NIWA National Climate Centre

Monthly Climate Summary

NIWA Taihoro Nukurangi

New Zealand Climate Summary: **October 2016** Issued: 3 November 2016

A wet month for parts of the South Island and eastern North Island, warm in most locations.

Rainfall	October rainfall was generally above normal (120-149%) or well above normal (> 149%) for much of the southern South Island, including Otago, Southland, southern Canterbury and southern Westland, in addition to Nelson, eastern Tasman, western Marlborough, coastal Gisborne and northern Hawke's Bay, and eastern Bay of Plenty. Rainfall was generally near normal (80-119%) or below normal (50-79%) for much of the remainder of the North Island and the central South Island north of Otago. However, rainfall was well below normal (< 50%) in coastal Wairarapa and isolated parts of the far North.
Temperature	October temperatures were above average (+0.50°C to +1.20°C) throughout much of New Zealand. Temperatures were generally near average (-0.50 to +0.50°C) from western Northland to western Waikato, central Bay of Plenty, and from Tasman to central Otago.
Sunshine	October sunshine was below normal (75-89%) or well below normal (< 75%) in parts of the south-western North Island, central Canterbury and central Otago, whereas above normal (110-125%) sunshine was observed in western Northland, western Waikato, and parts of Westland. In addition, well above normal (> 125%) sunshine was experienced in far northern Northland.
Soil Moisture	At the end of October 2016, soil moisture levels were much lower than normal for the time of year in coastal northern Canterbury and coastal Wairarapa. Soil moisture levels were above normal for the time of year in much of Gisborne and northern Hawke's Bay, Nelson, eastern Tasman, western Marlborough, and Fiordland east to coastal Otago. Soil moisture levels were near normal for the remainder of the country.

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Overview

During October 2016, mean sea-level pressures were much lower than normal over and to the southwest of New Zealand, which resulted in a prevalence of winds from a westerly direction. However, several storms during the month took shape south and east of the country, which resulted in periods of southerly and easterly wind flows as well.

Despite the prevalence of westerly winds in October, several storms passing to the south and east of New Zealand led to wetter than normal conditions in the southern and northern South Island as well as the north-eastern North Island. Some parts of Otago received more than double their normal October rainfall, while much of the rest of the southern South Island recorded well above normal (> 149%) or above normal (120-149%) rainfall. The northern South Island also had a small area with very wet conditions, as Nelson received 204% of its normal October rainfall amount. Several storms moving east of the North Island delivered plentiful rainfall to Gisborne, Hawke's Bay and central Bay of Plenty, with Wairoa receiving 205% of its normal October rainfall. However, these storms did not aid coastal Wairarapa which received below normal (50-79%) to well below normal (< 50%) rainfall totals. Northern Northland was also dry in October, with Kerikeri only receiving 45% of its normal rainfall total.

October temperatures were average (-0.50°C to +0.50°C) to above average (+0.51°C to +1.20°C) throughout most of New Zealand. The above average temperatures in the southern South Island were aided by warm nights associated with plentiful cloud cover, which act to insulate the land and prevent heat from escaping into the atmosphere.

The nationwide average temperature in October 2016 was 12.8°C (0.67°C above the 1981-2010 October average from NIWA's seven station temperature series which begins in 1909[1]).

At the end of October 2016, soil moisture levels were much lower than normal for the time of year in coastal northern Canterbury and coastal Wairarapa. Soil moisture levels were above normal for the time of year in much of Gisborne and northern Hawke's Bay, Nelson, eastern Tasman, western Marlborough, and Fiordland east to coastal Otago. Soil moisture levels were near normal for the remainder of the country.

Cloudy skies associated with higher than normal rainfall totals meant that October sunshine was below normal (75-89%) or well below normal (< 75%) in parts of the south-western North Island, central Canterbury and central Otago, whereas above normal (110-125%) sunshine was observed in western Northland, western Waikato, and parts of Westland, which resulted from periods of easterly winds that caused sinking motion and increased sunshine on the western coasts of both islands. In addition, well above normal (> 125%) sunshine was experienced in far northern Northland.

Further Highlights:

- The highest temperature was 27.1 °C, observed at Christchurch (Riccarton) on 19 October and at Wairoa on 20 October.
- The lowest temperature was -3.8 °C, observed at Mt Cook Airport on 22 October.
- The highest 1-day rainfall was 160 mm, recorded at Milford Sound on 18 October.
- The highest wind gust was 180 km/hr, observed at Cape Turnagain on 5 October.
- Of the six main centres in October 2016, Auckland was the warmest, Tauranga was the sunniest and driest, Wellington was the wettest, Dunedin was the coolest, and Hamilton was the cloudiest.

[1] Interim value.

- Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2016 so far (1 January – 31 October) were Richmond (2318 hours), Blenheim (2107 hours), Takaka (2061 hours) and New Plymouth (2020 hours).

For further information, please contact:
Mr Chris Brandolino
Principal Scientist – Forecasting, NIWA National Climate Centre
Tel. 09 375 6335, Mobile 027 886 0014

Rainfall: Very wet for much of the South Island and part of the North Island

October was a very wet month in the southern and northern South Island and in the north-eastern North Island. Although few locations observed near-record high rainfall for October (only two locations, as per the table below), many sites recorded above normal (120-149%) or well above normal (> 149%) rainfall for the month in these parts of New Zealand. In fact, Ranfurly in Otago, Wairoa in Hawke's Bay, and Nelson all received more than 200% of their normal October rainfall. These heavy rain amounts were caused by several storms that moved to the south and east of the country during the month, and whose onshore winds produced ample moisture.

Conversely, a couple of areas of New Zealand recorded very low rainfall in October. Although there were no low rainfall records or near-records, coastal Wairarapa was once again very dry, as it received below normal (50-79%) to well below normal (< 50%) rainfall totals. In fact, Castlepoint received only 39% of its normal October rainfall. Northern Northland was also dry in October, with Kerikeri only receiving 45% of its normal rainfall total.

Record[2] 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				
Ranfurly	86	235	1943	3rd-highest
Alexandra	50	141	1983	4th-highest
Low records or near-records				
No records observed				

[2] 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.

Temperature: Average to slightly above average for most locations

October 2016 featured mostly average (-0.50°C to +0.50°C) to slightly above average (+0.50°C to +1.20°C) temperatures for the vast majority of New Zealand. While no October mean temperature records were set, a few locations observed near record high mean temperatures. Several locations in the southern South Island also saw high mean minimum temperature near-records in October (seen in the third table below). This was caused by the significant amount of cloud cover in that region, which acts to insulate the land and prevents heat from escaping into the atmosphere at night. Another contribution to the warmer than average temperatures in October was the warmer than average sea surface temperatures that were present around New Zealand during the month.

However, isolated areas on both Islands experienced well above average (> +1.20°C) temperatures in October. This was caused by a mix of westerly and easterly wind flows during the month, which caused air to warm as it descended the slopes of the Southern Alps and interior ranges. This effect was most noticeable in a small portion of central Canterbury, where Rangiora's mean monthly temperature was 1.8°C warmer than its October average.

The nationwide average temperature in October 2016 was 12.8°C (0.67°C above the 1981-2010 October average from NIWA's seven station temperature series which begins in 1909). January-October 2016 is the warmest January-October period in the seven station temperature record with departure from average of +0.99°C. The next warmest January-October period was in 1998, which had a departure from average of +0.92°C.

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
High records or near-records				
South West Cape	10.5	0.9	1991	3rd-highest
Whangarei	15.7	1.0	1967	4th-highest
Whatawhata	14.6	1.5	1952	4th-highest
Farewell Spit	14.0	0.9	1971	4th-highest
Puysegur Point	11.1	1.0	1978	4th-highest
Lumsden	10.7	0.9	1982	4th-highest
Low records or near-records				
No records 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
High records or near-records				
Puysegur Point	13.8	1.2	1978	2nd-highest
Kerikeri	20.3	1.3	1981	3rd-highest
Motu	16.1	1.5	1990	3rd-highest

Whatawhata	18.6	1.4	1952	3rd-highest
South West Cape	13.0	0.7	1991	3rd-highest
Auckland (Whangaparaoa)	18.5	0.7	1982	4th-highest
Motueka	19.5	1.7	1956	4th-highest
Low records or near-records				
No records 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
High records or near-records				
South West Cape	7.9	1.0	1991	Highest
Dunedin (Musselburgh)	8.6	1.5	1947	2nd-highest
Alexandra	6.0	1.2	1983	2nd-highest
Masterton	8.1	1.9	1992	3rd-highest
Auckland (North Shore)	12.0	1.2	1994	4th-highest
Waione	9.4	0.8	1991	4th-highest
Ngawi	11.1	0.6	1972	4th-highest
Puysegur Point	8.5	0.9	1978	4th-highest
Low records or near-records				
No records observed				

Sunshine: A sunny month in the west of both islands

Cloudy skies associated with higher than normal rainfall totals meant that October sunshine was below normal (75-89%) or well below normal (< 75%) in parts of the south-western North Island, central Canterbury and central Otago. The low sunshine amounts in the south-western North Island were a consequence of onshore flow producing plenty of cloud cover. In fact, two locations in the Wellington region observed near-record low sunshine amounts in October (refer to the table below). Above normal (110-125%) sunshine was observed in western Northland, western Waikato, and parts of Westland, which resulted from periods of easterly winds that caused sinking motion and increased sunshine on the western coasts of both islands. In addition, well above normal (> 125%) sunshine was experienced in far northern Northland.

Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2016 so far (1 January – 31 October) were Richmond (2318 hours), Blenheim (2107 hours), Takaka (2061 hours) and New Plymouth (2020 hours).

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

Location	Sunshine hours	Percentage of normal	Year records began	Comments
High records or near-records				
Kaitaia	257	134	1985	Highest
New Plymouth	254	134	1972	2nd-highest
Takaka	252	108	1985	4th-highest
Low records or near-records				
Martinborough	145	75	1986	3rd-lowest
Paraparaumu	128	71	1953	4th-lowest

October climate in the six main centres

The South Island and northern North Island main centres recorded above average temperatures in October, while Hamilton and Wellington were near average. Rainfall anomalies in the main centres increased from north to south across the country, with below normal rainfall in Auckland and Tauranga, near normal in Hamilton and Wellington, and above normal rainfall in the South Island main centres. Near normal sunshine was recorded in all main centres in October with the exception of Wellington, which recorded slightly below normal sunshine. Of the six main centres in October 2016, Auckland was the warmest, Tauranga was the sunniest and driest, Wellington was the wettest, Dunedin was the coolest, and Hamilton was the cloudiest.

October 2016 main centre climate statistics:

Temperature			
Location	**Mean temp. (°C)**	**Departure from normal (°C)**	**Comments**
Auckland[a]	15.2	+0.8	Above average
Tauranga[b]	14.8	+0.7	Above average
Hamilton[c]	13.3	+0.3	Near average
Wellington[d]	12.5	+0.5	Near average
Christchurch[e]	12.0	+0.6	Above average
Dunedin[f]	11.8	+0.9	Above average
Rainfall			
Location	**Rainfall (mm)**	**% of normal**	**Comments**
Auckland[a]	69	76%	Below normal
Tauranga[b]	55	62%	Below normal
Hamilton[c]	111	113%	Near normal
Wellington[d]	132	112%	Near normal
Christchurch[e]	67	137%	Above normal
Dunedin[f]	78	127%	Above normal
Sunshine			
Location	**Sunshine (hours)**	**% of normal**	**Comments**
Auckland[a]	189	107%	Near normal
Tauranga[b]	208	98%	Near normal
Hamilton[g]	160	91%	Near normal
Wellington[d]	171	89%	Below normal
Christchurch[e]	193	95%	Near normal
Dunedin[f]	183	109%	Near normal

[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 1 October, a stretch of SH8 near Ettrick in Otago was underwater and motorists were being asked to drive with care due to heavy rainfall.

On 2 October, heavy rain caused flooding and slips in Huntly. Riverview Road, bordering the Waikato River, was reported to be under 'a foot' of water. There were also several small slips along SH25 between Thames and Coromandel.

Rain and thunderstorms caused surface flooding and power outages in the East Coast Bays area of Auckland. Fifteen homes had to be pumped out by fire crews. This was from the remnants of a powerful storm that had battered South Australia earlier in the week.

On 3 October, heavy rain in central Hawke's Bay caused road flooding on SH2 between Waipukurau and Pakipaki, south of Hastings, prompting the NZ Transport Agency to warn drivers to take extra care on the highway.

On 12 October, caution was advised on SH 6 from Hawea to Haast due to flooding.

The highest 1-day rainfall was 160 mm, recorded at Milford Sound on 18 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
No records observed				

Temperatures

Temperatures were quite variable across New Zealand (especially in the South Island) during October as the predominant westerly wind flow was interrupted by several southerly changes which delivered bouts of cool temperatures. The most notable of these southerly changes occurred on 12 October, with unusually cold temperatures producing snow across interior Otago.

On 17 October, Dunedin (Musselburgh) recorded a high temperature of 26.2°C, which was their warmest temperature since 20 March, a span of 211 days. It was also the South Island's warmest temperature that day.

The highest temperature was 27.1 °C, observed at Christchurch (Riccarton) on 19 October and at Wairoa on 20 October. The lowest temperature was -3.8 °C, observed at Mt Cook Airport on 22 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
High records or near-records				
Whangaparaoa	22.6	18th	1982	2nd-highest

Leigh	23.9	11th	1966	4th-highest
Low records or near-records				
No records observed				

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
High records or near-records				
Balclutha	13.1	17th	1972	Highest
Te Puke	15.7	20th	1973	2nd-highest
Masterton	15.6	12th	1992	2nd-highest
Waipara West	16.9	19th	1973	3rd-highest
Port Taharoa	15.4	20th	1974	Equal 4th-highest
Nugget Point	12.8	17th	1972	Equal 4th-highest
Low records or near-records				
Takaka	0.9	30th	1978	Equal 3rd-lowest

Wind

On 2 October, a funnel cloud was seen near Huntly during an intense thunderstorm.

On 3 October, funnel clouds were spotted in Taupo.

On 6 October, strong winds blew down a tree that smashed a dinghy near Taupo.

On 10 October a “freak gust” flipped and destroyed a floatplane in Marlborough Sounds.

On 26 October a small tornado hit central New Plymouth around 1.30 a.m. which lifted roofs, ripped off garage doors, and threw a trampoline about 120 metres.

The highest wind gust was 180 km/hr, observed at Cape Turnagain on 5 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
Kaitaia	109	7th	1985	2nd-highest
Cape Reinga	135	7th	1974	3rd-highest
Puysegur Point	150	10th	1986	4th-highest

Snow and ice

On 12 October, several South Island roads were affected by snow: SH 94 from Te Anau to Milford Sound was closed due to avalanche risk. SH 8 from Omarama to Tarras was closed due to snow. SH 6 from Queenstown to Cromwell and SH 6 from Haast to Wanaka was under caution due to snow.

On 12 October, roads at the top of Lake Wakatipu were blocked by fallen trees. They included the only roads to Paradise, Kinloch and the Routeburn track at the top of the lake.

1800 customers were without power in the Arrowtown, Dalefield, Lower Shotover and Lake Hayes areas due to snow and fallen trees.

An early morning flight from Queenstown to Auckland was delayed due to snow on the runway.

Lightning and hail

On 6 October, thunderstorms in the Auckland region caused a number of power outages. Vector confirmed about 140 customers were without power in Clevedon, as well as about 30 in Point Chevalier, 26 in Silverdale and 18 in Albany. 182 households in Kaukapakapa and Kumeu had no power at 9.10pm but it was back on again by midnight.

On 7 October, a hailstorm in Nelson damaged some orchards.

On 9 October, a storm moving through Whanganui activated several alarms and caused a small electrical fire in the garage of a house on Heads Rd. The violent weather also took out Whanganui Golf Club's computer systems. Power was cut to a small area of Gonville for two hours after the storm.

On 14 October, a hailstorm hit Motueka at about 3.15 pm and lasted for about 20 minutes. The hailstones completely covered the ground and may have done damage to the area's kiwifruit crop.

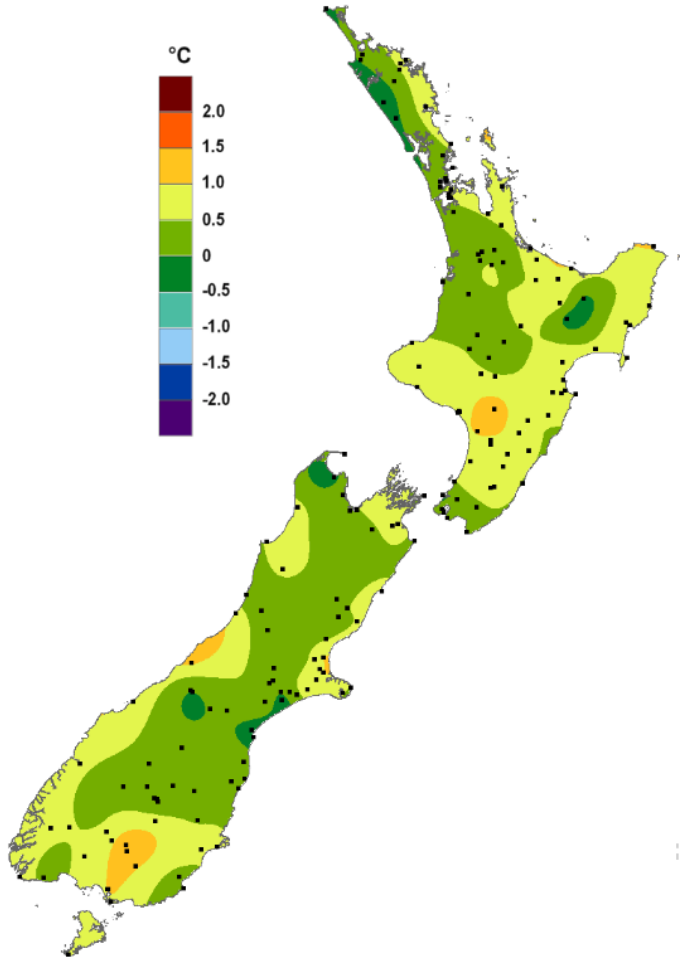
On 19 October, lightning struck a retirement village in Mosgiel, damaging wiring and about 20 circuits.

On 31 October, a thunderstorm produced hail the size of 20c coins over parts of West Auckland, including the Te Atatu Peninsula, Helensville, and the Waitakere Ranges. Hailstones completely covered the ground in places.

For further information, please contact:

Mr Chris Brandolino
Principal Scientist – Forecasting, NIWA National Climate Centre
Tel. 09 375 6335, Mobile 027 886 0014

For climate data enquiries, please contact:
Mr Seth Carrier
Meteorologist/Forecaster, NIWA Auckland
Tel. 09 375 4508



October 2016 mean temperature anomalies, compared to the 1981-2010 average.

It was a near average to slightly above average month in terms of temperatures for much of New Zealand. Isolated areas of Waikato, Hawke's Bay, Tasman, coastal central Canterbury and Southland recorded well above average temperatures for the month.

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