments
Waiouru	106	27th	1970	Equal highest
Mt Kaukau	139	12th	1969	2nd-highest
Brothers Island	137	12th	1997	3rd-highest
Oamaru	85	10 <sup>th</sup> & 12 <sup>th</sup>	1984	Equal 4th-highest

### Snow and Ice

On 10 October, an icy southerly change moved up the South Island, delivering snow to as low as 200 metres in Southland and Otago. State Highway 94 from Te Anau was closed due to several centimetres of settled snow. The Milford Road was closed from Hollyford to Chasm due to an avalanche risk.

### Cloud and Fog

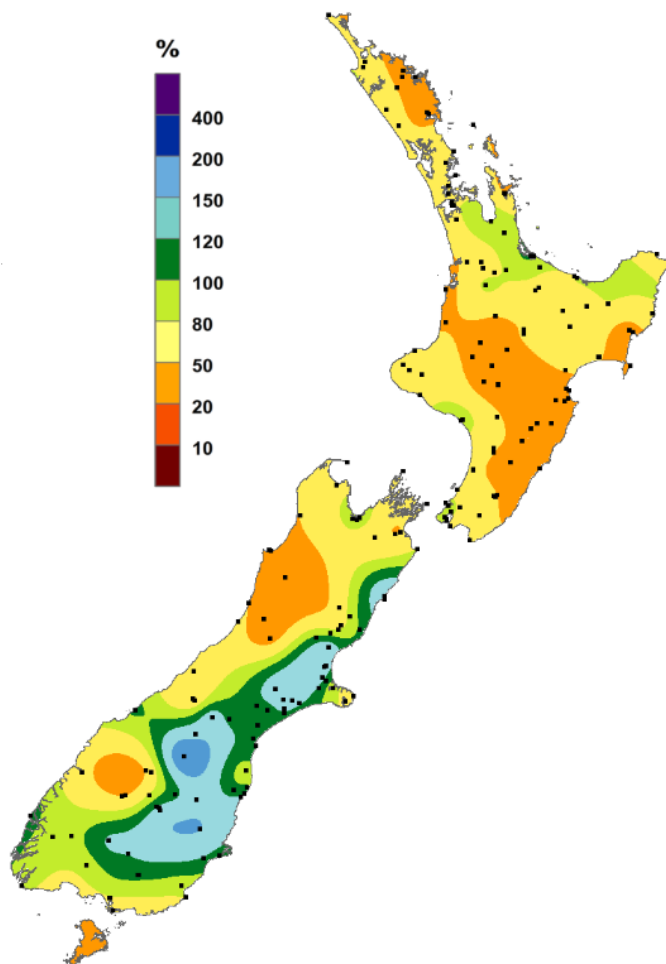
On the morning of 2 October, dense fog blanketed Christchurch, causing widespread delays and cancellations at Christchurch Airport.

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### For further information and climate data enquiries, please contact:

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*October 2018 total rainfall, expressed as a percentage of normal (1981-2010 normal).*

*October rainfall was below or well below normal for much of the North Island and the western South Island.*

*In contrast, above to well above normal rainfall was observed in parts of the eastern South Island.*

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