

A wet start to spring for some but dry for most

Temperature	Mean temperatures for September were near average (i.e. -0.50 to $+0.50^{\circ}\text{C}$) across most of the country. Below average mean temperatures (i.e. -0.51 to -1.20°C) were restricted to eastern locations in Canterbury and Marlborough, as well as part of Northland, and other isolated patches in the North Island.
Rainfall	Rainfall was above normal (i.e. 120-149% of normal) to well above normal (i.e. $>149\%$ of normal) for eastern parts of the North Island as well as around Otago and Southland. Northland and Wellington experienced near normal rainfall totals (i.e. 80-119% of normal) while much of the country experienced below normal (50-79% of normal) or well below normal ($<50\%$ of normal) rainfall levels.
Soil Moisture	As of 1 October 2018, soil moisture levels were above normal for the time of year for much of Otago, particularly toward the coast, as well as around coastal Gisborne. Drier than normal soil moistures were present from Nelson through to northern Canterbury and through much of the central and southern North Island. 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, September mean sea level pressure was lower than normal over and to the northeast of the North Island and higher than normal over and to the west of the South Island, resulting in more southeasterly winds than normal over the country.

Rainfall during September was above normal (i.e. 120-149% of normal) to well above normal (i.e. $>149\%$ of normal) for eastern parts of the North Island as well as Otago, Banks Peninsula, and much of Southland. In contrast, most of the remaining locations throughout the country experienced below normal (50-79% of normal) or well below normal ($<50\%$ of normal) rainfall levels except for parts of Northland and Wellington which experienced near normal rainfall totals.

Near average temperatures (i.e. -0.50 to $+0.50^{\circ}\text{C}$ of the September average) were experienced across most of the country while limited areas in the Far North as well as coastal parts of Canterbury and Marlborough observed below average temperatures (i.e. -0.51 to -1.20°C of the September average).

The nationwide average temperature in September 2018 was 10.5°C (the same as the 1981-2010 September average from NIWA's seven station temperature series which begins in 1909).

Further Highlights:

- The highest temperature was 25.8°C, observed at Wairoa on 13 September.
- The lowest temperature was -6.5°C, observed at Mt Cook Airport on 6 September.
- The highest 1-day rainfall was 182 mm, recorded at Milford Sound on 29 September.
- The highest wind gust was 152 km/h, observed at Akitio on 13 September.
- Of the six main centres in September 2018, Christchurch was the coolest, Wellington was the wettest, Tauranga was the warmest, driest and sunniest, and Auckland was the least sunny.
- Of the available, regularly reporting sunshine observation sites, the sunniest four regions in 2018 so far (1 January – 30 September) are Wider Nelson (1828 hours), Marlborough (1804 hours), Bay of Plenty (1761 hours) and Mackenzie Basin (1750 hours).
- Of the available, regularly reporting low elevation rainfall sites, the two wettest locations in 2018 so far (1 January – 30 September) are Milford Sound (5569 mm) and Arthur's Pass (3554 mm). The two driest locations in 2018 so far are Alexandra (328 mm) and Clyde (364 mm).

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Rainfall: Very wet for Otago and the east of the North Island. Dry elsewhere.

In the North Island, eastern locations bore the brunt of wet weather during early September resulting in rainfall totals that were well above normal (i.e. >149% of normal) for Hawke's Bay and coastal Gisborne, and above normal (i.e. 120-149% of normal) in eastern Wairarapa. Notably, Hastings recorded 268% of its normal rainfall total for September, making 2018 its second-wettest September on record. Additionally, Wairoa received 233% of its September normal, the fourth-wettest September on record for this location. Near normal rainfall (i.e. 80-119% of normal) was observed in Wellington and parts of Northland however many remaining North Island locations experienced below normal (i.e. 50-79% of normal) or well below normal (i.e. <50% of normal) rainfall for the time of year. For Whakatane, this was the driest September on record with only 34% of normal September rainfall observed for the month.

In the South Island, much of Otago and inland Southland experienced above or well above normal September rainfall. Above normal levels were also experienced around Banks Peninsula and eastern Marlborough while much of the remaining South Island, including coastal Southland experienced either below or well below normal September rainfall. It was the driest September on record for Arapito (northern West Coast) where only 45% of normal September rainfall was observed.

As of 1 October 2018, soil moisture levels were above normal for the time of year for much of Otago, particularly toward the coast, as well as around coastal Gisborne. Drier than normal soils were present from Nelson through to northern Canterbury and through much of the central and southern North Island. Soil moisture levels were generally near normal for the time of year across the rest of the country.

Record¹ or near-record September rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
High records or near-records				
Hastings	155	268	1965	2nd-highest
Wairoa	206	233	1964	4th-highest
Low records or near-records				
Whakatane	31	34	1952	Lowest
Arapito	99	45	1978	Lowest
Te Puke	51	40	1973	2nd-lowest
Taumarunui	22	15	1913	2nd-lowest
Turangi	40	29	1968	2nd-lowest
Takaka	55	28	1976	2nd-lowest
Auckland (Western Springs)	47	45	1948	3rd-lowest
Pukekohe	41	37	1944	3rd-lowest
Kaitaia	45	48	1948	4th-lowest
Auckland (Mangere)	45	44	1959	4th-lowest
Lower Retaruke	64	42	1966	4th-lowest
Farewell Spit	33	24	1874	4th-lowest
Hokitika	93	39	1866	4th-lowest

Temperature: Near average temperatures for most of New Zealand

The nationwide average temperature in September 2018 was 10.5°C (the same as the 1981-2010 September average from NIWA’s seven station temperature series which begins in 1909).

Mean temperatures for September were near average (i.e. -0.50 to +0.50°C) across most of the country with below average mean temperatures (i.e. -0.51 to -1.20°C) restricted to eastern locations in Canterbury and Marlborough, as well as part of Northland, and other isolated patches in the North Island. Only a few locations observed above average mean temperatures (i.e. +0.51 to + 1.20°C) for September. Of these, South West Cape was the only location to observe near-record warmth in this category, recording a mean temperature of 9.7°C (0.9°C above its September average) making 2018 the fourth-warmest September on record for this location.

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.

A handful of locations experienced near record high mean maximum (daytime) temperatures, most notably Taupo where maximum daytime temperatures were 2.0°C above the September average, the second-highest on record for September.

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

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
South West Cape	9.7	0.9	1991	4th-highest
Low records or near-records				
None recorded				

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Taupo	15.9	2.0	1949	2nd-highest
Hamilton (Ruakura)	18.0	1.6	1906	2nd-highest
Farewell Spit	16.2	0.8	1971	2nd-highest
Motu	14.4	1.5	1990	4th-highest
Low records or near-records				
Brothers Island	13.1	-0.4	1997	4th-lowest

Record or near-record mean minimum air temperatures for September 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	7.3	1.0	1991	3rd-highest
Low records or near-records				
Appleby	3.0	-2.4	1932	3rd-lowest
Whatawhata	5.6	-1.8	1952	3rd-lowest
Takaka	3.6	-1.2	1978	4th-lowest

September climate in the six main centres

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

September 2018 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland ^a	12.4	-0.7	Below average
Tauranga ^b	12.9	+0.5	Near average
Hamilton ^c	11.4	+0.1	Near average
Wellington ^d	10.7	-0.1	Near average
Christchurch ^e	9.2	-0.2	Near average
Dunedin ^f	9.5	0.0	Near average
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland ^a	45	44	Well below normal
Tauranga ^b	33	40	Well below normal
Hamilton ^c	57	57	Below normal
Wellington ^d	106	108	Near normal
Christchurch ^e	37	91	Near normal
Dunedin ^f	50	104	Near normal
Sunshine			
Location	Sunshine (hours)		
Auckland ^a	157		
Tauranga ^b	211		
Hamilton ^g	176		
Wellington ^d	163		
Christchurch ^e	187 ²		
Dunedin ^f	206		

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

² Missing 1 day

Highlights and extreme events

Temperatures

The highest temperature for September was 25.8°C, observed at Wairoa on 13 September, which is also the highest September temperature on record for this location.

The lowest temperature for September 2018 was -6.5°C, observed at Mt Cook Airport on 6 September.

On 19 September, Hanmer Forest in Canterbury recorded both New Zealand's coolest (-3.1°C) and warmest (22.5°C) temperature for the day.

On 20 September, several North Island locations saw their temperature exceed 20°C, making it the warmest day since April or May for Auckland, Te Kuiti, Wellington, Masterton, and Tauranga.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Wairoa	25.8	13th	1964	Highest
Motueka	24.1	14th	1956	Highest
Hamilton (Ruakura)	23.0	20th	1906	Equal highest
Rotorua	21.3	20th	1964	2nd-highest
Taupo	22.5	20th	1949	2nd-highest
Hamilton (Airport)	22.7	20th	1946	2nd-highest
Te Kuiti	23.7	20th	1959	2nd-highest
Gisborne	25.1	13th	1905	2nd-highest
Whangaparaoa	21.2	20th	1982	3rd-highest
Motu	21.5	13th	1990	3rd-highest
Whatawhata	21.9	20th	1952	3rd-highest
Lower Retaruke	22.6	20th	1966	3rd-highest
Richmond	22.8	14th	1862	Equal 3rd-highest
New Plymouth	20.6	19th	1944	4th-highest
Waiau	24.4	15th	1974	Equal 4th-highest
Low records or near-records				
Wanaka (Airport)	3.9	17th	1972	2nd-lowest
Alexandra	5.3	17th	1930	Equal 3rd-lowest

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Hastings	14.8	18th	1972	Equal 3rd-highest
Le Bons Bay	13.2	14th	1984	Equal 3rd-highest
Akaroa	14.2	14th	1978	4th-highest
Te Anau	11.7	16th	1973	4th-highest
South West Cape	11.9	16th	1991	4th-highest
Low records or near-records				
Turangi	-5.4	10th	1968	2nd-lowest
Appleby	-3.0	8th	1932	3rd-lowest
Timaru	-4.3	8th	1885	4th-lowest
Motu	-4.8	10th	1990	Equal 4th-lowest

Rain and slips

The highest 1-day rainfall for the month was 182 mm, recorded at Milford Sound on 29 September.

On 1 September, a large slip blocked both lanes on SH35 near Tirohanga Road, 15 km east of Opotiki, in the Eastern Bay of Plenty.

Beginning 3 September, a low-pressure system lingering to the east of the country delivered heavy rain to eastern and southeastern parts of the North Island for almost a week. Reported impacts of this storm are summarised below:

- On 3 September, several slips occurred in Wellington. One of these fell on the front of a car on Ohiro Rd in Brooklyn while another came down on the westbound lane of SH58. A slip in Khandallah also halted train services between Ngaio and Johnsonville for a few hours in the evening as commuters headed home.
- On 4 September, two large rocks fell on SH2 near Silverstream at about 1.40 a.m. Later, at about 4.30 a.m, a tree fell on Wilton Rd and a slip came down on Churchill Drive in Crofton Downs blocking two lanes.
- On 4 September, a slip at the Waiotahi Bluff covered parts of SH2 near Opotiki. Multiple slips and drop-outs also reduced SH35 to one lane, particularly between Hawaii and Omaio.
- On 5 September, there was surface water on most state highways in the Hawke’s Bay region. Slips were reported on several state highways including SH5 (multiple slips) between Napier and Taupo, SH35 in the Houpoto area, and SH50 near Maraekakaho, most of which reduced these roads to one lane for some time. Ōpiki River bridge on SH56, between Tane Rd and Alve Rd, was closed due to flooding and did not reopen until 7 September. Slips and swollen rivers also caused numerous closures to other roads in Hastings, including Makahu Rd at the Ford, Aropaoanui Rd, Ellis Wallace

Rd, Kereru Rd, Mackenzie Rd and Salisbury Rd. Residents of Ocean Beach were cut off after the road connecting it to Hastings had flooded.

- On 5 September, a group of five young trampers were rescued from a DoC hut in Rimutaka Forest Park. The group had set out on Sunday 2 September, planning to stay only one night but were stranded after heavy rain raised a river to an impassable level, leaving the group stranded. The group had made contact by text message on the afternoon of Monday 3 September and a Search and Rescue team in a four-wheel drive was able to reach them during a lull in the rain on Wednesday 5 September.
- On 5 September, heavy rain forced the closure of several Hawke's Bay schools including Argyll East School, Elsthorpe School, Maraekakaho School, Pukehou School, and Te Aute College. Several schools also remained closed on 6 September.
- On September 5, Napier residents were asked not to take baths or flush toilets for the next 36 hours as the city's wastewater system had been overloaded by 24 hours of torrential rain. Rapid accumulation of rainfall had placed pressure on Napier's stormwater and wastewater systems, resulting in sewage spilling up from manholes. To reduce the public health risk, the council decided to release the pressure by discharging wastewater into the Ahuriri Estuary.
- On 6 September, the Rangitikei District Council advised Hunterville and Mangaweka residents to conserve water until further notice, as heavy rain had overwhelmed water treatment plants.
- On 6 September, a creek in Raukawa, about 15 minutes south of Hastings, had breached its banks, sending waters into the local marae, hall, and other properties. The road through the town had deep flooding, and several cars had been towed after attempting to drive through it.
- On 6 September, a 20m-wide slip slid about 300m on to Te Parae Rd, east of Masterton. There were also reports of multiple slips along the Rimutaka Hill.
- On 7 September, electricity distributor Unison reported that 29 people were without power on Dartmoor Rd, on the outskirts of Napier, caused by a slip which brought down trees and debris. The Unison spokesperson also stated that the largest isolated outage across the region during the storm had occurred in the northern part of Hawke's Bay on 5 September where 370 people had lost power.
- On 7 September, SH2 just north of Te Pohue and SH5 Napier to Wairoa were both closed due to slips. Both roads were reopened later that day however flooding on SH5 forced a second closure which remained in place until 8 September.
- On 8 September, SH5 was again reduced to one lane following a fresh slip. It was also reported that Puketitiri Rd had been severely affected to date with slips in 13 different places, while Maraekakaho was another area quite badly affected, with 13 roads in the area affected by slips, flooding and debris on the roads.

- On 9 September, a slip on SH2 in the Waioeka Gorge, Bay of Plenty, reduced traffic to one lane for several hours.
- On 24 September, it was reported that the early September storm saw the loss of an estimated 100,000 spring lambs.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Waiouru	48	4th	1950	Highest
Wairoa	79	5th	1967	2nd-highest
Hastings	57	5th	1967	3rd-highest
Oamaru	32	24th	1950	3rd-highest
Takapau Plains	57	4th	1962	4th-highest

Wind

The highest wind gust for the month was 152 km/h, observed at Akitio on 13 September.

On 3-4 September, a severe weather forecast for the Cook Strait forced the cancellation of some ferries as well as Wellington harbour ferry sailings.

On 4 September, a wild and windy night in Wellington had caused a yacht to break its mooring in Evans Bay. It was found crashed on the rocks beneath Hataitai.

On 9 September, a gust of wind brought down New Zealand's oldest oak tree (aged 194 years) in a paddock at Waimate North.

On 10 September, a Hawke's Bay surfer was swept about 8 km out to sea by a strong offshore wind and outgoing tide. He was spotted by a helicopter during a search mission which lasted a few hours. Having been in the water for more than 6 hours, he was taken to Hawke's Bay Hospital suffering from hypothermia.

On 16 September, firefighting crews responded to a grass fire in Washdyke, just north of Timaru. The fire was believed to have been started with a wind-induced power-pole explosion.

On 26 September, strong winds caused several flights in and out of the Hawke's Bay Airport to be delayed. One flight from Wellington to Napier circled the airport several times before landing on its first approach.

No record or near record wind gusts were recorded during September 2018.

Snow and Ice

On 2 September, due to snow on SH94 between Knobs Flat Depot to Murrells Creek Bridge, Southland, chains were to be carried during the evening.

On 3 September, an early spring storm blowing through much of the country brought snow to low levels in Canterbury and Marlborough. Mount Hutt, Mount Cheeseman and Porters ski fields were closed as snow reached low levels in the South Island.

On 4 September, SH1 from Rangipo to Waiouru (Desert Road) was closed due to high levels of snow and ice but reopened by 7.05 a.m. The road closed for a second time in the afternoon and reopened at 5.00 a.m. the following morning.

On 17 September, a cold front moved over the South Island bringing heavy rain and snow, particularly to Central Otago and parts of Southland. Up to 45 cm of snow was reported on the ground in some Queenstown suburbs with more than a few centimetres falling all the way down to lake level in both Wanaka and Queenstown.

- All schools in Queenstown and Arrowtown as well as Mararoa School in Te Anau Basin were closed for the day.
- Parts of the Wakatipu basin were without power largely due to snow-laden tree branches coming down on power lines, particularly in the Arrowtown, Frankton and Glenorchy areas. Lines company Aurora Energy managed to restore power to 3000 customers and confirmed that 650 people remained without power the following day, including nearly 400 customers in Glenorchy, due to difficulty getting through on the snowy road. Parts of Queenstown's CBD as well as Lake Hayes Estate and other suburbs also lost power around 10.45 a.m. but it was quickly restored.
- Many Southland homes were also without power due to line damage from snow and trees. An outage at 7.53 a.m. affected 185 customers in the Mossburn area. There were also 111 customers affected in the Te Anau Downs area after an outage at 7.05 a.m. In Mataura another outage occurred about 11.45 a.m., affecting 141 customers. There was also two Transpower circuit outages affecting Powernet's Frankton network. These circuits tripped due to heavy snow, and 1416 customers were affected.
- More than 30 flights into and out of Queenstown Airport were cancelled due to snow.
- Snow and ice warnings for roads were in place for many parts of the South, including alpine passes, the Crown Range Road linking Queenstown and Wanaka and the Kawarau Gorge.
- The Milford Road (SH94) remained shut for the day due to a high avalanche risk and extensive tree falls and snow on the road.
- The Haast Pass (SH6) and the Lindis Pass (SH8) were both closed however the Lindis was reopened at 11.52 a.m., with drivers advised to slow down and take care.

- Glenorchy Rd was closed due to fallen trees and damaged powerlines. The road remained closed overnight.
- Queenstown traffic signals went out at the Shotover/Stanley St intersection.
- Several vehicles on the Crown Range Rd were snowed in and commuters were being urged to use chains.
- Local Queenstown ski fields received their largest snow fall of the year. Treble Cone received 70 cm of snow over 48 hours, Cardrona and Coronet Peak received 60 cm, while The Remarkables received 50 cm. Ski fields were forced to close for the day to deal with the snow. On 19 September, more than 3000 people reportedly took to the slopes at Coronet peak.

On 26 September, snow fell to 300 m in some parts of Otago and Southland. Drivers were warned of snow and ice on SH87 Kyeburn to Mosgiel, and snow on SH94 Te Anau to Milford Sound in Southland.

Cloud and Fog

On 1 September, fog blanketed the North Island and caused flight delays and cancellations from Gisborne through to Auckland. For Auckland, 41 domestic flights were cancelled while 37 domestic and 1 international flight were delayed. This was the third consecutive day of fog-related cancellations for the Auckland Airport.

On 20 September, a blanket of heavy fog covered much of Christchurch early in the morning, resulting in flights being grounded at about 7.30 a.m. Jetstar, SoundsAir and Air New Zealand flights were among those affected, with 17 incoming and outgoing flights being hampered by the fog at 8.30 a.m. Incoming flights from Palmerston North, Auckland, Dunedin, Invercargill, Nelson, Tauranga, Wellington, Hokitika and Napier had been either cancelled or delayed. Flights heading to Auckland, Dunedin, New Plymouth and Nelson were also cancelled.

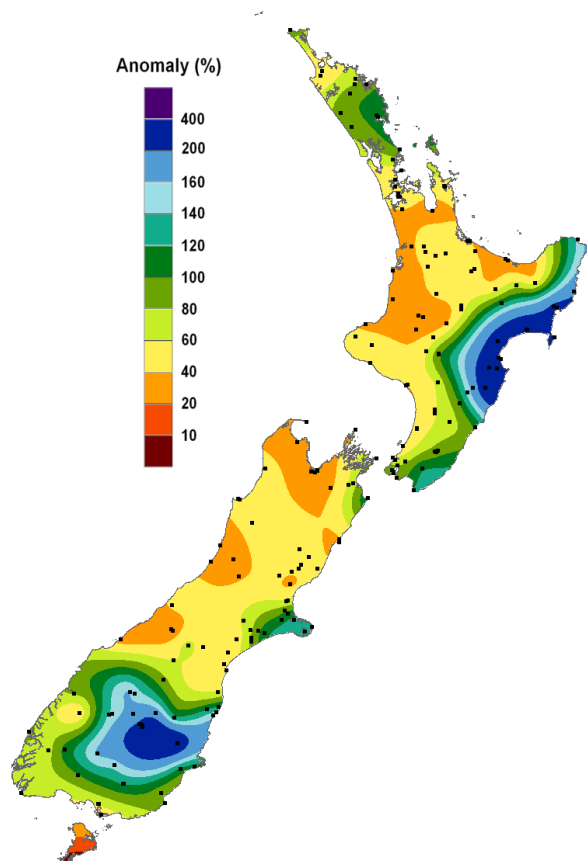
On 21 September, heavy fog forced the abandonment of 16 flights into and out of Hawke's Bay Airport. In some cases, Air New Zealand passengers flew over Hawke's Bay twice, only to be turned back to Auckland on both occasions.

Lightning and Hail

On September 25, a brief storm passing over the Marlborough region delivered 64 lightning strikes along with heavy rain between 1:00 a.m. and 3:00 a.m.

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

September rainfall was above or well above normal for much of the eastern North Island and for Otago to inland Southland (blue shades).

In contrast, many remaining locations experienced below or well below normal rainfall for the time of year (yellow-orange shades).

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