

A dry start to winter for much of the South Island

Rainfall	Rainfall was well below normal (< 50%) for Taranaki, Tasman, Nelson, parts of West Coast, inland south Canterbury, inland Otago, Fiordland, northern Southland, and Stewart Island. Below normal rainfall (50-79%) was recorded in the rest of the South Island aside from northern Canterbury. Rainfall was well above normal (>149%) for eastern Northland, Auckland, Coromandel, Hawke's Bay, Gisborne, and northern Canterbury.
Temperature	Temperatures were above average (+0.51°C to +1.20°C of the June average) for the Far North, eastern Waikato, Bay of Plenty, East Cape, and parts of Canterbury and the West Coast. Below average temperatures (-0.51°C to -1.20°C of the June average) were recorded in Taranaki, Tararua District, Marlborough, inland Canterbury, Otago and Southland. Temperatures were near average (-0.50°C to +0.50°C of the June average) for remaining parts of New Zealand.
Soil Moisture	As of 1 July 2018, soil moisture levels were above normal for the time of year for eastern and central parts of the South Island north of Southland, and the Hawke's Bay. Soil moisture levels were generally near or slightly above normal for the time of year across the remainder of the country.

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Overview

Mean sea level pressures were higher than normal over the southern South Island and to the south, east and west of the South Island in June 2018. In contrast, near normal mean sea level pressure was observed over and to the north of the North Island. This pressure setup resulted in anomalous easterly and south-easterly winds over New Zealand during June, a pattern that was generally reflected in the rainfall anomalies: dry in the west and wet in the east.

There was a striking difference between western and eastern areas in terms of rainfall for June. The northern and eastern North Island and northeastern South Island bore the brunt of numerous heavy rainfall events from the east. Much of this area received over one-and-a-half times their usual June rainfall, with over 200% of normal June rainfall recorded in some locations. In stark contrast, most of the remainder of the South Island, as well as Taranaki, experienced well below normal rainfall, with less than half of the usual June rainfall falling for much of the South Island.

Temperatures varied during June across the country. It was warmer than usual June for the north and east of the North Island, but much of the South Island and the southern North Island recorded below normal temperatures for the month. Mean temperatures for the eastern South Island were warmer than usual, a consequence of persistent cloud and resulting in well above average nocturnal (minimum) temperatures. However, the stubborn cloud also resulted in below average daytime (maximum) temperatures. Overall, minimum temperatures were most unusual, resulting in above average mean temperatures. Towards the end of June, several snowfall events and southerly airflows sent temperatures tumbling downwards for much of the country.

The nationwide average temperature in June 2018 was 8.6°C (the same as the 1981-2010 June average from NIWA's seven station temperature series which begins in 1909). Based on the seven station series, the first half of 2018 was the fifth-warmest start to any calendar year on record. 2018 sits behind 1998, 1937, 1999 and 2016.

Further Highlights:

- The highest temperature was 21.0°C, observed at Whangarei on 3 June.
- The lowest temperature was -10.4°C, observed at Mt Cook Airport on 3 June.
- The highest 1-day rainfall was 169.2 mm, recorded at Ngawi on 12 June.
- The highest wind gust was 169 km/h, observed at White Island on 12 June.
- Of the six main centres in June 2018, Tauranga was the warmest and sunniest, but also the wettest, Dunedin was the coolest and driest, and Christchurch was the least sunny.
- Of the available, regularly reporting sunshine observation sites, the sunniest four regions in 2018 so far (1 January – 30 June) were Wider Nelson (1242 hours), Marlborough (1218 hours), Bay of Plenty (1175 hours) and Hawke's Bay (1170 hours).

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Rainfall: Wet in the north and east, dry in the west and south

June 2018 was a contrasting month for rainfall across New Zealand. Subtropical airmasses, unusual for the time of year, brought very heavy rainfall to northern and eastern parts of the North Island early in June (more than double the June normal rainfall in some areas). Anomalous easterly winds meant that the eastern South Island north of Christchurch also experienced significant rainfall during June. However, no high rainfall records were experienced for the month. In stark contrast, due to sheltering from the east, much of the South Island and Taranaki experienced very little rainfall during June, resulting in well below normal rainfall totals (<50% of the June normal) for those areas. Stewart Island in particular had a very dry June, with only 10% of normal June rainfall recorded there (12 mm, its driest June on record). Reefton and Takaka also recorded their lowest June rainfall totals.

By the end of June, soil moisture levels were above normal for the time of year for eastern and central parts of the South Island north of Southland, and Hawke’s Bay. Soil moisture levels were generally near or slightly above normal for the time of year across the remainder of the country.

Record¹ or near-record June 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				
Takaka	60	29	1976	Lowest
Reefton	58	29	1960	Lowest
South West Cape	12	10	1991	Lowest
Westport	83	36	1944	3rd-lowest

Temperature: Mild for most of the North Island, cool in the South Island

The nationwide average temperature in June 2018 was 8.6°C (the same as the 1981-2010 June average from NIWA’s seven station temperature series which begins in 1909). This marks the third consecutive month where nationwide temperatures were near average, following a run of months from late 2017 through early 2018 where nationwide temperatures were well above average.

For the Far North and eastern parts of the North Island, June was warmer than usual with above average temperatures (+0.51°C to +1.20°C of the June average). This was partly due to subtropical airflows (which also brought heavy rain) early in June. In addition, numerous locations in northern Canterbury experienced record or near-record-high mean minimum temperatures for June, associated with high amounts of cloud cover which helped to keep night time temperatures elevated.

The high pressure sitting over much of the South Island during the month, and occasional southerly outbreaks, influenced temperatures there, with below average temperatures (-0.51°C to -1.20°C of the June average) being recorded in much of the South Island, particularly in the south and inland. Stratford was particularly colder than usual, recording its lowest June mean, mean minimum and mean maximum temperatures on record.

Overall, temperatures were near average (-0.50°C to +0.50°C of the June average) for most parts of New Zealand during June 2018.

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.

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

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Cheviot	7.8	1.1	1982	4th-highest
Low records or near-records				
Stratford	6.0	-2.4	1960	Lowest

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Secretary Island	13.0	1.0	1985	3rd-highest
Kerikeri	17.6	1.0	1945	4th-highest
Low records or near-records				
Stratford	9.9	-2.2	1960	Lowest

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

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Cheviot	3.7	2.8	1982	Highest
Rangiora	3.7	2.6	1965	Highest
Orari Estate	2.3	2.1	1972	Highest
Medbury	2.0	1.9	1927	2nd-highest
Waiau	2.5	2.6	1974	2nd-highest
Culverden	2.0	2.2	1928	4th-highest
Low records or near-records				
Stratford	2.2	-2.6	1960	Lowest
Tiwai Point	2.4	-1.4	1970	4th-lowest

June climate in the six main centres

Of the six main centres in June 2018, Tauranga was the warmest and sunniest, but also the wettest, Dunedin was the coolest and driest, and Christchurch was the least sunny (although that station was missing two days of sunshine data). Tauranga was the wettest and sunniest location because half of the rain for June fell on one day (94 mm on June 3rd), and the rest of the month had mostly dry days. It was a particularly dry month for Dunedin, where total rainfall was just 43% of the June average.

June 2018 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland ^a	11.0	-0.8	Below average
Tauranga ^b	11.5	+0.5	Above average
Hamilton ^c	9.4	+0.0	Near average
Wellington ^d	9.5	-0.2	Near average
Christchurch ^e	7.3	+0.9	Above average
Dunedin ^f	7.2	-0.1	Near average

Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland ^a	192	162	Well above normal
Tauranga ^b	195	170	Well above normal
Hamilton ^c	141	112	Near normal
Wellington ^d	128	93	Near normal
Christchurch ^e	92	160	Well above normal
Dunedin ^f	25	43	Well below normal

Sunshine	
Location	Sunshine (hours)
Auckland ^a	124
Tauranga ^b	142
Hamilton ^g	115 ²
Wellington ^d	80
Christchurch ^e	73 ³
Dunedin ^f	87

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

² Missing 1 day

³ Missing 2 days

Highlights and extreme events

Temperatures

The highest temperature for the month was 21.0°C, observed at Whangarei on 3 June. The lowest temperature was -10.4°C, observed at Mt Cook Airport, also on 3 June.

A cold snap hit the South Island during the first few days of winter 2018. A low temperature of -10.4°C was recorded at Mt Cook Airport on June 3rd (the lowest temperature recorded (excluding high altitude stations) in New Zealand for the month), -9.2°C was recorded at Ranfurly on the 1st, and -8.5°C was observed at Middlemarch on the 2nd.

On 11-13 June, a subtropical low pressure system which brought heavy rain to parts of the North Island also brought with it warm air, leading to near-record-high maximum temperatures for some locations (see table below).

On the mornings of 22 and 23 June, central areas of both North and South Islands recorded sub-zero temperatures. Tara Hills near Omarama recorded -7.8°C on the 23rd.

The last few days of June were cold and frosty for many parts of the country, with sub-zero overnight temperatures for many. On the 27th, it was the coldest morning in Auckland since July 2015, with 0.2°C recorded at Mangere. Interestingly, it was much warmer in the southern South Island due to a blanket of cloud – for example, Dunedin’s overnight temperature only fell to 7.8°C.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Taupo	18.6	12th	1949	2nd-highest
Reefton	17.9	13th	1960	2nd-highest
Five Rivers	17.1	9th	1982	3rd-highest
Whangaparaoa	19.3	16th	1982	4th-highest
Turangi	17.6	12th	1968	4th-highest
Secretary Island	16.4	11th	1985	4th-highest
Low records or near-records				
Stratford	5.5	26th	1972	3rd-lowest
Westport	7.9	25th	1966	3rd-lowest
Arapito	7.9	25th	1978	Equal 4th-lowest

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Cheviot	10.2	10th	1982	3rd-highest
Low records or near-records				
Stratford	-4.5	27th	1960	2nd-lowest
Kaikoura	-2.1	23rd	1963	2nd-lowest
Five Rivers	-7.0	4th	1982	Equal 3rd-lowest

Rain and slips

The highest 1-day rainfall for the month was 169.2 mm, recorded at Ngawi on 12 June.

Heavy rain fell in the northern and eastern North Island during Queen's Birthday Weekend (1-3 June). The rain caused flooding and slips in the Bay of Plenty, Auckland and Coromandel. Numerous roads were closed due to flooding and slips, including SH 2 at Katikati and SH 25 in Coromandel.

On 4-5 June, torrential rain fell in the East Cape area, causing significant flooding and slips. Many roads were closed and some properties lost power. Tolaga Bay was particularly affected by debris flows caused by forestry slash (logs) that had been left on hillsides. The debris flowed onto paddocks and over roads, and even moved a house off its foundations. Sixty-one bridges in the Tolaga Bay catchment were closed due to flooding, and one bridge had twisted and moved at least 30 cm after the flash floods. A Tolaga Bay family was trapped on their roof and eventually airlifted to safety after their home became surrounded by floodwaters. Their woolshed, cars, and farm equipment had been swept away by the flood.

On 11-12 June, a subtropical low pressure system brought heavy rain to the North Island that caused slips on many roads around the island. The worst-affected areas were Gisborne and Hawke's Bay. SH 2 between Gisborne and Opotiki was closed due to slips, and the township of Te Karaka was cut off. SH 5 between Napier and Taupo was also closed, due to multiple slips and surface flooding. Many roads were down to one lane.

On 12-13 June, Kaikoura and the surrounding area was affected by heavy rain, causing small slips on SH 1 near the town. The road was closed to traffic as the slips were cleared.

On 20-21 June, heavy rain caused flooding, slips and trees to come down across Whangarei. In addition, two early learning services and five schools across Northland were closed due to flooding and road closures (Kaeo Creative Minds ECE, Hukerenui Playcentre, Kokopu School, Otaika Valley School, Whananaki School, Hukerenui School and Whangaruru School). A small number of customers near Te Ngaere Bay were without power after a tree brought down power lines. SH 1 at Puhipuhi Road was closed due to flooding, and other roads were also closed due to flooding and slips.

On 24 June, a large slip closed SH 2 in the Waioeka Gorge between Opotiki and Gisborne.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Whangarei	132	20th	1943	2nd-highest
Te Puke	92	3rd	1973	3rd-highest
Mahia	82	3rd	1990	3rd-highest
Motu	139	11th	1920	4th-highest
Cape Campbell	69	12th	1890	4th-highest

Wind

The highest wind gust for the month was 169 km/h, observed at White Island on 12 June.

On 11-12 June, the subtropical low that brought heavy rain to Hawke's Bay and Gisborne also brought strong winds. Thousands of homes were without power in the Gisborne-Hawke's Bay areas after a night of heavy rain. In particular, 1570 Eastland Network customers had no power after a trampoline blew into lines in the Te Araroa township. A 3.8 tonne shipping container and a navigation buoy washed up on the beach in Napier. Trains between Upper Hutt and Masterton were delayed for a time due to a fallen tree on the tracks near Maymorn. Eleven flights into Auckland Airport were cancelled or delayed, and four flights from New Plymouth were cancelled.

On 18 June, a suspected tornado ripped through Matamata, lifting a schoolboy two metres into the air. The wind also damaged fences and sheds, and lifted roofs and a trampoline.

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

Location	Extreme wind gust (km/hr)	Date of extreme gust	Year records began	Comments
Whangarei	93	21st	1973	Equal highest
Whakatane	106	12th	1974	Equal highest
Secretary Island	128	25th	1994	Equal 2nd-highest
Mokohinau	119	21st	1994	4th-highest
Motu	95	11th	1991	Equal 4th-highest

Cloud and fog

On 13 and 14 June, heavy fog affected flights at Dunedin Airport. Also on 14 June, fog at Queenstown Airport caused some minor delays.

On 16 June, fog caused the delay of 28 domestic flights and cancellation of nine flights in and out of Auckland Airport. Fog restrictions were lifted at 9 a.m.

On 20 June, fog again caused some delays for travellers flying in and out of Dunedin Airport.

On 21 June, fog affected flights in and out of Christchurch Airport.

On 29 June, dense fog shrouded Auckland Airport and caused the cancellation of 35 regional flights and the delay of another 30 regional flights. The fog finally lifted around 11.20 a.m.

Snow and Ice

On 1 June, a spectacular hoar frost occurred in parts of Central Otago, including Middlemarch and Lauder. Hoar frosts occur when dew forms on surfaces and then freezes.

On 6 June, snow fell to low levels in the South Island. Dunedin streets were covered in a thin dusting of snow, and more snow fell further inland. Police were called to a few minor accidents and cars getting stuck in snow. SH 85 from Ranfurly to Omakau, SH 93 from Mataura to Clinton, SH 8 from Cromwell to Omarama (Lindis Pass), SH 8 between Alexandra and Roxburgh, SH 94 (Milford Road), the Crown Range Road and Danseys Pass Road were closed, and snowfall warnings were issued for South Island passes as well as the Desert Road and the Napier-Taupo Road. Local roads around Dunedin and Queenstown were closed or required motorists to use chains. Schools in Queenstown and Arrowtown were closed for the day and five primary schools on Dunedin's hills were also shut. Several bus services in Dunedin were only running on the flat and terminating at the Octagon because of snow on the hills. Queenstown airport delayed or cancelled many flights. There was also snow on Christchurch's Summit Road on the Port Hills.

On 7 June, snow was still lying in many areas, and the Desert Road opened at 11 a.m. after being closed due to snow.

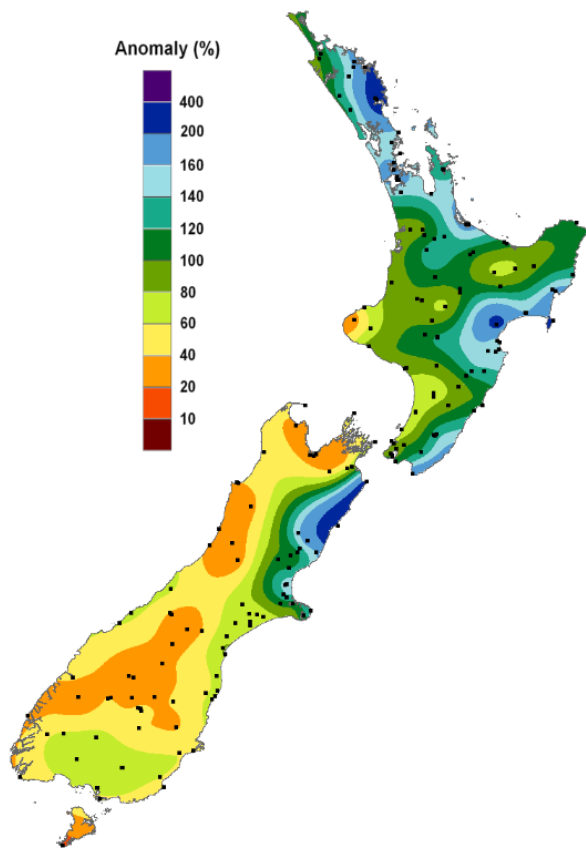
On 25 June, SH 7 between the Hanmer turnoff and Springs Junction (Lewis Pass) and SH 94 between Hollyford and Milford Sound was closed for a time due to snow, and SH 73 at Arthurs Pass and SH 8 at Lindis Pass was closed to towing vehicles and chains were essential. Caution was advised due to ice on numerous State Highways in Canterbury and Otago.

On 26 June, a southerly blast caused numerous state highways to be closed due to snow and ice. The Desert Road (SH 1), SH 8 from Cromwell to Omarama (Lindis Pass), SH 94 from Hollyford to Milford Sound, SH 93 from Clinton to Mataura, SH 87 from Outram to Middlemarch, SH 7 from Hanmer turnoff to Springs Junction (Lewis Pass) were closed. Snow and ice warnings were in place for many other South Island roads, as well as the Rimutaka Hill Road (SH 2) in Wellington.

On 27 June, an iced-over plane at Palmerston North airport caused a flight to be delayed. Ice on roads caused car crashes early in the morning in Taranaki.

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

June rainfall was above or well above normal for the north and east of the North Island and the northeastern South Island (blue and teal shades). In contrast, rainfall was well below normal for much of the South Island and Taranaki, indicated by the orange shades.

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