

## A very dry and warm month for the South Island interior

<b>Rainfall</b>	Rainfall was well below normal (<50% of normal) for most of Otago as well as parts of Northland, Gisborne, Kapiti Coast, Marlborough, southern Canterbury, and Southland. Rainfall was below normal (50-79% of normal) for parts of Northland, Auckland, Manawatu-Whanganui, Wellington, Wairarapa, Canterbury and Southland. Rainfall was well above normal (>149% of normal) for parts of western Bay of Plenty, Waikato, the east coast of the South Island, West Coast, and Fiordland. Rainfall was above normal (120-149% of normal) or near normal (80-119% of normal) elsewhere.
<b>Temperature</b>	Temperatures were well above average (>1.20°C of average) in parts of Auckland, Coromandel, Manawatu-Whanganui, Kapiti Coast, Nelson, Canterbury, Otago, Southland, and Fiordland. Temperatures were above average (0.51-1.20°C above average) for most of the rest of the country, except for some eastern coastal areas of both Islands that recorded near (-0.50°C to +0.50°C of average) or below (-1.20°C to -0.50°C of average) average temperatures.
<b>Sunshine</b>	Sunshine was well above normal (>125% of normal) or above normal (110-125% of normal) for Otago and Southland as well as parts of the Wellington and Taranaki regions. Sunshine was near normal (90-110% of normal) for most other parts of the country, except for Auckland and parts of Northland where sunshine was below normal (75-89% of normal).
<b>Soil Moisture</b>	As at 1 November, soils were much drier than normal for the time of year for interior Otago and interior Southland, Tasman, Kapiti Coast, Taranaki, Gisborne, and Northland. Soils were wetter than normal for the time of year in Bay of Plenty, eastern Waikato, and the east coast of the South Island.

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### Overview

October 2017 was characterised by higher than normal sea level pressure over New Zealand and the surrounding seas. This consistent high pressure resulted in settled, warm conditions over much of the country during the month, but this was occasionally punctuated with rainfall events, particularly in the east of both North and South Islands.

The focus of the month was the extremely dry conditions in Otago and Southland. Only a few millimetres of rain fell in some parts of Otago during the whole month. Dry conditions were

experienced elsewhere too, particularly in southern Canterbury, Kapiti Coast, and Gisborne. This resulted in soils being much drier than normal for the time of year in these locations, which could be of concern heading into the driest part of the year.

It was a warm month for much of the country. Extreme warmth was experienced in Central Otago and Southland on a couple of days during the month, which resulted in several records or near-records for October.

Due to the limited rainfall in the southern South Island, it was a sunny month there. Most areas recorded near normal sunshine hours. It was a cloudy October in the northern North Island, however.

Further Highlights:

- The highest temperature was 30.0°C, observed at Cromwell on 20 October.
- The lowest temperature was -3.0°C, observed at Mt Cook Airport on 6 October.
- The highest 1-day rainfall was 89.8 mm, recorded at Takaka on 7 October.
- The highest wind gust was 152 km/hr, observed at Akitio on 22 October.
- Of the six main centres in October 2017, Auckland was the warmest and least sunny, Dunedin was the coldest, driest, and sunniest, and Tauranga was the wettest.
- Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2017 so far (1 January – 31 October) are Blenheim (2039 hours), Richmond (2037 hours), Whakatane (2028 hours) and Napier (1978 hours).

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## Rainfall: Extremely dry for parts of Otago

The consistent passage of high pressure systems over the country caused very dry conditions for parts of interior Otago. Wanaka, Queenstown, Cromwell and Clyde all recorded less than 6 mm of rain for the entire month, making October 2017 their second-driest October on record. Wanaka recorded only 4% of normal October rainfall (3 mm for the month). For Queenstown, this was the 2<sup>nd</sup>-driest October since records began in 1871, a mere 6% of the October normal. Queenstown experienced a 30-day dry spell (less than 1 mm of rain on any day) ending on 25 October, its longest dry spell since a 33-day stretch in February-March 2013. Mt Cook Airport and Manapouri recorded their driest October on record. In contrast, Waipara West recorded its 2<sup>nd</sup>-highest October rainfall total.

Rainfall was well above normal (>149% of normal) for parts of western Bay of Plenty, Waikato, the east coast of the South Island, West Coast, and Fiordland. Rainfall was above normal (120-149% of normal) or near normal (80-119% of normal) elsewhere.

As at 1 November, soils were much drier than normal for the time of year for interior Otago and interior Southland, Tasman, Kapiti Coast, Taranaki, Gisborne, and Northland. Soils were wetter than normal for the time of year in Bay of Plenty, eastern Waikato, and the east coast of the South Island.

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

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
High records or near-records				
Waipara West	111	283	1973	2nd-highest
Low records or near-records				
Mt Cook Airport	69	16	1928	Lowest
Manapouri	24	23	1961	Lowest
Stratford	60	28	1960	2nd-lowest
Wanaka	3	4	1927	2nd-lowest
Queenstown	5	6	1871	2nd-lowest
Cromwell	6	18	1949	2nd-lowest
Clyde	6	17	1978	2nd-lowest
Paraparaumu	41	35	1945	3rd-lowest
Levin	40	38	1895	4th-lowest
Balclutha	28	47	1964	4th-lowest

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## Temperature: Above average for most of the country

The nationwide average temperature in October 2017 was 13.0°C (1.0°C above the 1981-2010 October average from NIWA's seven station temperature series which begins in 1909). October 2017 was the 10<sup>th</sup>-warmest October, and August-October 2017 was the warmest-equal August-October period (equal with 1988) on record for New Zealand using the seven-station series.

October temperatures were well above average (>1.20°C of the October average) for parts of Auckland, Coromandel, Manawatu-Whanganui, Kapiti Coast, Nelson, Canterbury, Otago, Southland, and Fiordland, also including many places in the table below that observed record or near-record high mean temperatures. Temperatures were above average (0.51-1.20°C above the October average) for most of the rest of the country, except for some eastern coastal areas of both Islands that recorded near (-0.50°C to +0.50°C of the October average) or below average (-1.20°C to -0.50°C of the October average) temperatures.

Consistent with record- and near-record high mean temperatures for many locations, record- and near-record high mean maximum (day time) and mean minimum (night time) temperatures were also experienced. Notably, Cromwell experienced a mean maximum temperature of 22.1°C for the month, which was 4.5°C above average for October – similar to the mean maximum temperature usually expected there in December (22.5°C). Extreme high maximum temperatures were recorded in many locations on a number of days during the month, particularly in the South Island – see the *Highlights and Extreme Events* section for more details.

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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>				
Te Anau	11.0	1.5	1963	Highest
Auckland (Whenuapai)	14.9	1.2	1945	2nd-highest
Whitianga	15.7	1.8	1962	2nd-highest
Masterton	13.8	1.7	1906	2nd-highest
Puysegur Point	11.4	1.3	1978	2nd-highest
Queenstown	12.6	2.2	1871	2nd-highest
Cromwell	13.9	2.6	1949	2nd-highest
Lauder	12.2	2.2	1924	2nd-highest
Whangarei	15.9	1.2	1967	3rd-highest
Takaka	13.0	0.8	1978	3rd-highest
Farewell Spit	14.4	1.3	1971	3rd-highest
Arapito	13.3	1.3	1978	3rd-highest
Secretary Island	11.6	0.7	1985	3rd-highest
Richmond	14.2	1.7	1862	3rd-highest
Tara Hills	11.5	1.7	1949	3rd-highest
Ranfurly	10.6	1.5	1897	3rd-highest
Ngawi	14.7	1.0	1972	4th-highest
Wellington (Kelburn)	13.3	1.3	1927	4th-highest
Hawera	12.9	1.0	1977	4th-highest
<b>Low records or near-records</b>				
Oamaru	8.7	-1.8	1967	2nd-lowest

**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>				
Puysegur Point	14.1	1.5	1978	Highest
Wanaka	18.7	2.4	1955	Highest
Queenstown	18.8	2.9	1871	Highest
Lumsden	17.0	1.8	1982	Highest
Cromwell	22.1	4.5	1949	Highest
Clyde	20.7	3.0	1978	Highest
Ngawi	18.3	1.5	1972	2nd-highest
Five Rivers	16.9	1.7	1982	2nd-highest
Lauder	19.4	3.3	1924	2nd-highest
Takaka	18.8	1.0	1978	3rd-highest
Milford Sound	16.3	1.2	1934	3rd-highest
Manapouri (West Arm Jetty)	15.1	2.0	1971	3rd-highest
Manapouri (Airport)	16.4	1.5	1963	3rd-highest
Paraparaumu	17.3	1.5	1953	4th-highest

Wellington (Kelburn)	16.6	1.7	1927	4th-highest
Wellington (Airport)	16.9	1.1	1962	4th-highest
Te Anau	16.4	1.5	1963	4th-highest
<b>Low records or near-records</b>				
Oamaru	13.1	-2.1	1967	3rd-lowest

**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>				
Auckland (Whenuapai)	11.9	2.2	1945	Highest
Whitianga	12.0	2.4	1962	Highest
Kaitaia	12.2	1.3	1948	2nd-highest
Dargaville	12.4	1.3	1943	2nd-highest
Hawera	9.8	1.4	1977	2nd-highest
Whanganui	11.3	1.7	1937	2nd-highest
Farewell Spit	11.2	1.6	1971	2nd-highest
Whangarei	12.4	1.7	1967	3rd-highest
Auckland (Western Springs)	11.8	1.3	1948	3rd-highest
Nelson	9.8	1.6	1862	3rd-highest
Whatawhata	10.9	1.9	1952	4th-highest
Port Taharoa	12.1	1.3	1973	4th-highest
Palmerston North	10.1	1.7	1928	4th-highest
Arapito	9.4	1.7	1978	4th-highest
Puysegur Point	8.6	1.0	1978	4th-highest
Akaroa	8.4	1.4	1978	4th-highest
<b>Low records or near-records</b>				
Kaikoura	5.9	-2.3	1963	3rd-lowest

## Sunshine: A sunny month in the far south

It was a sunny October in southern South Island, with Queenstown and Gore experiencing their sunniest October on record. Dunedin, Cromwell and Invercargill also experienced near-record high sunshine for the month. Most of these locations recorded well above normal sunshine for October 2017 (>125% of the October normal).

Sunshine was also above normal (110-125% of the October normal) for parts of the western North Island, and near normal (90-100% of the October normal) for most other parts of New Zealand. In contrast, the upper North Island recorded below (75-89% of the October normal) or well below (<75% of the October normal) normal sunshine for October – Mangere in Auckland experienced its least sunny October on record with only 73% of normal sunshine hours.

Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2017 so far (1 January – 31 October) are Blenheim (2039 hours), Richmond (2037 hours), Whakatane (2028 hours) and Napier (1978 hours).

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

Location	Sunshine hours	Percentage of normal	Year records began	Comments
<b>High records or near-records</b>				
Queenstown	264	134	1930	Highest
Gore	234	145	1941	Highest
Paraparaumu	236	132	1953	3rd-highest
Upper Hutt	219	128	1939	3rd-highest
Dunedin (Musselburgh)	226	135	1980	3rd-highest
Cromwell	267	123	1979	4th-highest
Invercargill	227	131	1913	4th-highest
<b>Low records or near-records</b>				
Auckland (Mangere)	129	73	1963	Lowest

## October climate in the six main centres

October was a warm month for all the main centres, with well above average temperatures observed in Wellington and above average temperatures elsewhere. Rainfall was mixed, with well below normal rainfall for Dunedin, below normal rainfall for Auckland and Wellington, near normal rainfall for Hamilton, above normal rainfall for Christchurch, and well above normal rainfall for Tauranga. It was a sunny month for Dunedin and Wellington, but a cloudy month for Auckland.

Of the six main centres in October 2017, Auckland was the warmest and least sunny, Dunedin was the coldest, driest, and sunniest, and Tauranga was the wettest.

### October 2017 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland <sup>a</sup>	15.4	1.0	Above average
Tauranga <sup>b</sup>	14.9	0.8	Above average
Hamilton <sup>c</sup>	13.7	0.7	Above average
Wellington <sup>d</sup>	13.3	1.3	Well above average
Christchurch <sup>e</sup>	12.0	0.6	Above average
Dunedin <sup>f</sup>	11.7	0.8	Above average
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland <sup>a</sup>	60	65	Below normal
Tauranga <sup>b</sup>	162	182	Well above normal
Hamilton <sup>c</sup>	105	107	Near normal
Wellington <sup>d</sup>	65	55	Below normal
Christchurch <sup>e</sup>	69	141	Above normal
Dunedin <sup>f</sup>	28	46	Well below normal
Sunshine			
Location	Sunshine (hours)	% of normal	Comments
Auckland <sup>a</sup>	129	73	Well below normal (lowest)
Tauranga <sup>b</sup>	206	97	Near normal
Hamilton <sup>g</sup>	160	91	Near normal
Wellington <sup>d</sup>	217	113	Above normal
Christchurch <sup>e</sup>	211	103	Near normal
Dunedin <sup>f</sup>	226	135	Well above normal (3 <sup>rd</sup> highest)

<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

### Rain and slips

On 12 October, heavy rain caused 31 slips on the newly reopened Kaikoura railway line and coastal road, closing it for three weeks.

On 15 October, a heavy downpour associated with a southerly change caused surface flooding on the Wellington urban motorway. As a result speed limits were reduced to 60 km/hr.

On 18 October, heavy rain and hail caused the abandonment of the Dannevirke Bowling Club's first major tournament of the season.

The highest 1-day rainfall was 89.8 mm, recorded at Takaka on 7 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
Waipara West	37	7th	1973	3rd-highest

### Temperatures

Numerous episodes of Foehn winds (where dry air warms as it travels downslope in the lee or downwind side of mountain ranges, e.g. the Southern Alps) occurred during October, causing records and near-records for extreme maximum October temperatures to be set.

Foehn winds caused by low pressure in the Tasman Sea brought record warm temperatures to the West Coast on 8-9 October.

On 19 and 20 October, a warm northwest Foehn wind caused very warm temperatures in the Otago region, with a few locations exceeding 30°C. Cromwell recorded 28.6°C on the 19<sup>th</sup> and 30.0°C on the 20<sup>th</sup>. The temperature on the 19<sup>th</sup> set a new October record and then this new record was beaten the next day. The 30.0°C reading on the 20<sup>th</sup> was also the first time a temperature of 30.0°C or greater was observed in Cromwell between the months of April and October and thus was the warmest temperature on record during those months.

On 30 October, another northwest Foehn episode brought warm temperatures to Southland and Otago. Invercargill recorded its highest October temperature on record (25.9°C), where records begin in 1905.

The highest temperature was 30.0°C, observed at Cromwell on 20 October. The lowest temperature was -3.0°C, observed at Mt Cook Airport on 6 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>				
Haast	23.3	8th	1949	Highest
Milford Sound	24.1	8th	1934	Highest
Puysegur Point	22.1	30th	1978	Highest
Mt Cook	25.2	19th	1929	Highest
Five Rivers	25.8	19th	1982	Highest
Cromwell	30.0	20th	1949	Highest
Invercargill	25.9	30th	1905	Highest
Tiwai Point	23.7	30th	1970	Highest
South West Cape	21.8	30th	1991	Highest
Westport	21.4	9th	1937	2nd-highest
Ranfurlly	25.8	20th	1897	2nd-highest
Te Anau	22.8	31st	1963	2nd-highest
Manapouri (West Arm Jetty)	22.6	31st	1971	2nd-highest
Lumsden	24.5	29th	1982	2nd-highest
Lauder	27.3	19th	1924	2nd-highest
Clyde	28.6	20th	1978	2nd-highest
Whitianga	23.5	14th	1962	3rd-highest
Tara Hills	26.3	20th	1949	3rd-highest
Roxburgh	27.3	20th	1950	3rd-highest
Hanmer Forest	27.2	20th	1906	4th-highest
Wanaka	25.7	20th	1955	4th-highest
Martinborough	24.8	31st	1986	Equal 4th-highest
Alexandra	28.2	20th	1928	Equal 4th-highest
<b>Low records or near-records</b>				
Oamaru	8.3	25th	1972	Equal 4th-lowest

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
<b>High records or near-records</b>				
Secretary Island	14.3	31st	1988	Highest
South West Cape	12.0	30th	1991	Equal highest
Wellington (Kelburn)	14.8	30th	1931	2nd-highest
Wellington (Airport)	15.7	30th	1972	2nd-highest
Paraparaumu	15.2	30th	1972	3rd-highest
Farewell Spit	14.0	29th	1972	Equal 3rd-highest
Haast	13.8	9th	1949	Equal 3rd-highest
Cape Reinga	15.1	30th	1971	Equal 4th-highest
<b>Low records or near-records</b>				
None observed				

## Wind

On 1 October, strong winds and heavy rain caused delays at the New Zealand Women's Open near Auckland, meaning that the event had to continue into a fifth day to complete 72 holes of golf. Hoardings flew across the course and a Sky Television contractor fell down a bank due to the wind.

On 2 October, strong winds with up to 110 km/hour gusts affected the Auckland and Waikato regions. Power was cut to Silverdale and Waitoki, north of Auckland. In Dunedin, power was cut to almost 900 customers on the Otago Peninsula after severe winds damaged power lines and trees.

The highest wind gust was 152 km/hr, observed at Akitio on 22 October.

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

Location	Extreme wind gust (km/hr)	Date of extreme gust	Year records began	Comments
Kaikohe	104	1st	1986	Highest
Cape Reinga	135	2nd	1974	Equal 3rd-highest
Whitianga	76	2nd	1991	4th-highest

## Lightning and hail

On 11 October, Christchurch residents were woken by a thunderstorm that caused 21 lightning strikes in less than an hour. Power was briefly cut to over 3100 homes in Clifton, Redcliffs, and Sumner. New Plymouth was also hit by lightning, with a strike in the suburb of Fitzroy leaving 4000 properties without power for a time.

On 14 October, an Air New Zealand plane was struck by lightning near Dunedin. This same storm caused about 50 lightning strikes near Dunedin, hail, and heavy rain for the city. The storm also disrupted lights at Forsyth Barr Stadium during a rugby game and caused brief power outages for some residents.

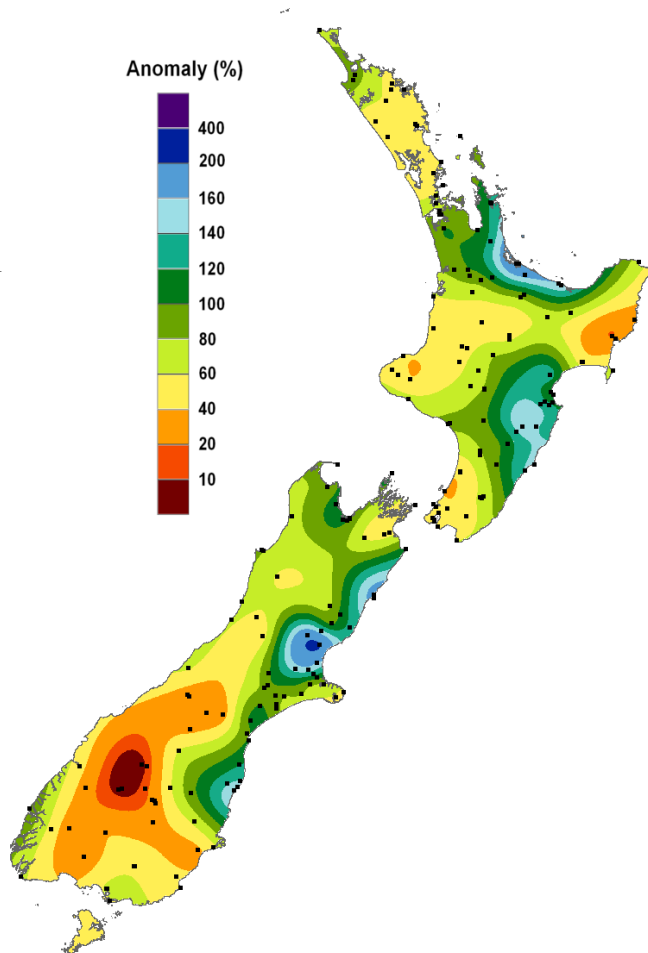
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October 2017 rainfall, expressed as a percentage of normal (1981-2010 normal).

Very little rain fell in Central Otago and Queenstown-Lakes Districts (less than 6 mm in some locations). It was a dry month across much of the interior South Island as well as Kapiti Coast, Gisborne, Taranaki, and Northland. In contrast, it was a wet month for Bay of Plenty and eastern parts of the South Island.

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