

A mild and dry month for much of the country

Temperature	Temperatures were near average ($\pm 0.50^{\circ}\text{C}$ of average) for much of the country, with below average temperatures (0.51°C to 1.20°C below average) for parts of the lower North Island, eastern Canterbury, and the southern South Island. Temperatures were above average (0.51°C to 1.20°C above average) in parts of Northland, Auckland, Waikato, Bay of Plenty, and the West Coast.
Rainfall	Rainfall was below normal (50-79% of normal) or well below normal (<50% of normal) for much of the South Island, southern and western parts of the North Island, and Gisborne. In contrast, rainfall was above normal (120-149% of normal) or well above normal (>149% of normal) in eastern parts of Northland, Waikato, Bay of Plenty, and inland parts of Otago and Southland.
Soil Moisture	At the end of the month, and for the time of year, soil moisture levels were lower than normal in Nelson, northern and central parts of Canterbury, and northwestern Otago. Soil moisture was higher than normal in parts of eastern Northland, Auckland, Waikato, and northern Hawke's Bay. Soil moisture was typically near normal elsewhere.

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Overview

October 2022 was characterised by higher than normal mean sea level pressure (MSLP) over and to the southwest of Aotearoa New Zealand. Moderate La Niña conditions and a negative Indian Ocean Dipole (IOD) also continued to influence New Zealand's climate. The Southern Annular Mode (SAM) was also positive for the majority of October. The SAM is a proxy for the location of a belt of westerly winds that encircle the South Ocean and occasionally protrude into the mid-latitudes. Usually, a positive SAM can indicate calmer and drier conditions for New Zealand.

The combination of these climate influences produced more easterly airflows than normal in the North Island, and slightly more southerly airflows than normal in the South Island. The month started on an exceptionally cold note for much of the country, as a polar southerly outbreak delivered temperatures akin to mid-winter, and snow to very low elevations (see the [highlights and extreme events](#) section for more details). In contrast, relatively high temperatures were common during the second-half of October, with record and near-record high daily maximum and minimum temperatures occurring on 23 and 29 October.

The cold start and warm end to the month resulted in near average October temperatures ($\pm 0.50^{\circ}\text{C}$ of average) for most of the country overall. However, there were some exceptions, with pockets of relatively low and high October temperatures observed in some areas. Specifically, temperatures were below average (0.51°C to 1.20°C below average) in parts of Wairarapa, Levin, and eastern Canterbury, as well as southern and inland parts of Otago and Southland. In contrast, temperatures were above average (0.51°C to 1.20°C above average) in much of Northland, Auckland, northern Waikato, Bay of Plenty, and isolated parts of the West Coast. Overall, the nationwide average temperature for October 2022 was 12.2°C (0.2°C above the 1981-2010 October average).

Rainfall patterns across the country were mixed, although it was a relatively dry month in many parts of the country. For much of the South Island, rainfall was below normal (50-79% of normal) or well below normal (<50% of normal), although above normal rainfall (120-149% of normal) was observed about some inland parts of Otago and Southland. In the North Island, rainfall was below normal or well below normal for much of Wellington, Wairarapa, Kāpiti Coast, Manawatū, southern and inland Taranaki, and Gisborne. Rainfall was above normal or well above normal (>149% of normal) in eastern parts of Northland, inland and eastern parts of Waikato, and western Bay of Plenty.

Further Highlights:

- The highest October temperature was 28.8°C , observed at Akaroa and Hanmer Forest on 23 October.
- The lowest October temperature was -7.3°C , observed at Manapouri Airport on 6 October.
- The highest 1-day rainfall was 109 mm, recorded at Arthur's Pass on 29 October.
- The highest wind gust was 174 km/h, observed at Cape Turnagain on 20 October.
- Of the six main centres, Auckland was the warmest, Christchurch was the driest and sunniest, Hamilton was the wettest and least sunny, and Dunedin was the coldest.
- Of the available, regularly reporting sunshine observation sites, the sunniest four regions in 2022 so far are Taranaki (2137 hours), Bay of Plenty (2084 hours), Wider Nelson (2031 hours), and inland Canterbury (2001 hours).

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Temperature: Cold start and warm finish to the month

An outbreak of exceptionally cold temperatures occurred early in October as a lobe of the tropospheric polar vortex passed over New Zealand, sending a series of strong cold fronts across the country. This unseasonable outbreak and the resulting string of cold, frosty nights was so pronounced that by the middle of the month dozens of locations were tracking towards record or near-record low October mean temperatures. However, relatively high temperatures prevailed for most of the second half of the month, and meant that October mean temperatures ended up near average overall for much of the country.

Periods of high pressure over New Zealand contributed to periods of settled weather and clear skies, which resulted in relatively cool overnight temperatures for parts of the South Island due to enhanced radiative cooling. Nine locations in the South Island observed record or near-record low mean minimum air temperatures. Most notable was Invercargill, where the mean minimum temperature of 4.0°C was the lowest for October since the city's records began in 1905.

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				
Leigh	16.3	1.6	1966	3rd-highest
Secretary Island	11.6	0.7	1985	4th-highest
Low records or near-records				
None 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				
Matamata	19.2	1.4	1999	2nd-highest
South West Cape	13.3	1.0	1991	3rd-highest
Low records or near-records				
None 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				
Port Taharoa	12.3	1.5	1973	4th-highest
Low records or near-records				
Manapouri (Airport)	2.0	-1.7	1963	Lowest
Invercargill	4.0	-1.5	1905	Lowest
Middlemarch	2.3	-1.4	2000	2nd-lowest
Dunedin (Airport)	3.2	-1.3	1962	2nd-lowest
Clyde	2.9	-2.0	1978	2nd-lowest
Orari Estate	3.6	-1.4	1972	3rd-lowest
Lumsden	3.3	-1.2	1982	3rd-lowest
Balclutha	3.9	-1.6	1964	3rd-lowest
Windsor	3.6	-0.9	2000	4th-lowest

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.

Rainfall: A dry month for many parts of the country

Despite some changeable weather patterns during October, the prevalence of anomalously high pressure over the country resulted in a relatively dry month for many areas. It was especially dry for northern parts of the South Island, with Nelson and Blenheim receiving just 23% and 27% of their normal October rainfall, respectively. Appleby recorded 17% of normal October rainfall, making it the third-driest October there since records began in 1932.

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				
None observed				
Low records or near-records				
Arapito	100	43	1978	Lowest
Mt Ruapehu (Chateau)	189	68	2000	3rd-lowest
Appleby	13	17	1932	3rd-lowest
Waipara West	20	50	1973	4th-lowest

October climate in the six main centres

October temperatures were above average in Auckland, Tauranga, and Hamilton. It was a cool month in Christchurch where temperatures were below average. It was a wet month in Hamilton and Tauranga where well above normal rainfall was observed. Conversely, Wellington and Christchurch received below normal rainfall. Of the six main centres in October 2022, Auckland was the warmest, Christchurch was the driest and sunniest, Hamilton was the wettest and least sunny, and Dunedin was the coldest.

October 2022 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	13.7	+0.7	Above average
Wellington ^d	11.9	-0.1	Near average
Christchurch ^e	10.6	-0.8	Below average
Dunedin ^f	10.5	-0.4	Near average
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland ^a	109	120	Above normal
Tauranga ^b	135	151	Well above normal
Hamilton ^c	174	178	Well above normal
Wellington ^d	70	60	Below normal
Christchurch ^e	36	74	Below normal
Dunedin ^f	58	93	Near normal
Sunshine			
Location	Sunshine (hours)		
Auckland ^a	174		
Tauranga ^b	207		
Hamilton ^g	171 ²		
Wellington ^d	195		
Christchurch ^e	236		
Dunedin ^f	225		

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

² Missing two hours of data (10 a.m. – 12 p.m. 7 October 2022)

Highlights and extreme events

Temperatures

The highest October temperature was 28.8°C, observed at Akaroa and Hanmer Forest on 23 October.

The lowest October temperature was -7.3°C, observed at Manapouri Airport on 6 October.

From 4-5 October, the polar jetstream bucked northwards and over New Zealand. This resulted in a strong high pressure system to south of Tasmania and drove a series of polar fronts over New Zealand across 5-7 October. The cold snap was particularly severe for the time of year, as the surface airmass experienced in New Zealand derived from the deep Southern Ocean and Antarctic continent. Numerous locations observed record or near-record low daily maximum and minimum temperatures during this period, as listed in the tables below.

On 23 October, warm northwesterly winds brought high temperatures to parts of Canterbury. Hanmer Forest recorded a temperature of 28.8°C, its highest daily maximum temperature for October since records began in 1906.

From 29-31 October, a warm and humid northerly airflow covered the country. Dozens of locations observed record or near-record high daily maximum and daily minimum temperatures. Perhaps most notably, Nelson recorded a daily minimum temperature of 15.8°C on 29 October, making it the city's highest daily minimum temperature for October since records began in 1862.

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				
Takapau Plains	25.6	29th	1962	Highest
Dannevirke	25.1	29th	1951	Highest
Hanmer Forest	28.8	23rd	1906	Highest
Auckland (Airport)	23.5	28th	1959	2nd-highest
Puysegur Point	20.2	10th	1978	2nd-highest
Akaroa	28.8	23rd	1978	2nd-highest
Kaikohe	22.9	31st	1973	Equal 2nd-highest
Paeroa	25.2	29th	1947	3rd-highest
Windsor	26.9	23rd	2000	3rd-highest
Palmerston North	25.5	29th	1918	4th-highest
Wellington (Airport)	21.9	31st	1962	4th-highest
Lake Tekapo	25.1	23rd	1925	4th-highest
Whatawhata	23.0	29th	1952	Equal 4th-highest
Waikeria	23.6	29th	1957	Equal 4th-highest
Low records or near-records				
Castlepoint	6.5	6th	1972	Lowest
Puysegur Point	6.4	5th	1978	Lowest
Le Bons Bay	5.1	6th	1984	Lowest
Five Rivers	4.9	5th	1982	Lowest
Tapanui	2.5	5th	1900	Lowest

Gore	3.0	5th	1907	Lowest
Tiwai Point	6.6	5th	1972	Lowest
Oban (Stewart Island)	6.3	5th	1975	Lowest
Balclutha	5.2	5th	1972	Lowest
Nugget Point	4.4	5th	1972	Lowest
South West Cape	5.4	5th	1991	Lowest
Campbell Island	2.8	5th	1991	Lowest
Pukekohe	11.7	6th	1969	2nd-lowest
Taumarunui	9.3	6th	1947	2nd-lowest
Lower Retaruke	8.2	6th	1972	2nd-lowest
Mt Ruapehu (Chateau)	1.6	6th	2000	2nd-lowest
Ngawi	9.5	6th	1972	2nd-lowest
Ohakune	4.7	6th	1972	2nd-lowest
Whanganui	10.2	6th	1972	2nd-lowest
Westport	10.0	6th	1966	2nd-lowest
Dunedin (Airport)	7.1	5th	1972	2nd-lowest
Te Anau	4.3	5th	1973	2nd-lowest
Lumsden	5.1	5th	1982	2nd-lowest
Invercargill	5.9	5th	1905	2nd-lowest
Hāwera	9.9	6th	1977	Equal 2nd-lowest
Takapau Plains	6.3	6th	1972	3rd-lowest
Manapouri (West Arm Jetty)	4.0	5th	1972	3rd-lowest
Manapouri (Airport)	5.0	5th	1973	3rd-lowest
Roxburgh	6.6	5th	1950	Equal 3rd-lowest
Matamata	12.6	6th	1999	4th-lowest
Waiouru	3.1	6th	1972	4th-lowest
Auckland (Western Springs)	13.7	6th	1971	Equal 4th-lowest
Te Kuiti	11.8	6th	1959	Equal 4th-lowest
Dannevirke	7.2	6th	1951	Equal 4th-lowest
Hastings	10.7	6th	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
High records or near-records				
Cape Reinga	16.1	30th	1971	Highest
Kaitaia	17.6	29th	1948	Highest
Mokohinau	17.6	30th	1994	Highest
Auckland (Whenuapai)	17.1	30th	1951	Highest
Auckland (Western Springs)	17.7	30th	1971	Highest
Whitianga	17.8	30th	1971	Highest
Paeroa	17.4	30th	1971	Highest
Matamata	15.8	29th	1999	Highest
Te Puke	16.9	30th	1973	Highest
Whakatāne	17.9	30th	1975	Highest
Port Taharoa	17.1	29th	1974	Highest
Tūrangi	14.3	30th	1968	Highest

Castlepoint	17.8	30th	1972	Highest
Hicks Bay	16.8	30th	1972	Highest
Hastings	19.1	30th	1972	Highest
Palmerston North	16.6	30th	1940	Highest
Tākaka	15.6	29th	1978	Highest
Franz Josef	13.6	29th	1953	Highest
Nelson	15.8	29th	1862	Highest
Kaikōura	15.6	30th	1972	Highest
South West Cape	14.1	9th	1991	Highest
Leigh	16.8	30th	1966	Equal highest
Rotorua	15.6	30th	1972	Equal highest
Whakatu	18.2	30th	1972	Equal highest
Hāwera	15.3	29th	1977	Equal highest
Waiau	16.8	30th	1974	Equal highest
Kerikeri	17.4	30th	1952	2nd-highest
Kaikohe	16.3	30th	1973	2nd-highest
Whangaparāoa	16.3	29th	1982	2nd-highest
Tauranga	17.2	30th	1941	2nd-highest
Taupō	14.9	30th	1950	2nd-highest
Lower Retaruke	15.0	30th	1972	2nd-highest
Masterton	17.5	30th	1943	2nd-highest
Takapau Plains	15.0	30th	1972	2nd-highest
Napier	19.4	30th	1940	2nd-highest
Porirua	15.2	29th	1972	2nd-highest
Upper Hutt (Trentham)	16.0	30th	1972	2nd-highest
Ōkārīto	13.8	29th	1983	2nd-highest
Secretary Island	14.2	29th	1988	2nd-highest
Blenheim	16.9	30th	1947	2nd-highest
Te Kuiti	16.0	30th	1959	Equal 2nd-highest
Mt Ruapehu (Chateau)	9.9	30th	2000	Equal 2nd-highest
Reefton	14.4	29th	1972	Equal 2nd-highest
Haast	14.1	29th	1949	Equal 2nd-highest
Brothers Island	14.1	30th	1997	Equal 2nd-highest
Auckland (Māngere)	17.2	30th	1961	3rd-highest
New Plymouth	15.8	29th	1944	3rd-highest
Ohakune	13.0	29th	1972	3rd-highest
Whanganui	17.3	29th	1972	3rd-highest
Motueka	14.7	29th	1972	3rd-highest
Westport	15.2	29th	1966	Equal 3rd-highest
Puysegur Point	14.3	10th	1978	Equal 3rd-highest
Waipara	16.9	30th	1973	Equal 3rd-highest
Le Bons Bay	15.0	30th	1984	Equal 3rd-highest
Whangārei	17.1	30th	1967	4th-highest
Warkworth	16.5	29th	1966	4th-highest
Whatawhata	15.9	30th	1952	4th-highest
Hamilton (Airport)	16.0	30th	1946	4th-highest
Waikeria	15.7	30th	1972	4th-highest
Martinborough	16.3	30th	1986	4th-highest

Wellington (Kelburn)	14.5	30th	1931	4th-highest
Wellington (Airport)	15.6	30th	1972	4th-highest
Waiouru	12.2	30th	1972	4th-highest
Arapito	14.4	29th	1978	4th-highest
Paraparaumu	15.2	29th	1972	Equal 4th-highest
Stratford	13.5	30th	1972	Equal 4th-highest
Low records or near-records				
Whitianga	-1.8	7th	1962	Lowest
Paeroa	-1.8	7th	1947	Lowest
Matamata	-2.4	7th	1999	Lowest
Rotorua	-3.5	7th	1964	Lowest
Hamilton (Airport)	-2.9	7th	1946	Lowest
Waikeria	-2.8	7th	1957	Lowest
Te Kuiti	-2.5	7th	1959	Lowest
Taumarunui	-4.2	7th	1947	Lowest
Tūrangi	-4.4	7th	1968	Lowest
New Plymouth	-1.3	7th	1944	Lowest
Lower Retaruke	-3.3	7th	1966	Lowest
Westport	-0.6	6th	1937	Lowest
Greymouth	-1.8	6th	1947	Lowest
Ōkārito	-2.6	6th	1982	Lowest
Franz Josef	-2.1	6th	1953	Lowest
Haast	-3.4	6th	1949	Lowest
Arthurs Pass	-6.1	6th	1973	Lowest
Akaroa	-2.3	6th	1978	Lowest
Le Bons Bay	-1.3	6th	1984	Lowest
Middlemarch	-5.3	4th	2000	Lowest
Manapouri (Airport)	-7.3	6th	1963	Lowest
South West Cape	0.5	6th	1991	Lowest
Whatawhata	-0.3	7th	1952	Equal lowest
Clyde	-3.4	7th	1978	Equal lowest
Whakatāne	-0.6	7th	1975	2nd-lowest
Hamilton (Ruakura)	-2.0	7th	1906	2nd-lowest
Ngawi	3.8	7th	1972	2nd-lowest
Motueka	-1.4	7th	1956	2nd-lowest
Kaikōura	1.0	6th	1963	2nd-lowest
Wānaka	-3.0	6th	1955	2nd-lowest
Te Puke	0.0	7th	1973	Equal 2nd-lowest
Brothers Island	4.5	6th	1997	Equal 2nd-lowest
Gore	-2.8	25th	1907	Equal 2nd-lowest
Warkworth	1.6	7th	1966	3rd-lowest
Whangaparāoa	6.4	7th	1982	3rd-lowest
Mt Ruapehu (Chateau)	-6.4	7th	2000	3rd-lowest
Hicks Bay	2.1	7th	1969	3rd-lowest
Ohakune	-4.4	7th	1962	3rd-lowest
Arapito	-0.3	6th	1978	3rd-lowest
Puysegur Point	2.2	6th	1978	3rd-lowest
Appleby	-1.8	7th	1932	3rd-lowest

Tiwai Point	-0.2	6th	1970	3rd-lowest
Balclutha	-2.5	1st	1964	3rd-lowest
Hāwera	-0.4	7th	1977	Equal 3rd-lowest
Nugget Point	0.4	6th	1970	Equal 3rd-lowest
Castlepoint	1.2	6th	1972	4th-lowest
Tākaka	0.3	7th	1978	4th-lowest
Reefton	-2.9	7th	1960	4th-lowest
Richmond	-0.7	7th	1862	4th-lowest

Rain and slips

The highest 1-day rainfall was 109 mm, recorded at Arthur's Pass on 29 October.

From 1-3 October, approximately 20 slips were reported in Wellington city due to periods of steady rain.

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
Te Puke	98	1st	1973	Highest
Lower Retaruke	71	29th	1967	2nd-highest
Ohakune	67	29th	1961	2nd-highest
Tūrangi	66	1st	1968	3rd-highest
Rotorua	81	1st	1964	4th-highest

Wind

The highest wind gust was 174 km/h, observed at Cape Turnagain on 20 October.

On 5 October, more than 1300 homes in Porirua were affected by a power outage. The cause of the outage was thought to be a tree or branch being blown down onto power lines. Vehicles travelling on SH2 from Kaitoke to Featherston (Remutaka Hill) were warned to take extra care due to strong winds. Interislander and Bluebridge ferry crossings between the North and South Islands were cancelled due to large southerly swells.

On 29 October, gusts reaching over 90 km/h in Wellington forced the postponement of *Six60's* show that was scheduled to play at *Sky Stadium*. The show was performed the following day instead.

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
Puysegur Point	169	10th	1986	Equal highest
Secretary Island	132	10th	1994	4th-highest

Lightning, hail, and tornadoes

On 5 October, several lightning strikes were reported over inland parts of Southland at the same time as snowfall was occurring, a phenomenon known as thundersnow. Farther north, lightning and hail were reported in Christchurch, and later in Wellington, in association with the passage of a cold front.

On 29 October, 1,133 lightning strikes were recorded over Southland. The thunderstorms were associated with heavy downpours of rain in some parts, with isolated surface flooding issues reported in Invercargill, and Brydone (south of Gore). Thunderstorms also occurred over other parts of the country, with an additional 555 lightning strikes (107 of those over Auckland).

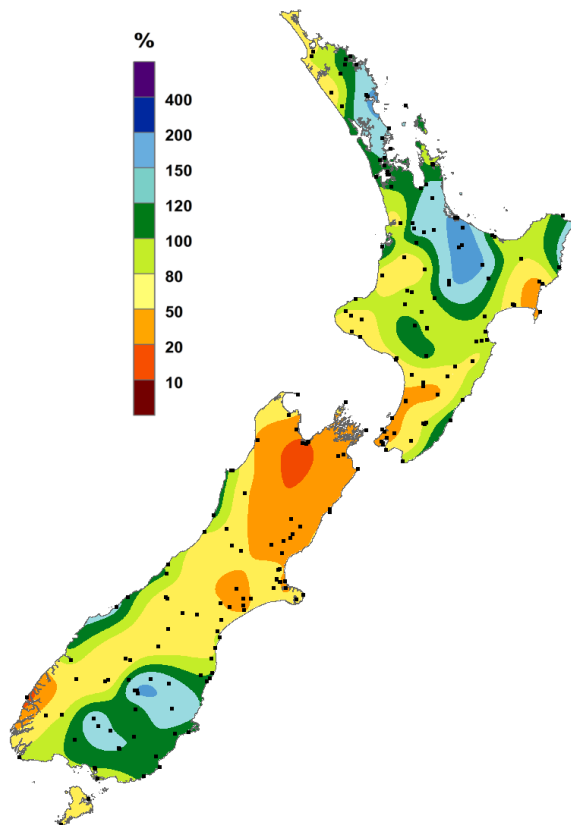
Snow and ice

Early on 5 October the first of several cold fronts passed over the South Island, delivering snowfall to near sea level in Southland, and to approximately 100 m above sea level in Canterbury during the morning. A second, much colder front passed over in the afternoon and evening, delivering snowfall to sea level for widespread parts of Southland, Otago and Canterbury. Overnight on 5 October through to the morning hours of 6 October, this second cold front passed over the North Island, delivering snow to low elevations about the lower North Island and Taranaki. The following list outlines some of the more notable observations of this snowfall event:

- Heaviest snowfalls were reported for inland and northern parts of Southland, where approximately 25-30 cm of snow was recorded down to elevations of approximately 300 m above sea level near Five Rivers and Garston. Snowfall was recorded at sea level along the southern coastline and in Rakiura Stewart Island.
- Dunedin motorists were asked to stay at home due to treacherous roads, particularly in the hill suburbs, with snowfall blanketing the city down to the beaches at sea level.
- Snow settled to low elevations in Wellington and the Manawatū, including reports of snow on Saddle Road, Pahiatua Track and in Kimbolton.
- Widespread snowfalls were reported in Taranaki, including at Stratford, Pembroke, Cardiff, Ngaere and Eltham.
- Numerous road closures were caused by the snowfall, including SH93 from Clinton to Mataura, SH1 from Dunedin to Palmerston, SH85 from Kyeburn to Palmerston, SH87 from Kyeburn to Outram, SH8 from Roxburgh to Alexandra, SH8 from Omarama to Tarras (Lindis Pass), SH75 from Little River to Barrys Bay, SH73 from Arthur's Pass to Otira, and the Desert Road (SH1).

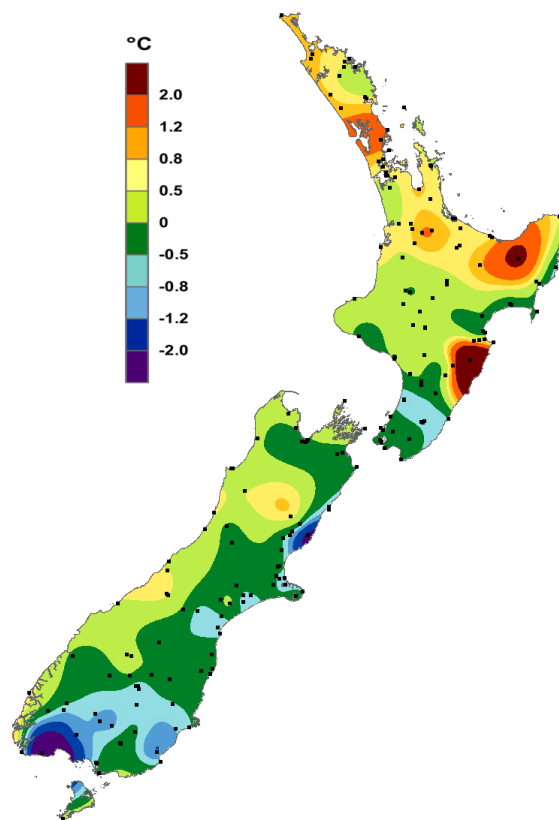
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October rainfall

Expressed as a percentage of the 1981-2010 normal.



October temperature

Expressed as a departure from the 1981-2010 average in degrees Celsius. Note that the very highest temperature anomalies (> 2.0°C above average) illustrated southeast of Whakatāne and in southern Hawke's Bay are a result of data quality issues at individual stations, and as such are not an accurate representation of monthly temperature for these areas. Similarly, the very lowest temperature anomalies (> 2.0°C below average) illustrated in southwest Southland and northeast coastal Canterbury have also resulted from data quality issues and do not accurately represent monthly temperatures observed in these areas.

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

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