

New Zealand's equal-second warmest autumn on record

Temperature	Autumn 2022 was the equal-2 nd warmest autumn on record in Aotearoa New Zealand. Temperatures were well above average (>1.20°C above average) across the West Coast, Southland, Otago and the Canterbury high country, as well as large parts of Auckland, Northland, northern Waikato and eastern Wellington. Temperatures were otherwise above average (+0.51°C to +1.20°C of average) elsewhere, except for small pockets of the east coast of both the North and South Islands where temperatures were near average ($\pm 0.50^\circ\text{C}$ of average).
Rainfall	Autumn rainfall was above normal (120-149% of normal) for pockets of Hawke's Bay, Gisborne and Northland, with a small area of well above normal (>149% of normal) around eastern Wairoa. Below normal rainfall (50-79% of normal) was observed in parts of Far North, Kaipara, Auckland, Waikato, South Wairarapa, and parts of Canterbury and Otago, while well below normal rainfall (<50% of normal) was observed about Waitaki, Dunedin, Banks Peninsula and Selwyn.
Soil moisture	At the end of May, drier than normal soils were prominent for Otago, eastern and inland Canterbury about and south of Christchurch, southern Wairarapa, northern Waikato, Auckland, and eastern and northern parts of Northland. Soils were wetter than normal for the parts of Manawatū-Whanganui, Hawke's Bay and coastal Gisborne.

Click on the link to jump to the information you require:

[Overview](#)

[Temperature](#)

[Rainfall](#)

[Autumn in the six main centres](#)

[Highlights and extreme events](#)

Overview

Autumn 2022 was characterised by higher-than-normal air pressure over much of Aotearoa New Zealand and east of the country, typical of La Niña. This resulted in an easterly flow anomaly.

The Southern Annual Mode (SAM), a proxy for the strength and location of the westerly winds that bring colder temperatures and wetter conditions to parts of New Zealand, was in its positive phase 66% of the time in autumn. This contributed to a lack of cold frontal systems, and when combined with easterly flow anomalies, caused several dry and sunny spells in the West Coast, Southland, Otago and Canterbury high country. This was also the case for Waikato and Auckland where soil moisture levels were well below normal during May.

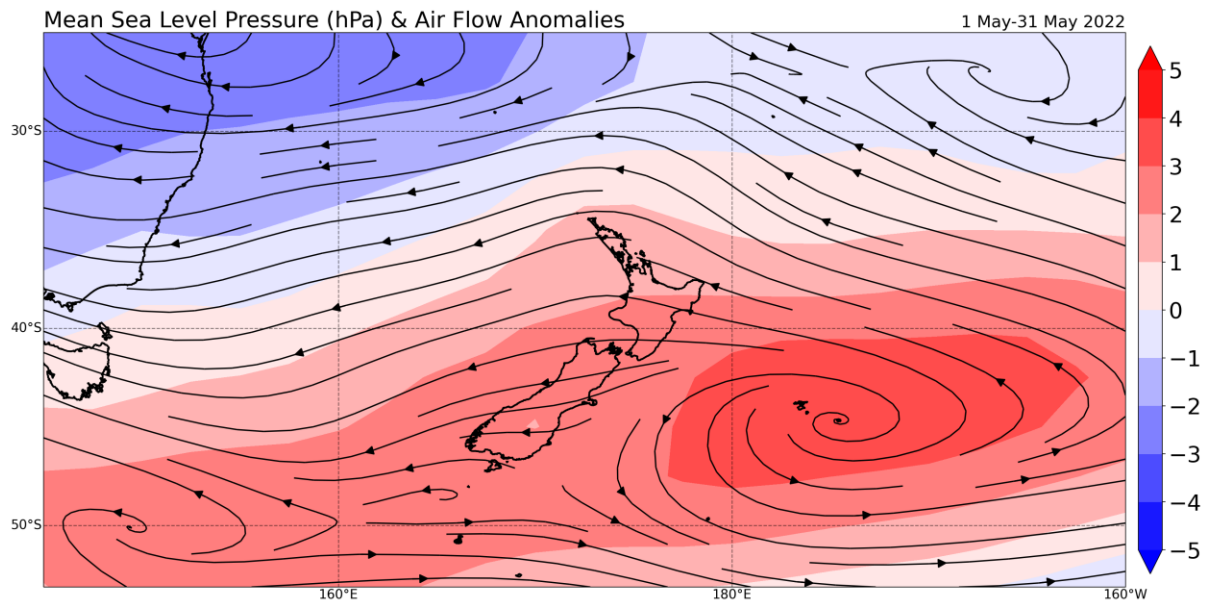


Figure 1: Mean sea level pressure anomalies (coloured) and airflow anomalies (streamlines) throughout autumn.

The nationwide average temperature for autumn 2022 was 14.7°C (1.4°C above the 1981-2010 average from NIWA’s seven station temperature series which begins in 1909), making autumn 2022 the equal-second warmest autumn on record.

The warmth on land was matched by the warmth at sea. Coastal waters around New Zealand were also exceptionally warm, continuing a prolonged marine heatwave (MHW) event. For the autumn season as a whole, sea surface temperatures (SSTs) were the warmest on record in the west of the South Island (2.6°C above average), north of the South Island (1.8°C above average), east of the South Island (1.7°C above average), and second-warmest on record in the north and west of the North Island (1.5°C above average) since autumn 1982.

The exceptionally warm autumn that the country experienced can be attributed to the record and near-record warm SSTs, higher-than-normal pressure, a persistently positive SAM, and global climate change.

Rainfall was more patchy across the season, with bursts of heavy rain events interspaced by long dry spells. In March, heavy rain hit parts of Northland, Auckland and Gisborne in a series of thunderstorms. A new national hourly rainfall record for a low-elevation station (less than 500 above sea level) was set at Maungatapere near Whangārei, where 103 mm of rain was recorded from 4 a.m. – 5 a.m. on March 21. In contrast to this, meteorological drought that had developed in late summer in Southland worsened in March, before easing at the beginning of May. At the end of the season, a series of low pressures systems battered New Zealand, leading thunderstorms, a likely tornado in Levin, as well crop damaging hail. See the *Highlights and extreme events* section for more details.

Further highlights for autumn 2022:

- The highest temperature was 30.6°C, observed at Whatawhata on 9 and 15 March.
- The lowest temperature was -6.9°C, observed at Middlemarch on 28 May.
- The highest 1-day rainfall was 226 mm, recorded at Milford Sound on 20 April.
- The highest wind gust was 193 km/h, observed at Cape Foulwind on 20 May.

- Of the six main centres in autumn 2022, Auckland was the warmest, Christchurch was the coolest, Hamilton was the sunniest, Wellington was the least sunny, Tauranga was the wettest, and Dunedin was the driest.
- Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2022 so far are Taranaki (1290 hours), Bay of Plenty (1203 hours), Greater Nelson (1194 hours) and Kāpiti Coast (1170 hours).

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Temperature: Exceptionally warm throughout all of autumn

The nationwide average temperature for autumn 2022 was 14.7°C (1.4°C above the 1981-2010 average from NIWA's seven station temperature series which begins in 1909), making autumn 2022 the equal-second warmest autumn on record tied with 2016, with the warmest autumn still occurring in 1938.

Notably, each month of autumn had nationwide average temperature anomalies in excess of 1.2°C. March was the 8th-warmest on record, April was the 9th-warmest on record and May was the 3rd-warmest on record.

During autumn, exceptionally high mean temperature anomalies occurred on the West Coast, Canterbury high country, Southland and Otago, where autumn mean maximum, mean minimum and mean air temperatures anomalies were widespread in excess of 2°C, with some areas experiencing mean maximum temperature anomalies in excess of 3°C, including Franz Josef and Greymouth. This can be attributed to easterly wind anomalies bringing drier air to the West Coast, Otago and Southland, leading to extended periods of sunshine and dryness in March and April. Working in tandem with this, SST anomalies off the South Island's northern, western and southern coasts were consistently between 1-2°C above the average throughout the entire season. Additionally, warm subtropical air frequented the New Zealand region due to an active La Niña.

Overall, mean air, mean maximum and mean minimum temperatures were all exceptionally high. During autumn, there were 67 locations that experienced record or near-record mean temperatures, 79 locations that experienced record or near-record mean maximum temperatures, and 37 locations that experienced record or near record mean minimum temperatures. As has become a recurring theme, there were no record or near-record low mean temperatures.

Record¹ 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				
Greymouth	15.5	2.7	1947	Highest
Castlepoint	17.3	2.6	1972	Highest
Franz Josef	14.1	2.5	1953	Highest
Westport	15.6	2.4	1937	Highest
Haast	14.3	2.3	1949	Highest
Hokitika	14.7	2.3	1866	Highest
Queenstown	12.8	2.3	1871	Highest
Leigh	19.5	2.2	1966	Highest
Ōkārito	14.7	2.2	1982	Highest
Puysegur Point	13.9	2.2	1978	Highest
Secretary Island	14.7	2.2	1985	Highest
Oban (Stewart Island)	12.5	2.1	1975	Highest

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.

Taupō	14.3	2.1	1949	Highest
Arapito	15.3	2.0	1978	Highest
Invercargill	12.2	1.9	1905	Highest
Milford Sound	12.9	1.9	1934	Highest
Mt Cook Village	11.2	1.9	1929	Highest
Te Anau	11.8	1.9	1963	Highest
Middlemarch	11.7	1.7	2000	Highest
Whangaparāoa	18.5	1.6	1982	Highest
Kerikeri	17.7	1.4	1945	Highest
Porirua	15.0	1.0	1968	Highest
Campbell Island	8.4	0.9	1991	Highest
Reefton	13.9	2.1	1960	2nd-highest
Wānaka Airport	12.6	2.0	1955	2nd-highest
Gore	11.9	1.9	1907	2nd-highest
Roxburgh	12.7	1.9	1950	2nd-highest
Dunedin (Musselburgh)	13.3	1.7	1947	2nd-highest
Manapouri (West Arm Jetty)	11.1	1.7	1971	2nd-highest
Ranfurly	10.7	1.7	1897	2nd-highest
Tiwai Point	12.7	1.7	1970	2nd-highest
Christchurch (Botanic Gardens)	13.9	1.6	1863	2nd-highest
Kaitia	18.4	1.6	1948	2nd-highest
Te Puke	16.2	1.6	1973	2nd-highest
Windsor	12.2	1.6	2000	2nd-highest
Auckland (Whenuapai)	17.1	1.5	1945	2nd-highest
Five Rivers	11.4	1.5	1982	2nd-highest
Nugget Point	12.2	1.5	1970	2nd-highest
Tauranga	17.2	1.5	1913	2nd-highest
Whitianga	16.8	1.5	1962	2nd-highest
Auckland (Airport)	17.8	1.4	1959	2nd-highest
Mokohinau	18.9	1.4	1994	2nd-highest
Whangārei	18.0	1.4	1967	2nd-highest
New Plymouth	15.9	1.3	1944	2nd-highest
Rotorua	14.7	1.3	1964	2nd-highest
Ngawi	16.3	1.2	1972	2nd-highest
Whatawhata	16.6	1.9	1952	3rd-highest
Hamilton (Ruakura)	16.2	1.7	1906	3rd-highest
Cromwell	12.4	1.6	1949	3rd-highest
Auckland (Māngere)	17.6	1.4	1959	3rd-highest
Hicks Bay	17.2	1.3	1969	3rd-highest
Kaikohe	17.0	1.3	1973	3rd-highest
Lumsden	11.2	1.3	1982	3rd-highest
Mt Ruapehu (Chateau)	9.6	1.3	2000	3rd-highest
Hāwera	14.5	1.2	1977	3rd-highest
Port Taharoa	17.4	1.2	1973	3rd-highest
Auckland (Western Springs)	17.8	1.7	1948	4th-highest
Matamata	15.7	1.7	1999	4th-highest
Akaroa	14.5	1.5	1978	4th-highest
Hanmer Forest	12.2	1.5	1906	4th-highest

Waiouru	11.0	1.4	1962	4th-highest
Stratford	13.8	1.3	1960	4th-highest
Whakatāne	16.3	1.3	1974	4th-highest
Rangiora	13.0	1.2	1965	4th-highest
Tākaka	14.3	1.2	1978	4th-highest
Waiau	12.9	1.2	1974	4th-highest
Wellington (Kelburn)	14.9	1.2	1928	4th-highest
Alexandra	12.1	1.1	1929	4th-highest
Low records or near-records				
None observed				

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				
Franz Josef	19.4	3.1	1953	Highest
Whatawhata	22.6	3.1	1952	Highest
Cromwell	20.1	3.0	1949	Highest
Greymouth	19.7	3.0	1947	Highest
Manapouri (Airport)	17.7	2.9	1963	Highest
Taupō	20.1	2.9	1949	Highest
Middlemarch	19.2	2.7	2000	Highest
Queenstown	18.3	2.7	1871	Highest
Castlepoint	20.2	2.6	1972	Highest
Ranfurly	18.0	2.6	1897	Highest
Wānaka	18.9	2.6	1955	Highest
Haast	18.3	2.5	1949	Highest
Invercargill	17.3	2.5	1905	Highest
Reefton	19.5	2.5	1960	Highest
Taumarunui	21.3	2.5	1947	Highest
Mt Cook Airport	16.9	2.4	1929	Highest
Secretary Island	17.7	2.4	1985	Highest
Five Rivers	17.5	2.3	1982	Highest
Mt Ruapehu (Chateau)	15.1	2.3	2000	Highest
Ōkārito	19.1	2.3	1982	Highest
Puysegur Point	16.3	2.3	1978	Highest
Te Kuiti	22.0	2.3	1959	Highest
Westport	19.3	2.3	1937	Highest
Matamata	22.1	2.2	1999	Highest
Oban (Stewart Island)	16.2	2.2	1975	Highest
Milford Sound	17.5	2.1	1934	Highest
Rotorua	19.8	2.1	1964	Highest
Stratford	19.0	2.1	1960	Highest
Auckland (Airport)	22.0	2.0	1959	Highest
New Plymouth	20.4	2.0	1944	Highest
Tūrangi	19.7	2.0	1968	Highest

Waikeria	22.1	2.0	1957	Highest
Arapito	20.1	1.9	1978	Highest
Hamilton (Airport)	21.8	1.9	1946	Highest
Manapouri (West Arm Jetty)	15.0	1.9	1971	Highest
Whitianga	22.1	1.9	1962	Highest
Windsor	18.4	1.9	2000	Highest
Whangaparāoa	21.5	1.8	1982	Highest
Lower Retaruke	20.3	1.7	1966	Highest
Paeroa	22.1	1.7	1947	Highest
Auckland (Whenuapai)	21.9	1.6	1945	Highest
Tākaka	20.4	1.6	1978	Highest
Whakatāne	21.8	1.5	1974	Highest
Porirua	19.1	1.3	1968	Highest
Te Puke	21.1	1.3	1973	Highest
Campbell Island	10.3	0.7	1991	Highest
Hokitika	19.3	2.8	1866	2nd-highest
Clyde	19.5	2.5	1978	2nd-highest
Lake Tekapo	17.6	2.4	1927	2nd-highest
Auckland (Māngere)	22.0	2.1	1959	2nd-highest
Levin	20.1	1.9	1895	2nd-highest
Te Anau	16.8	1.9	1963	2nd-highest
Alexandra	19.6	1.8	1929	2nd-highest
Paraparaumu	19.3	1.6	1953	2nd-highest
Ngawi	19.6	1.5	1972	2nd-highest
Whangārei	22.2	1.5	1967	2nd-highest
Nugget Point	15.3	1.4	1970	2nd-highest
Hāwera	18.7	1.3	1977	2nd-highest
Port Taharoa	21.1	1.3	1973	2nd-highest
Mokohinau	20.6	1.2	1994	2nd-highest
Gore	17.3	2.9	1907	3rd-highest
Lauder	18.5	2.5	1924	3rd-highest
Hamilton (Ruakura)	22.2	2.4	1906	3rd-highest
Hanmer Forest	20.0	2.4	1906	3rd-highest
Tiwai Point	16.4	2.1	1970	3rd-highest
Waiouru	16.3	2.0	1962	3rd-highest
Lumsden	17.0	1.8	1982	3rd-highest
Palmerston North	20.2	1.8	1928	3rd-highest
Tauranga Airport	21.5	1.5	1913	3rd-highest
Leigh	22.9	2.9	1966	4th-highest
Auckland (Western Springs)	22.3	2.2	1948	4th-highest
Waipawa	20.3	1.7	1945	4th-highest
Dunedin (Airport)	18.0	1.6	1962	4th-highest
Akaroa	19.5	1.5	1978	4th-highest
Hicks Bay	20.5	1.5	1969	4th-highest
Whanganui	20.3	1.5	1937	4th-highest
Blenheim	20.2	1.3	1932	4th-highest
Kerikeri	22.2	1.2	1945	4th-highest
Martinborough	19.8	1.2	1986	4th-highest

Low records or near-records

None observed

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				
Castlepoint	14.3	2.5	1972	Highest
Greymouth	11.3	2.3	1947	Highest
Haast	10.2	2.1	1949	Highest
Ōkārito	10.2	2.1	1982	Highest
Puysegur Point	11.4	2.1	1978	Highest
Arapito	10.6	2.0	1978	Highest
Secretary Island	11.6	2.0	1985	Highest
Oban (Stewart Island)	8.8	2.0	1975	Highest
Franz Josef	8.9	1.9	1953	Highest
Kaitaia	14.7	1.9	1948	Highest
Leigh	16.1	1.6	1966	Highest
Nugget Point	9.1	1.6	1970	Highest
Gore	7.1	1.3	1907	Highest
Tiwai Point	9.1	1.3	1970	Highest
Cape Campbell	12.7	1.1	1953	Highest
Westport	12.0	2.5	1937	2nd-highest
Dunedin (Musselburgh)	9.7	1.6	1947	2nd-highest
Mokohinau	17.2	1.5	1994	2nd-highest
Mt Cook Village	5.5	1.4	1929	2nd-highest
Campbell Island	6.4	1.1	1991	2nd-highest
Te Anau	6.8	2.0	1963	3rd-highest
Hokitika Airport	10.1	1.8	1866	3rd-highest
Te Puke	11.3	1.8	1973	3rd-highest
Kerikeri	13.2	1.6	1945	3rd-highest
Whangaparāoa	15.5	1.5	1982	3rd-highest
Whangārei Airport	14.2	1.5	1967	3rd-highest
Le Bons Bay	10.2	1.1	1984	3rd-highest
Kaikōura	10.9	1.0	1963	3rd-highest
Porirua	11.0	0.7	1968	3rd-highest
Christchurch (Botanic Gardens)	9.0	1.8	1863	4th-highest
Invercargill	7.4	1.6	1905	4th-highest
Tauranga	12.9	1.5	1913	4th-highest
Rangiora	7.5	1.4	1965	4th-highest
Auckland (Whenuapai)	12.4	1.3	1945	4th-highest
Wellington (Kelburn)	12.0	1.2	1928	4th-highest
Windsor	6.1	1.2	2000	4th-highest
Wellington (Airport)	12.6	1.1	1962	4th-highest

Low records or near-records

None observed

Rainfall: Downpours and sunny spells

Much of the South Island experience a dry autumn, while the North Island experienced several significant downpours occurred along with extended dry periods.

Middlemarch had their driest autumn on record, with records extending back to 1896. Additionally, Mt Cook Airport also had their driest autumn on record, with records extending back to 1928. Meanwhile, it was the second-wettest autumn in record in Wairoa, driven by two extreme rainfall events in March and April.

Invercargill had a dry spell from 14-31 March, contributing to the proliferation of meteorological drought in Southland. In contrast within this same time period exceptionally heavy rainfall occurring in Auckland, Northland, the Bay of Plenty and Gisborne, including a thunderstorm on March 21 that produced rainfall rates leading to the 2nd-wettest hour on record in the Auckland region where North Shore recorded 76.8 mm of rain in an hour between 8 a.m. and 9 a.m. Moreover, 103 mm of rain was recorded from 4 a.m. – 5 a.m. at Maungatapere near Whangārei, making it the new national hourly rainfall record for a low elevation station (less than 500 metres above sea level).

See the *highlights and extreme events* section for more details.

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				
Wairoa	662	182	1964	2nd-highest
Low records or near-records				
Middlemarch	30	27	1896	Lowest
Mt Cook Airport	314	29	1928	Lowest
Windsor	63	44	2000	Lowest
Clyde	39	37	1978	2nd-lowest
Dunedin (Musselburgh)	66	37	1918	2nd-lowest
Ranfurlly	42	40	1897	2nd-lowest
Akaroa	107	47	1977	2nd-lowest
Winchmore	89	50	1947	2nd-lowest
Balclutha	93	56	1964	2nd-lowest
Cromwell	37	36	1949	3rd-lowest
Hanmer Forest	114	47	1905	3rd-lowest
Matamata	119	47	1951	3rd-lowest
Oban (Stewart Island)	268	63	1975	3rd-lowest
Lincoln	62	42	1881	4th-lowest
Martinborough	78	43	1924	4th-lowest
Oamaru	53	44	1941	4th-lowest
Orari Estate	71	45	1897	4th-lowest

Autumn in the six main centres

Near-record high mean autumn temperatures were observed in all main centres except Hamilton and Christchurch, where the mean temperatures were above average. Dunedin's autumn rainfall was the 2nd-lowest on record, while below normal rainfall was observed in Auckland, Wellington and Christchurch. Near normal rainfall was observed in Hamilton and above normal rainfall was observed in Tauranga.

Of the six main centres in autumn 2022, Auckland was the warmest, Christchurch was the coolest, Hamilton was the sunniest, Wellington was the least sunny, Tauranga was the wettest, and Dunedin was the driest.

Autumn 2022 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland ^a	17.6	+1.4	Well above average (3 rd -highest on record)
Tauranga ^b	17.2	+1.5	Well above average (2 nd -highest on record)
Hamilton ^c	15.4	+1.2	Above average
Wellington ^d	14.9	+1.2	Above average (4 th -highest on record)
Christchurch ^e	12.8	+0.8	Above average
Dunedin ^f	13.3	+1.7	Well above average (2 nd -highest on record)
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland ^a	199	72	Below normal
Tauranga ^b	411	125	Above normal
Hamilton ^c	271	97	Near normal
Wellington ^d	210	75	Below normal
Christchurch ^e	109	70	Below normal
Dunedin ^f	66	37	Well below normal (2 nd -lowest on record)
Sunshine			
Location ²	Sunshine (hours)		
Auckland ^a	609		
Tauranga ^b	537		
Hamilton ^g	623		
Wellington ^d	510		
Christchurch ^e	539		
Dunedin ^f	550		

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

² Tauranga, Wellington and Christchurch record sunshine use Campbell-Stokes manual sunshine recorders, whereas Auckland, Hamilton and Dunedin record sunshine with high-precision electronic sensors.

Highlights and extreme events

This section contains information pertaining to some of the more significant highlights and extreme events that occurred during autumn 2022. Note that a more detailed list of significant weather events for autumn 2022 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 during autumn 2022 was 30.6°C, observed at Whatawhata on 9 and 15 March.

The lowest temperature during autumn 2022 was -6.9°C, observed at Middlemarch on 28 May.

Unseasonable warmth was particularly pronounced in Canterbury and Otago on 6 March. Akaroa, Timaru and Oamaru recorded daytime maximums above 30°C. This was the hottest March day since 2016 in Oamaru and their 3rd-highest March temperature on record.

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				
Haast	25.9	Mar 22nd	1949	Highest
Ōkārito	24.8	Mar 20th	1982	Equal highest
Windsor	30.0	Mar 6th	2000	2nd-highest
Auckland (Airport)	28.5	Mar 13th	1959	2nd-highest
Manapouri (Airport)	27.6	Mar 11th	1963	2nd-highest
South West Cape	25.9	Mar 11th	1991	2nd-highest
Secretary Island	25.7	Mar 20th	1985	2nd-highest
Tiri Tiri	25.5	Mar 13th	1982	2nd-highest
Whatawhata	30.6	Mar 9th	1952	Equal 2nd-highest
Oamaru	30.2	Mar 6th	1967	3rd-highest
Levin	29.1	Mar 22nd	1895	3rd-highest
Reefton	28.4	Mar 10th	1960	3rd-highest
Stewart Island	25.7	Mar 8th	1975	3rd-highest
Puysegur Point	24.0	Mar 11th	1978	3rd-highest
Arthurs Pass	24.5	Mar 9th	1978	Equal 3rd-highest
Mt Ruapehu (Chateau)	23.0	Mar 9th	2000	Equal 3rd-highest
Leigh	28.8	Mar 12th	1966	4th-highest
Lumsden	27.4	Mar 23rd	1982	4th-highest
Porirua	27.0	Mar 22nd	1968	4th-highest
Stratford	25.6	Mar 8th	1960	4th-highest
Thames	27.5	Mar 29th	1946	Equal 4th-highest
Cape Reinga	26.2	Mar 12th	1951	Equal 4th-highest
Low records or near-records				
None observed				

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				
Paraparaumu	-2.5	Sep-1st	1953	3rd-lowest
Whanganui	-0.2	Sep-1st	1937	4th-lowest
Puysegur Point	1.7	Oct-22nd	1978	4th-lowest
High records or near-records				
South West Cape	15.6	Mar-31st	1991	Equal 2nd-highest
Westport	19.6	Apr-21st	1966	Equal 3rd-highest
Arthurs Pass	13.9	Apr-21st	1978	3rd-highest
Castlepoint	19.4	Apr-06th	1972	Equal 4th-highest

Rain and slips

The highest 1-day rainfall during autumn 2022 was 226 mm, recorded at Milford Sound on 20 April.

On 21 March, a sub-tropical low pressure system generated a band of severe thunderstorms which produced flooding in Northland and Auckland. 103 mm of rain was recorded from 4 a.m. – 5 a.m. at Maungatapere near Whangārei, making it the new national hourly rainfall record for a low elevation station (less than 500 metres above sea level). Whangārei also observed its wettest hour on record (64.4 mm) since at least January 1979.

Elsewhere, Albany on Auckland’s North Shore recorded 76.8 mm of rain in an hour between 8 a.m. and 9 a.m., qualifying as the location’s wettest hour on record (since December 2009) as well as the 2nd-wettest hour on record in the Auckland region on record (from top-of-hour to top-of-hour). The Auckland region’s wettest hour on record stands as 100.6 mm at Whenuapai in February 1996. Auckland (Māngere) also observed its wettest hour on record (56.6 mm) since at least November 1965.

This same system then moved on to produce downpours across parts of the Bay of Plenty, Gisborne and Hawke’s Bay area. Tolaga Bay recorded 35 mm of rain in an hour on 22 March and Rotorua recorded 34 mm in an hour on 23 March. Gisborne received 21 mm in an hour on 24 March. Hikuwai River at No 4 Bridge (weather station operated by Gisborne District Council) observed 275.5 mm on 23 March. Three day rainfall (21-23 March) exceeded 400 mm at both Hikuwai River at No 4 Bridge and Willowflat). A state of emergency was declared in Tairāwhiti on 23 March as river levels rose rapidly. Tairāwhiti Civil Defence have evacuated residents from several areas, including Mangatuna, Tokomaru Bay and Tolaga Bay. Huge slips and flooding caused roads and bridges to be completely destroyed, cutting off some towns. On 25 March, the Ministry for Primary Industries classified a medium-scale adverse event for the impact of the flooding in Tairāwhiti and Hawke’s Bay, unlocking \$150,000 of funds for affected farmers and growers.

According to NIWA’s New Zealand Drought Monitor, meteorological drought conditions were present in southern parts of Southland and Stewart Island throughout the second half of March. On 31 March, the Ministry for Primary Industries classified a medium-scale adverse event for the drought conditions in Southland, Clutha and Queenstown Lakes District, unlocking \$100,000 of funds for affected farmers and growers until October 2022.

On 12 April, MetService issued a Red Warning for heavy rain and the potential for significant flooding in Gisborne and northern Hawke’s Bay during the following day due to Cyclone Fili. On 13 April, Fili, a deep low pressure system, passed just offshore of East Cape during the mid-afternoon hours and for the second time this autumn, a heavy rainfall event battered the region. Several hundred power cuts were reported, along with surface flooding on State Highway (SH) 35, causing closures between Hicks Bay and Te Araroa and between Tokomaru Bay and Te Puia. By late afternoon, Gisborne’s wastewater system was struggling to cope with the amount of water draining from residential properties, prompting the council to open an emergency sewer valve at Gladstone Bridge. In coastal Hawke’s Bay, south of Hastings, localised flooding damaged bridges and fences that were repaired after the March deluge. According to a weather station operated by Gisborne District Council at the East Cape Lighthouse, storm total rainfall from 13-14 April reached 200 mm.

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
Waihau	190	Mar-22nd	1985	Highest
Pukeokahu	98	Mar-23rd	1991	Highest
Māhia	79	Mar-23rd	1990	Highest
Ohakune	78	May-17th	1961	Highest
Brentwood	165	Mar-23rd	1966	2nd-highest
Te Kaihi	132	Mar-24th	1995	2nd-highest
Makaretu North	125	Mar-23rd	1960	2nd-highest
Ongaonga	103	Mar-23rd	1969	2nd-highest
Takapau Plains	101	Mar-23rd	1962	2nd-highest
Taihape	54	Mar-23rd	1970	2nd-highest
Rose Hill	108	Mar-23rd	1954	3rd-highest
Kokiri	96	Apr-20th	1980	3rd-highest
Eskdale Hedgeley	152	Mar-23rd	1894	4th-highest
Mahana Lodge	116	Mar-24th	1984	4th-highest

Wind

The highest wind gust in autumn 2022 was 193 km/h, observed at Cape Foulwind on 20 May.

On 20 May, strong and damaging winds struck many parts of the North Island. In Cambridge, a woman died after being trapped under a tree that had toppled in the wind. Farther north, several lanes of the Auckland Harbour Bridge were closed as a result of the strong winds.

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
Levin	141	May-20th	1971	Highest
Puysegur Point	161	May-1st	1986	2nd-highest
Hāwera	102	May-20th	1986	3rd-highest

Tūrangi	100	May-21st	1973	3rd-highest
Clyde	87	May-21st	1983	4th-highest
Mahia	102	Apr-13th	1991	4th-highest
Mokohinau	113	Apr-18th	1994	Equal 4th-highest
Mt Ruapehu (Chateau)	107	Mar-24th	2000	Equal 4th-highest

Thunderstorms and tornadoes

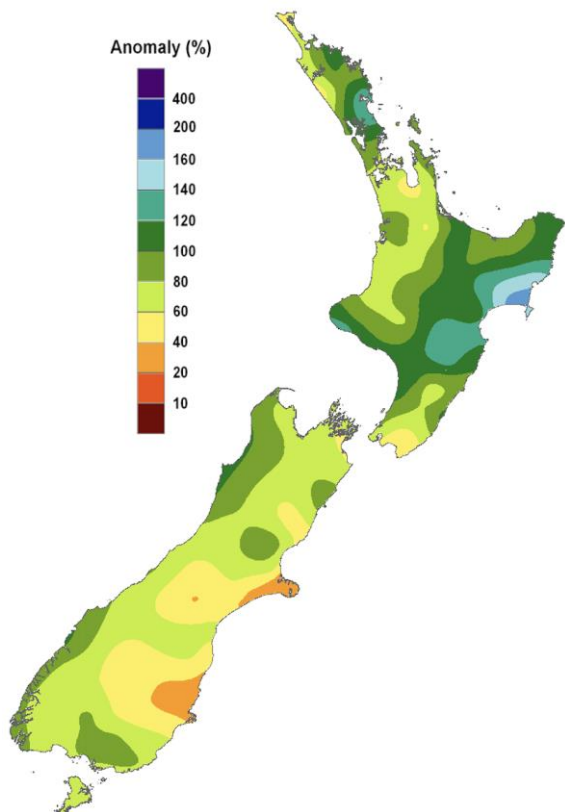
On 20 May, severe thunderstorms occurred over much of the country, but especially southern parts of the North Island. At around 6:15-6:30 a.m., a likely tornado hit Levin, damaging between 30-50 homes, and bringing down numerous powerlines and mature trees. In Ōhau (just south of Levin), a severe hailstorm caused considerable damage to property and crops. One farmer described the damage as catastrophic and the worst hail damage in 44 years of farming, with nothing left of their cabbage, silverbeet and lettuce crop. Around 12,000 lightning strikes were recorded about New Zealand in the 6 hours to 11:30 a.m.

For further information please contact:

Tristan Meyers

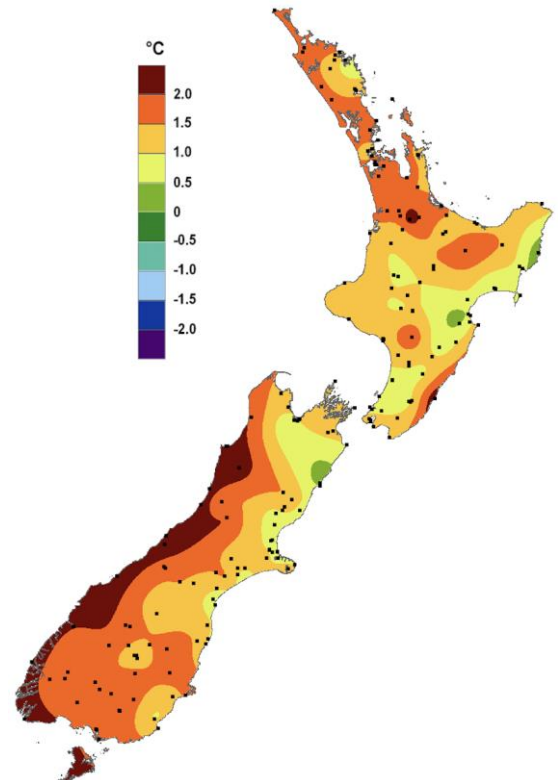
Meteorologist and Forecaster

Tel. 022 677 6902



Autumn rainfall

Expressed as a percentage of the 1981-2010 normal.



Autumn temperature

Expressed as a departure from the 1981-2010 average in degrees Celsius.

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

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