NIWA NATIONAL CLIMATE CENTRE

Seasonal Climate Summary

NIWA Taihoro Nukurangi

Aotearoa New Zealand Climate Summary: **Autumn 2024** Issued: 6 June 2024

A cool and dry autumn for much of New Zealand

Temperature	Autumn temperatures were below average (-0.51°C to -1.20°C of average) across large portions of both islands, including parts of Auckland, Waikato, Bay of Plenty, the Central Plateau, Gisborne, Hawke's Bay, Taranaki, Manawatū-Whanganui, Wellington, Marlborough, West Coast, central Canterbury, interior Otago, and western Southland. Elsewhere, near average temperatures (±0.50°C of average) were observed. No areas experienced above average autumn temperatures.
Rainfall	It was a dry season for large swaths of New Zealand, with below normal (50-79% of normal) rainfall observed in eastern Northland, parts of Waikato, Bay of Plenty, the Central Plateau, southern Taranaki, much of the eastern and lower North Island, Nelson, Tasman, the upper West Coast, Canterbury, and northern Otago. Pockets of well below normal rainfall (<50% of normal) occurred in Tasman and northern Canterbury. Elsewhere, autumn rainfall was near normal (80-119% of normal), with the exception of small areas of above normal rainfall (120-149% of normal) in eastern Marlborough and western Southland.
Soil moisture	At the end of autumn, soils were drier than normal for northern, eastern, and inland parts of the South Island, and western and southern parts of the North Island from southern Taranaki to the Greater Wellington region (excluding Wellington city). Soils were wetter than normal about Mahia Peninsula.

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Overview

Autumn 2024 was characterised by higher than normal mean sea level pressure (MSLP) west of Aotearoa New Zealand and lower than normal MSLP south and east of the country (see Figure 1 below). This generally resulted in more southwesterly winds than normal, resulting in cooler than average seasonal temperatures and drier than normal conditions for much of the country.

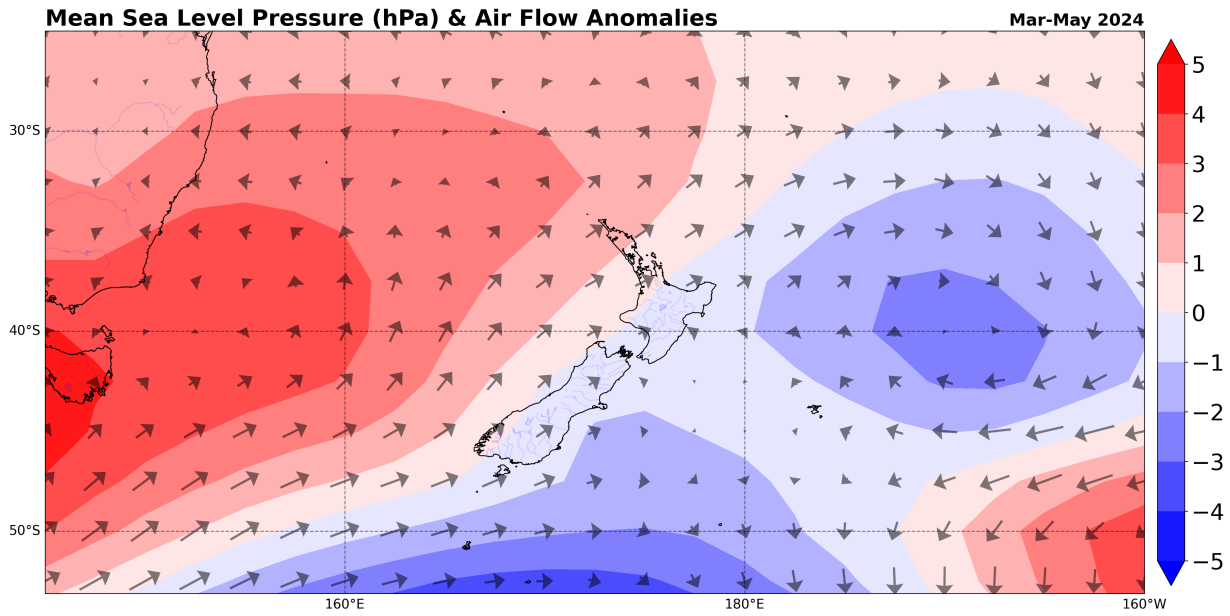

Figure 1: Mean sea level pressure anomalies (shaded) and air flow anomalies (streamlines) for autumn 2024.

The season was characterised by a weakening El Niño, which drove the southwesterly air flow anomaly from the Southern Ocean. In addition, New Zealand coastal water temperatures were slightly below average during autumn, which contributed to cooler air temperatures.

Overall, the nationwide average temperature for autumn 2024 was 12.8°C (0.6°C below the 1991-2020 average from NIWA's seven station temperature series which begins in 1909), making autumn 2024 the coolest autumn since 2012, and the 4th-coolest autumn since 2000.

However, the season did feature monthly variations in temperature. Autumn began on a very chilly note, as March 2024 was New Zealand's most unusually cold month since January 2014, and the coldest March since 2012. After near average temperatures in April, temperatures were well below average in May. In fact, May 2024 was the coldest May since 2009.

The prevailing southwesterlies during autumn resulted in occasional fronts impacting the lower South Island, West Coast, and western North Island, especially during March and April. However, regions in the upper and eastern portions of both islands were generally sheltered from these rains and observed a drier than normal season overall, including five locations that had their driest autumn on record.

An exception to the overall autumn rainfall pattern occurred in the eastern North Island in May, when a heavy rain event affected areas from Gisborne to Wairarapa from 20-21 May.

One of the most significant events during the season was an atmospheric river that brought high-impact weather to the country from 9-12 April (*an atmospheric river is a narrow corridor of concentrated moisture in the atmosphere, capable of carrying large amounts of water vapour*). Very heavy rain affected the West Coast, where high-elevation stations including Tuke Tuke and Cropp Waterfall received around 1,000 mm of rain, or about 10% of their annual normal rainfall in just three days. This resulted in slips and closed roads in the West Coast and Southland. In addition, between 10-12 April, 56 locations around the country observed record or near-record warm night-time temperatures as northerly winds brought a warm, humid air mass from the subtropics. (see the *Highlights and extreme events* section below for more details).

Further highlights for autumn 2024:

- The highest temperature was 32.6°C, observed at Clyde on 2 March.
- The lowest temperature was -9.7°C, observed at Cass (inland Canterbury) on 10 May.
- The highest 1-day rainfall was 265 mm, recorded at Milford Sound on 10 April.
- The highest wind gust was 178 km/h, observed at Cape Turnagain on 26 March.
- Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2024 so far are Marlborough (1265 hours), wider Nelson (1251 hours), Bay of Plenty (1220 hours) and Taranaki (1218 hours).
- Of the six main centres in autumn 2024, Auckland was the warmest, Christchurch was the coolest and driest, Hamilton was the wettest, Tauranga was the sunniest, and Dunedin was the least sunny.

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Temperature: The coolest autumn in New Zealand since 2012

The nationwide average temperature for autumn 2024 was 12.8°C (0.6°C below the 1991-2020 average from NIWA's seven station temperature series which begins in 1909), making autumn 2024 the coolest autumn since 2012. Since 2000, there have been only three cooler autumns than 2024: 2004, 2009, and 2012. Overall, it was only the 49th-coolest autumn on record, which speaks to the long-term warming trend that New Zealand is experiencing.

While no location observed a record low mean temperature for the season, 17 locations saw near-records. A southwesterly wind flow anomaly bringing in cool air masses from the Southern Ocean along with areas of high pressure resulted in chilly nights in particular. Four locations recorded their coolest mean nighttime temperature for autumn, including Appleby which has records dating back to 1932. Many other locations observed near-record cool mean nighttime temperatures.

The period of 8-12 May was the chilliest of the season, when Tūrangi and Whakatu both observed their coldest autumn night on record, and many other locations observed near-record cold nights.

Unusually for the past several years, no location set a record or near-record warm mean temperature for the season.

Record[1] or near-record mean air temperatures for autumn were recorded at:

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
None observed				
Low records or near-records				
Matamata	13.6	-0.6	1999	2nd-lowest
Pukekohe	13.7	-2.0	1969	2nd-lowest
Te Kuiti	13.1	-1.2	1959	2nd-lowest
Tūrangi	10.8	-1.3	1968	2nd-lowest
Ōkārito	11.7	-1.0	1982	2nd-lowest
Secretary Island	11.7	-1.0	1985	2nd-lowest
Pukaki	8.8	-0.9	1972	2nd-lowest
Te Anau	8.7	-1.0	1963	2nd-lowest
South West Cape	10.0	-0.9	1991	2nd-lowest
Waikeria	12.9	-1.6	1957	3rd-lowest
Mt Ruapehu (Chateau)	7.9	-0.7	2000	3rd-lowest
Whakatu	13.0	-0.7	1965	3rd-lowest
Windsor	10.3	-0.6	2000	3rd-lowest
Warkworth	14.6	-0.9	1966	4th-lowest
Hamilton (Airport)	13.3	-1.2	1946	4th-lowest
Taumarunui	11.9	-1.2	1947	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.

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
None observed				
Low records or near-records				
Pukekohe	18.2	-1.9	1969	2nd-lowest
Ōkārito	15.8	-1.2	1982	2nd-lowest
Secretary Island	14.6	-0.9	1985	2nd-lowest
Te Anau	13.1	-2.0	1963	2nd-lowest
South West Cape	12.1	-1.0	1991	2nd-lowest
Matamata	19.5	-0.6	1999	3rd-lowest
Port Taharoa	18.7	-1.1	1973	3rd-lowest
Waipounamu	15.0	-0.4	1980	3rd-lowest
Puysegur Point	13.4	-0.8	1978	4th-lowest
Tiwai Point	14.0	-0.7	1970	4th-lowest

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

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
None observed				
Low records or near-records				
Tūrangi	4.6	-1.5	1968	Lowest
Whakatu	5.5	-2.5	1965	Lowest
Appleby	5.3	-1.1	1932	Lowest
Winchmore	4.0	-2.0	1949	Lowest
Warkworth	9.5	-1.5	1966	2nd-lowest
Matamata	7.6	-0.7	1999	2nd-lowest
Te Kuiti	6.9	-1.6	1959	2nd-lowest
Takapau Plains	6.1	-1.3	1962	2nd-lowest
Secretary Island	8.8	-1.1	1985	2nd-lowest
Christchurch (Airport)	4.8	-1.9	1863	2nd-lowest
Pukaki	1.2	-1.5	1972	2nd-lowest
Windsor	3.8	-1.3	2000	2nd-lowest
Manapouri	3.1	-1.3	1963	2nd-lowest
Rotorua	7.3	-1.5	1964	3rd-lowest
Waikeria	6.4	-2.1	1957	3rd-lowest
Masterton	5.2	-1.6	1906	3rd-lowest
Martinborough	6.7	-1.3	1986	3rd-lowest
Medbury	3.5	-2.0	1927	3rd-lowest
Waiau	4.4	-1.3	1974	3rd-lowest
Mt Cook (Airport)	1.9	-1.6	1929	3rd-lowest

Rangiora	5.0	-1.3	1965	3rd-lowest
Orari	4.3	-1.6	1972	3rd-lowest
Cromwell	2.8	-2.0	1949	3rd-lowest
Clyde	2.2	-1.5	1978	3rd-lowest
South West Cape	7.9	-0.9	1991	3rd-lowest
Purerua	12.6	-0.8	1983	4th-lowest
Motu	5.5	-1.2	1990	4th-lowest
Taumarunui	5.7	-1.2	1947	4th-lowest
Mt Ruapehu (Chateau)	3.1	-0.8	2000	4th-lowest
Hastings	7.1	-2.0	1965	4th-lowest
Waiouru	3.6	-0.9	1962	4th-lowest
Ōkārito	7.6	-0.7	1982	4th-lowest
Timaru	3.8	-1.5	1885	4th-lowest
Tara Hills	2.0	-1.6	1949	4th-lowest
Wānaka	4.1	-1.3	1955	4th-lowest
Alexandra	3.1	-1.0	1929	4th-lowest

Rainfall: Dry in the north and east of both islands

Autumn 2024 was a generally dry season across New Zealand, evidenced by the fact that no location experienced record or near-record high seasonal rainfall, while five locations observed a record dry autumn and a further 11 locations saw near-record dry autumns. This included Waiau, which recorded a mere 53 mm of rainfall during the entire season, or just 29% of normal. In addition, Hanmer Forest had its second-driest autumn since records began there in 1905.

The season featured a weakening El Niño, leading to more southwesterly air flows than normal. This led to the west of both islands and the lower South Island generally receiving near-normal rainfall, while the eastern and upper portions of both islands were more sheltered from the moist air flows and thus particularly dry.

Record or near-record autumn 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				
Mt Ruapehu (Chateau)	219	35	2000	Lowest
Tākaka	152	32	1976	Lowest
Arapito	263	51	1978	Lowest
Waiau	53	29	1974	Lowest
Windsor	62	53	2000	Lowest
Mokohinau Island	151	61	1994	2nd-lowest
Paraparaumu	119	51	1945	2nd-lowest
Reefton	251	59	1960	2nd-lowest
Hanmer Forest	94	40	1905	2nd-lowest
Cheviot	71	42	1982	2nd-lowest

Appleby	91	39	1932	3rd-lowest
Culverden	55	37	1921	3rd-lowest
Rangiora	73	49	1965	3rd-lowest
Masterton	108	50	1926	4th-lowest
Greymouth	398	68	1947	4th-lowest
Akaroa	120	47	1977	4th-lowest

Autumn in the six main centres

Temperatures were below average in four of the six main centres, with Hamilton having its 4th-coolest autumn on record. Only Wellington and Dunedin observed near average temperatures. Four of the six main centres received below normal or well below normal rainfall, with the exception of Auckland and Hamilton, which were near normal. Of the six main centres in autumn 2024, Auckland was the warmest, Christchurch was the coolest and driest, Hamilton was the wettest, Tauranga was the sunniest, and Dunedin was the least sunny.

Autumn 2024 main centre climate statistics:

Temperature			
Location	**Mean temp. (°C)**	**Departure from normal (°C)**	**Comments**
Auckland[a]	15.8	-0.7	Below average
Tauranga[b]	15.4	-0.6	Below average
Hamilton[c]	13.3	-1.2	Below average (4th-coolest on record)
Wellington[d]	13.4	-0.5	Near average
Christchurch[e]	10.9	-1.2	Below average
Dunedin[f]	11.4	-0.4	Near average

Rainfall			
Location	**Rainfall (mm)**	**% of normal**	**Comments**
Auckland[a]	268	91	Near normal
Tauranga[b]	170[2]	49	Well below normal
Hamilton[c]	319	112	Near normal
Wellington[d]	283	76	Below normal
Christchurch[e]	85	53	Below normal
Dunedin[f]	110	62	Below normal

Sunshine	
Location	**Sunshine (hours)**
Auckland[a]	565
Tauranga[b]	656
Hamilton[g]	570
Wellington[d]	538
Christchurch[e]	559
Dunedin[f]	427[2]

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

[2] Missing one day of data

Highlights and extreme events

This section contains information pertaining to some of the more significant highlights and extreme events that occurred during autumn 2024. Note that a more detailed list of significant weather events for autumn 2024 can be found in the *Highlights and extreme events* section of NIWA's Monthly Climate Summaries. These monthly summaries are available online, and may be viewed here.

Temperatures

The highest temperature was 32.6°C, observed at Clyde on 2 March.

The lowest temperature was -9.7°C, observed at Cass (inland Canterbury) on 10 May.

Between 10-12 April, 56 locations around the country observed record or near-record warm night-time temperatures as northerly winds brought a warm, humid air mass from the subtropics.

From 8-12 May a period of high atmospheric pressure and clear skies dominated New Zealand after the passage of a cold southerly front. Heavy frosts were observed in many areas, with 20 locations registering record or near-record low daily minimum temperatures for May.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Purerua	26.8	Mar-1st	1983	Highest
Kaikohe	29.1	Apr-11th	1973	2nd-highest
Motu	27.0	Mar-13th	1990	2nd-highest
Pukaki	30.8	Mar-2nd	1972	2nd-highest
Middlemarch	31.8	Mar-2nd	2000	2nd-highest
Clyde	32.6	Mar-2nd	1978	2nd-highest
Tiri Tiri Lighthouse	25.4	Mar-13th	1982	3rd-highest
Grassmere Salt Works	29.9	Mar-2nd	1953	3rd-highest
Waipounamu	27.9	Mar-2nd	1980	3rd-highest
Ettrick	32.2	Mar-2nd	1950	3rd-highest
Alexandra	31.4	Mar-2nd	1992	4th-highest
Low records or near-records				
Tautuku	5.9	May-20th	1976	2nd-lowest
Motu	7.9	May-7th	1990	4th-lowest
Ōkārito	10.5	May-30th	1983	4th-lowest
Te Anau	4.1	May-20th	1973	Equal 4th-lowest

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
Low records or near-records				
Tūrangi	-6.3	May-8th	1968	Lowest
Whakatu	-4.6	May-12th	1965	Lowest

Waipawa	-4.3	May-12th	1945	Equal lowest
Whitianga	-2.5	May-10th	1962	2nd-lowest
Rotorua	-3.3	May-12th	1964	2nd-lowest
Taumarunui	-5.3	May-12th	1947	2nd-lowest
Appleby	-6.3	May-10th	1932	2nd-lowest
Medbury	-7.7	May-10th	1927	2nd-lowest
Christchurch (Airport)	-6.3	May-10th	1863	2nd-lowest
Cape Reinga	6.0	May-30th	1951	3rd-lowest
Martinborough	-2.9	May-10th	1986	3rd-lowest
Paraparaumu	-2.9	May-10th	1953	3rd-lowest
Cheviot	-5.9	May-10th	1982	3rd-lowest
Rangiora	-5.0	May-10th	1965	3rd-lowest
Manapouri	-5.7	May-9th	1963	3rd-lowest
Te Kuiti	-2.8	May-10th	1959	Equal 3rd-lowest
Motueka	-3.4	May-10th	1956	Equal 3rd-lowest
Matamata	-2.7	May-12th	1999	4th-lowest
Levin	-2.6	May-10th	1895	4th-lowest
Tākaka	-1.6	May-10th	1978	4th-lowest
Waiau	-6.4	May-10th	1974	4th-lowest
Windsor	-4.3	May-11th	2000	4th-lowest
Richmond	-3.3	May-10th	1862	Equal 4th-lowest
Middlemarch	-7.8	May-9th	2000	Equal 4th-lowest
High records or near-records				
Lake Tekapo	19.0	Mar-11th	1928	Highest
Peel Forest	17.7	Apr-10th	1973	3rd-highest
Akaroa	19.6	Apr-10th	1978	3rd-highest
Wairoa	20.1	Apr-12th	1972	4th-highest

Rain and slips

The highest 1-day rainfall was 265 mm, recorded at Milford Sound on 10 April.

A strong cold front hit the South Island on 25 March, resulting in heavy rainfall rates for parts of the west. Milford Sound observed 30 mm in an hour, the heaviest hourly rainfall rate in Milford Sound since January 2024, and the heaviest March hourly rainfall rate for Milford Sound in five years.

An atmospheric river brought heavy rain to the country from 9-12 April. On 9 April, SH6 was closed due to a slip between Haast and Fox Glacier, and then extended to Franz Josef on 10 April due to a second slip. Due to several downed power poles, emergency management warned Haast residents that they could face several days without power.

Air New Zealand cancelled nearly 50 domestic flights on 11 April due to adverse weather conditions. On 12 April, more than 20 flights into and out of Auckland were either cancelled or delayed due to heavy rain and strong winds.

During the multi-day April event, high-elevation stations in the West Coast including Tuke Tuke and Cropp Waterfall received around 1,000 mm of rain, or about 10% of their annual normal in just three days.

From 20-21 May, heavy rainfall occurred over northern and eastern parts of New Zealand. Fire and Emergency NZ received approximately 70 calls about weather-related events in Auckland, with homes flooded in St Heliers and Mount Wellington. Farther south, residents of Western Rd, Ngongotahā (western side of Lake Rotorua) were advised to evacuate due to surface flooding caused by the Ngongotahā Stream. A person needed rescuing near Ngakuru (south of Rotorua) as rising floodwaters trapped them in their vehicle. SH2 was closed between Wairoa and Bartletts due to flooding. Surface flooding was reported in parts of Christchurch, including Marine Parade in New Brighton.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Māhia	63	May-21st	1990	2nd-highest
Lake Moeraki	162	Apr-9th	1985	3rd-highest
Linkwater	160	Apr-11th	1938	3rd-highest
Pukaki	39	Apr-11th	1972	3rd-highest
Roxburgh	49	Apr-11th	1946	4th-highest

Drought and dryness

On 14 March, Agriculture Minister Todd McClay classified the drought conditions in the Marlborough, Tasman, and Nelson districts as a medium-scale adverse event, following months of low rainfall and acknowledging the challenging conditions facing farmers and growers in the district. Two weeks later on 28 March, the medium-scale adverse event was extended to parts of the North Island, including Northland, Taranaki, Horizons, Greater Wellington, and Wairarapa.

Wind

The highest wind gust was 178 km/h, observed at Cape Turnagain on 26 March.

A series of powerful cold fronts crossed New Zealand in early March. Between 4 and 5 March, gusts reached as high as 111 km/h at Wellington Airport, 105 km/h at Kelburn, 107 km/h at Waipara West, 100 km/h at Le Bons Bay, as well as a 144 km/h wind gust at Mount Cook Airport. A truck's trailer was blown over due to the wind on Remutaka Hill. NZTA warned Auckland commuters to take care on the Harbour Bridge due to high winds.

On 11 April, high winds in Auckland resulted in trees and powerlines coming down, along with reports of roofs being lifted. Power outages were reported in several suburbs.

On 25 April, strong winds cancelled six flights at Wellington Airport, while the National Anzac Day Commemoration was also cancelled and a reduced service was moved indoors.

On 29 May, strong winds struck the upper North Island. Power outages caused by fallen trees affected at least 50,000 customers across Auckland and Waikato.

Record or near record autumn extreme wind gusts were recorded at:

Location	Extreme wind gust (km/h)	Date of extreme gust	Year records began	Comments
Auckland (Whenuapai)	113	May-29th	1972	Highest
Te Kuiti	63	May-29th	2003	Highest
Tūrangi	127	May-17th	1973	Highest
Mt Cook (Airport)	145	Mar-4th	2000	Highest
Pukekohe	81	May-29th	1986	2nd-highest
Secretary Island	152	May-29th	1994	2nd-highest
Middlemarch	108	Apr-25th	2000	2nd-highest
Mokohinau Island	117	May-29th	1994	3rd-highest
Queenstown	93	May-8th	1972	3rd-highest
Alexandra	109	May-29th	2001	3rd-highest
South West Cape	176	Mar-10th	1991	3rd-highest
Auckland (Western Springs)	78	May-29th	1994	4th-highest
Waiouru	106	Apr-11th	1970	4th-highest
Oamaru	93	May-8th	1984	4th-highest
Tara Hills	83	Mar-4th	1985	4th-highest
Gore	107	Mar-10th	1987	4th-highest

Snow and ice

On 18 May, snow settled down to approximately 350 m above sea level over the lower South Island. Approximately 40 cm of snow was reported in Mount Cook Village, with 12 cm reported in St Bathans. The Remarkables and Coronet Peak ski fields near Queenstown reported 20 cm of snow, respectively.

Lightning, hail, and tornadoes

On the morning of 26 April, Bluff was hit by a hailstorm which left accumulating hailstones on the ground. Later in the day, a severe thunderstorm moved through the Christchurch area, bringing large hail to several locations, including Belfast, Woodend, and Christchurch Airport.

On 29 May, thunderstorms struck Auckland with hail being reported across parts of the city.

Cloud and fog

On 16 April, four flights bound for Christchurch were delayed by fog at Christchurch Airport, while three outbound flights were also delayed.

On 20 April, seven flights into and out of Christchurch Airport were cancelled due to fog.

On 23 May, fog at Dunedin Airport caused disruption to several flights.

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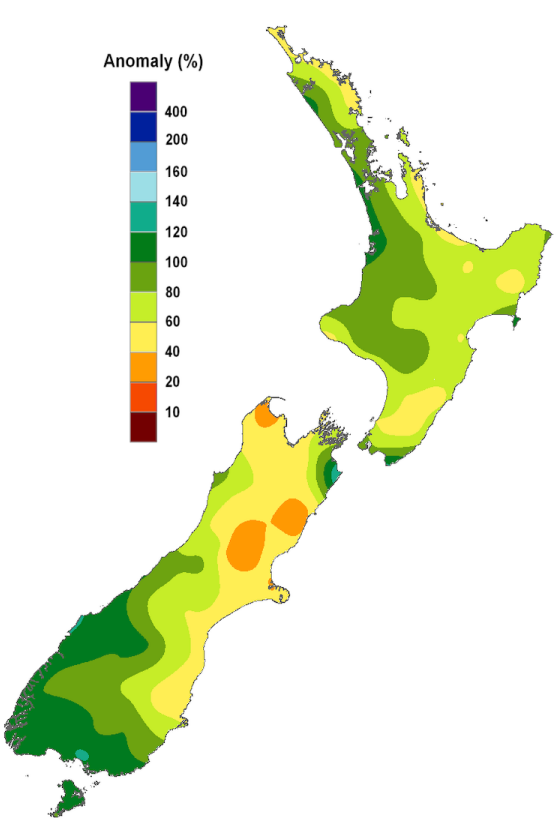
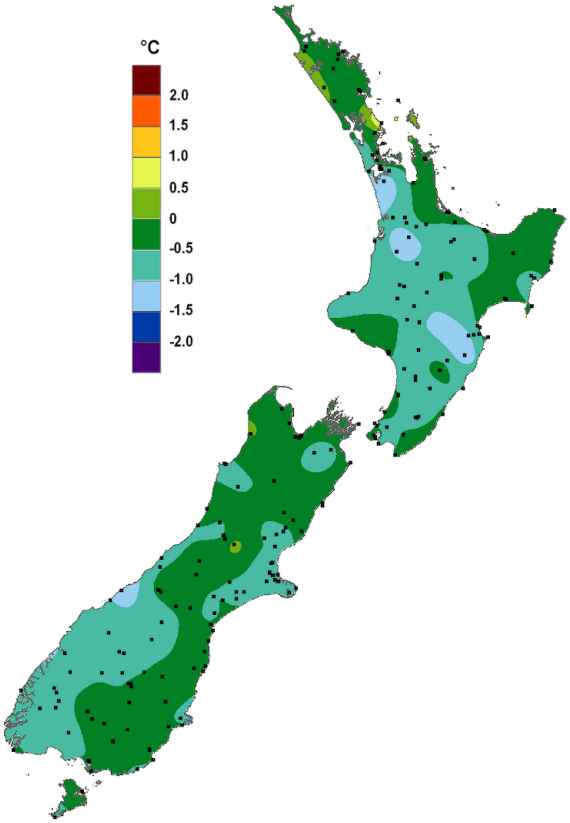


Autumn rainfall
Expressed as a percentage of the 1991-2020 normal.



Autumn temperature
Expressed as a departure from the 1991-2020 average in degrees Celsius.

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