

Variable rainfall patterns; cool in the lower South Island

| | |
|----------------------|---|
| Temperature | Temperatures were near average (-0.50 to +0.50°C of average) across nearly the entire North Island, as well as much of the northern South Island and the West Coast. Isolated above average temperatures (0.51°C to 1.2°C above average) were observed in Northland, the Coromandel Peninsula, Taranaki, Hawke's Bay, and northern Tasman. Meanwhile, widespread below average temperatures (0.51°C to 1.2°C below average) and isolated well below average temperatures (<1.2°C below average) were observed from central Canterbury to Otago. |
| Rainfall | Rainfall was above normal (120% to 149% of normal) or well above normal (>149% of normal) for many east-facing coastal areas, including Northland, the Coromandel Peninsula, Gisborne, Hawke's Bay, southern Canterbury, Otago, and Southland. Conversely, below normal rainfall (50% to 79% of normal) was observed in western Northland, parts of Auckland and Waikato, the Central Plateau, and Marlborough. Elsewhere, generally near normal rainfall (80% to 119% of normal) was observed. |
| Soil Moisture | As of 1 November, soil moisture was near normal across most of New Zealand. Soils were wetter than normal in coastal Gisborne, much of Hawke's Bay, as well as coastal Canterbury, Otago, and Southland. Meanwhile, drier than normal soils were observed in western Northland, Wairarapa, Marlborough, and southern Canterbury to interior Otago. |

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Overview

October 2019 was characterised by lower than normal mean sea level pressure to the east of New Zealand. This pressure setup resulted in a southeast airflow anomaly across the country (i.e. more southeasterly winds than normal). This pattern was associated with the most negative monthly value (-0.9) of the Southern Annular Mode (SAM) since January 2017. In its negative phase, the SAM is associated with unsettled conditions and increased windiness in the New Zealand region.

Weather varied considerably depending on geographic location, with eastern areas generally experiencing wetter and cooler conditions due to the onshore wind flow. Conversely, western areas tended to be a bit drier and more settled. October was also a windy month, with several southerly changes moving up the country. Thirteen locations observed record or near-record extreme wind gusts during the month. High winds were at least partly responsible for a capsized vessel off Cape Brett, where one person died, and exacerbating a large fire in Auckland's CBD (see [Highlights and extreme events](#) section for further details).

The nationwide average temperature in October 2019 was 11.8°C (0.3°C below the 1981-2010 October average from NIWA's seven station temperature series which begins in 1909). The October 2019 temperature anomaly of -0.3°C (i.e. on the cold side of average and officially classed as near average) is the greatest negative deviation from the 1981-2010 average of any month in the last two and a half years, since May 2017 which also had a -0.3°C temperature anomaly. This is also the coldest October compared to average since October 2012, which also had a -0.3°C temperature anomaly. In addition, September and October 2019 mark the first consecutive months to have temperature anomalies on the cold side of average since January and February 2017. It has now been 33 consecutive months since New Zealand experienced a nationwide average temperature that was officially below average (i.e. at least 0.51°C below the 1981-2010 average).

October temperatures were near average (-0.50 to +0.50°C of average) across nearly the entire North Island, as well as much of the northern South Island and the West Coast. Isolated above average temperatures (0.51°C to 1.2°C above average) were observed in Northland, the Coromandel Peninsula, Taranaki, Hawke's Bay, and northern Tasman. Meanwhile, widespread below average temperatures (0.51°C to 1.2°C below average) and isolated well below average temperatures (<1.2°C below average) were observed from central Canterbury to Otago.

October rainfall was above normal (120% to 149% of normal) or well above normal (>149% of normal) for many east-facing coastal areas, including Northland, the Coromandel Peninsula, Gisborne, Hawke's Bay, southern Canterbury, Otago, and Southland. Conversely, below normal rainfall (50% to 79% of normal) was observed in western Northland, parts of Auckland and Waikato, the Central Plateau, and Marlborough. Elsewhere, generally near normal rainfall (80% to 119% of normal) was observed.

Further Highlights:

- The highest temperature was 29.0°C, observed at Methven on 26 October.
- The lowest temperature was -5.9°C, observed at Lake Tekapo on 23 October.
- The highest 1-day rainfall was 148 mm, recorded at Paeroa on 14 October.
- The highest wind gust was 182 km/h, observed at South West Cape on 4 October.
- Of the six main centres in October 2019, Auckland was the warmest, Dunedin was the coldest, Wellington was the wettest, Hamilton was the driest and least sunny, and Christchurch was the sunniest.
- Of the available, regularly reporting sunshine observation sites, the sunniest four regions in 2019 so far are Wider Nelson (2308 hours), Marlborough (2254 hours), Hawke's Bay (2171 hours), and Bay of Plenty (2141 hours).

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Temperature: Near average in the North Island; cool in the lower South Island

The nationwide average temperature in October 2019 was 11.8°C (0.3°C below the 1981-2010 October average from NIWA's seven station temperature series which begins in 1909). The October 2019 temperature anomaly of -0.3°C (i.e. on the cold side of average) is the greatest negative deviation from

the 1981-2010 average of any month in the last two and a half years, since May 2017 which also had a -0.3°C temperature anomaly. In addition, September and October 2019 mark the first consecutive months to have temperature anomalies on the cold side of average since January and February 2017.

A handful of locations observed record or near-record mean maximum or mean minimum temperatures (see following three tables), but it was an unremarkable month overall in terms of mean temperature records.

Record¹ 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 | | | | |
| None recorded | | | | |
| Low records or near-records | | | | |
| Akaroa | 10.7 | -1.6 | 1978 | 2nd-lowest |
| Alexandra | 9.8 | -2.1 | 1929 | 2nd-lowest |
| Clyde | 9.9 | -1.4 | 1978 | 2nd-lowest |
| Timaru | 8.6 | -2.5 | 1885 | 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 |
|-------------------------------------|-----------------------------|----------------------------|--------------------|-------------|
| High records or near-records | | | | |
| Farewell Spit | 18.3 | 1.6 | 1971 | Highest |
| Leigh | 20.2 | 2.6 | 1966 | 4th-highest |
| Low records or near-records | | | | |
| Timaru | 13.5 | -2.2 | 1885 | 2nd-lowest |
| Te Anau | 12.6 | -2.3 | 1963 | 2nd-lowest |
| Akaroa | 15.6 | -2.0 | 1978 | 3rd-lowest |
| Nugget Point | 12.0 | -1.4 | 1970 | 3rd-lowest |
| Five Rivers | 13.5 | -1.7 | 1982 | 4th-lowest |
| Roxburgh | 15.1 | -2.1 | 1950 | 4th-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 |
|-------------------------------------|-----------------------------|----------------------------|--------------------|----------|
| High records or near-records | | | | |
| None recorded | | | | |

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.

| Low records or near-records | | | | |
|-----------------------------|------|------|------|------------|
| Clyde | 3.2 | -1.7 | 1978 | 3rd-lowest |
| Appleby | 5.3 | -2.0 | 1932 | 4th-lowest |
| Brothers Island | 10.1 | -0.3 | 1997 | 4th-lowest |

Rainfall: Generally wet in the east, drier in the west

Rainfall patterns varied considerably depending on geographic location, with eastern areas generally experiencing wetter conditions due to an onshore wind flow. Conversely, western areas tended to be a bit drier and more settled. Hawke's Bay, southern Canterbury, and Otago were generally the wettest areas during October, while western Northland, parts of Auckland and Waikato, the Central Plateau, and Marlborough observed below normal rainfall.

Despite several regions experiencing a very wet month, Balclutha was the only location to receive near-record October rainfall. The monthly total there was 124 mm (204% of normal), which is the 2nd-highest October rainfall total since records began there in 1964. Despite several locations receiving below normal rainfall for the month, no low records or near-records were set.

Record 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 | | | | |
| Balclutha | 124 | 204 | 1964 | 2nd-highest |
| Low records or near-records | | | | |
| None recorded | | | | |

October climate in the six main centres

October temperatures were below average in Christchurch and Dunedin, and near average for all other main centres. Rainfall was below normal in Hamilton, near normal in Auckland, Tauranga and Wellington, above normal in Christchurch, and well above normal in Dunedin. Of the six main centres in October 2019, Auckland was the warmest, Dunedin was the coldest, Wellington was the wettest (beating Dunedin by only 1 mm of rain), Hamilton was the driest and least sunny, and Christchurch was the sunniest.

October 2019 main centre climate statistics:

| Temperature | | | |
|---------------------------|------------------|----------------------------|-------------------|
| Location | Mean temp. (°C) | Departure from normal (°C) | Comments |
| Auckland ^a | 14.7 | +0.3 | Near average |
| Tauranga ^b | 14.3 | +0.2 | Near average |
| Hamilton ^c | 13.3 | +0.3 | Near average |
| Wellington ^d | 11.8 | -0.2 | Near average |
| Christchurch ^e | 10.7 | -0.7 | Below average |
| Dunedin ^f | 10.3 | -0.6 | Below average |
| Rainfall | | | |
| Location | Rainfall (mm) | % of normal | Comments |
| Auckland ^a | 75 | 82 | Near normal |
| Tauranga ^b | 91 | 102 | Near normal |
| Hamilton ^c | 56 | 57 | Below normal |
| Wellington ^d | 122 | 104 | Near normal |
| Christchurch ^e | 61 | 124 | Above normal |
| Dunedin ^f | 121 | 196 | Well above normal |
| Sunshine | | | |
| Location | Sunshine (hours) | | |
| Auckland ^a | 188 | | |
| Tauranga ^b | 197 | | |
| Hamilton ^g | 154 | | |
| Wellington ^d | 191 | | |
| Christchurch ^e | 201 | | |
| Dunedin ^f | 171 | | |

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

Highlights and extreme events

Rain and slips

The highest 1-day rainfall was 148 mm, recorded at Paeroa on 14 October.

On 2 October, a detour was in place at Omoto as heavy rain caused a slip between Greymouth and Stillwater.

On 9 October, West Coast Civil Defence opened an emergency operations centre in Greymouth due to expected heavy rainfall in the ensuing days.

On 14 October, slips caused by heavy rain closed SH 5 between Napier and Taupo, SH 7 between Greymouth and Reefton, SH 25 near Thames, and SH 25A between Kopu and Hikuai, as up to 130 mm of rain fell in the Coromandel.

On 14 October in Coromandel, rising waters in the Kauaeranga River forced 40 freedom campers to move from their camping spot.

On 15 October, NZTA asked motorists to avoid SH 2 near Tangoio due to slips.

On 16 October, the Napier Council requested that residents minimise water usage to prevent an emergency discharge from the wastewater network into the Ahuriri estuary due to heavy rainfall in the preceding days.

On 18 October, the threat of rain caused Nelson's Mask Parade to be delayed until 20 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 |
|--------------|-----------------------------|--------------------------|--------------------|-------------|
| Paeroa | 148 | 14th | 1914 | Highest |
| Mahia | 53 | 15th | 1990 | 2nd-highest |
| Nugget Point | 28 | 9th | 1930 | 4th-highest |

Temperatures

The highest temperature was 29.0°C, observed at Methven on 26 October.

The lowest temperature was -5.9°C, observed at Lake Tekapo on 23 October.

On 26-27 October, several locations around New Zealand experienced record or near-record high maximum temperatures for October. This was caused by an unusually warm air mass crossing the Tasman Sea from Australia.

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 | | | | |
| Whangarei | 25.6 | 27th | 1967 | Highest |

| | | | | |
|------------------------------------|------|------|------|-------------------|
| Whangaparaoa | 23.1 | 27th | 1982 | Highest |
| Whitianga | 25.2 | 27th | 1962 | Highest |
| Te Puke | 25.3 | 27th | 1973 | Highest |
| Whakatane | 28.2 | 27th | 1975 | Highest |
| Motu | 26.3 | 27th | 1990 | Highest |
| Farewell Spit | 24.0 | 26th | 1971 | Highest |
| Ranfurly | 26.8 | 26th | 1897 | Highest |
| Kerikeri | 26.2 | 27th | 1945 | 2nd-highest |
| Stratford | 21.9 | 26th | 1960 | 2nd-highest |
| Richmond | 25.3 | 26th | 1862 | 2nd-highest |
| Lake Tekapo | 25.9 | 26th | 1925 | 2nd-highest |
| Tauranga | 24.6 | 27th | 1913 | 3rd-highest |
| Waipawa | 26.9 | 27th | 1945 | 3rd-highest |
| Ohakune | 22.2 | 27th | 1962 | 3rd-highest |
| Cheviot | 26.8 | 26th | 1982 | 3rd-highest |
| Roxburgh | 27.6 | 26th | 1950 | 3rd-highest |
| Rotorua | 22.8 | 27th | 1964 | 4th-highest |
| Kaikohe | 22.4 | 27th | 1973 | Equal 4th-highest |
| Hawera | 21.1 | 27th | 1977 | Equal 4th-highest |
| Low records or near-records | | | | |
| Balclutha | 7.2 | 11th | 1972 | 2nd-lowest |
| Nugget Point | 6.0 | 11th | 1972 | Equal 2nd-lowest |
| South West Cape | 6.8 | 11th | 1991 | Equal 3rd-lowest |
| Te Puke | 12.4 | 6th | 1973 | 4th-lowest |
| Tiwai Point | 7.9 | 11th | 1972 | 4th-lowest |
| Akaroa | 7.7 | 5th | 1978 | 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 |
|-------------------------------------|----------------------|-----------------------------|--------------------|------------|
| High records or near-records | | | | |
| None recorded | | | | |
| Low records or near-records | | | | |
| Mahia | 4.4 | 24th | 1990 | 3rd-lowest |
| Porirua | 0.1 | 4th | 1968 | 3rd-lowest |
| Upper Hutt | -2.8 | 4th | 1939 | 3rd-lowest |
| Clyde | -2.9 | 6th | 1978 | 3rd-lowest |
| Paraparaumu | -0.6 | 4th | 1953 | 4th-lowest |
| Lake Tekapo | -5.9 | 23rd | 1925 | 4th-lowest |

Wind

The highest wind gust was 182 km/h, observed at South West Cape on 4 October.

On 14 October a 47-foot sloop sank about 37 km off Cape Brett as winds gusted to 40-50 knots and swells reached 6 metres. Two rescue helicopters winched four people out of the water, but one of the people later died.

On 14 October, almost 2000 homes and businesses were without power in the Coromandel and Bay of Plenty where strong winds brought down trees and power lines. Additional downed trees and scattered power outages were reported in Northland and Auckland.

On 14 October, SH 1 between Taupo and Turangi was closed after high winds blew down trees onto the road.

On 22 October, a large fire began in the roof of the under-construction New Zealand International Convention Centre in Auckland's CBD. Gusty winds continuing into the morning of the 23rd aided the spread of the fire and the loss of the Convention Centre's entire roof.

On 23 October, strong winds resulted in several reports of power outages and downed trees in South Auckland. There were also a few power outages reported in Kaipara Flats and Kaukapakapa.

On 30 October, a southerly change moving up the South Island dislodged roofing tiles and solar panels and blew over a fence in Christchurch, as wind gusts approached 100 km/h. Fire and Emergency NZ also needed to clear multiple roads and remove trees that had fallen on houses. One person was injured when a tree fell onto their vehicle in an Ilam carpark. Orion reported about 1,300 customers without power in the Christchurch area.

Some flights arriving at Christchurch Airport after 6 pm on 30 October were unable to disembark until the winds decreased. Around 10 pm, high winds caused an aborted landing and strong turbulence at Wellington Airport.

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 | 115 | 19th | 1970 | Highest |
| South West Cape | 182 | 4th | 1991 | Highest |
| Te Puke | 61 | 24th | 1987 | Equal highest |
| Pukekohe | 82 | 23rd | 1986 | 2nd-highest |
| Mahia | 104 | 2nd | 1991 | 2nd-highest |
| Secretary Island | 133 | 4th | 1994 | 2nd-highest |
| Cape Campbell | 124 | 30th | 1963 | Equal 2nd-highest |
| Paeroa | 95 | 15th | 1991 | 3rd-highest |
| Oamaru | 87 | 30th | 1984 | 3rd-highest |
| Farewell Spit | 98 | 24th | 1973 | Equal 3rd-highest |
| Wanaka | 82 | 27th | 1992 | 4th-highest |
| Mokohinau | 109 | 14th | 1994 | Equal 4th-highest |
| Rotorua | 85 | 24th | 1972 | Equal 4th-highest |

Lightning and hail

On 1 October a severe thunderstorm brought significant hail (up to 3 centimetres deep) to the Napier-Hastings portion of Hawke's Bay, where there was concern that some of the early grape crops may have sustained damage. One orchard owner described the hailstorm as "the heaviest in 20 years". The thunderstorm produced over 350 lightning strikes around Hawke's Bay.

On 23 October, convective showers produced small hail in several locations around Auckland. Hail was also reported in Wellington and Christchurch.

On 30 October, Fire and Emergency NZ announced that lightning may have been the cause of two scrub fires in Ohoka and Hororata in Canterbury.

Also on 30 October, a southerly change moving up the South Island brought heavy hail to Dunedin and Oamaru.

Snow and ice

On 2 October, SH 7 was closed for several hours between the Hanmer Turnoff and Springs Junction due to high elevation snow, while chains were essential for all vehicles using SH 73 between Springfield and Arthur's Pass.

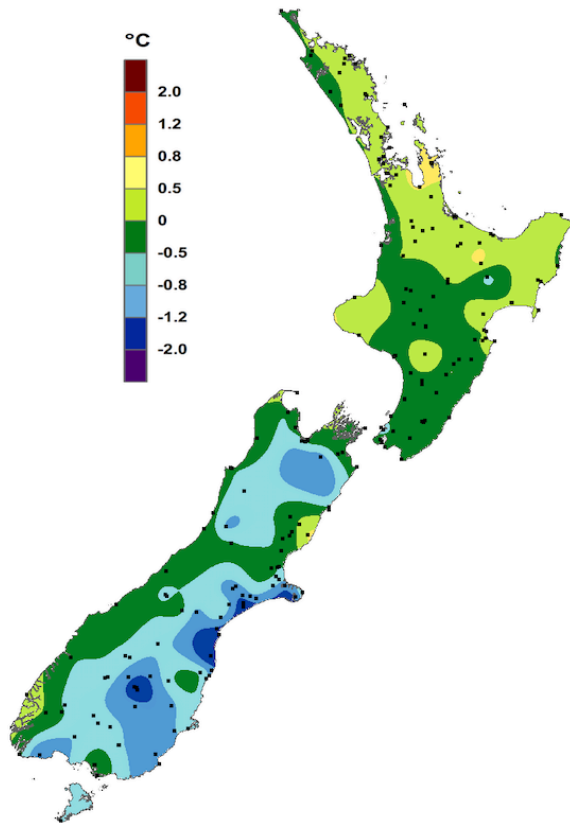
On 22 October, snowfall forced the closure of Milford Road and Haast Pass. SH 73 between Arthurs Pass and Otira and SH 6 between Haast and Makarora were also closed. Snow accumulations of about 4 cm were reported at Arthurs Pass with about 15 cm at Porters Pass. Accumulating snow was expected for locations above 500 metres from northern Otago to the Kaikoura Ranges.

Cloud and fog

On 16 October a number of flights in and out of Napier were delayed due to low cloud, while a flight arriving from Auckland was diverted to Palmerston North.

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October mean temperatures, compared to the 1981-2010 average.

Temperatures were below to well below average from central Canterbury to Otago due to a southeasterly wind flow anomaly.

Elsewhere, temperatures were generally near average across the North Island and the north and west of the South Island (green colours).

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