

A summer of floods and droughts, and very warm

Rainfall	It was exceptionally wet for the North Island. Auckland, Northland, Bay of Plenty and Hawke's Bay each had their wettest summer on record. Above normal (120-149% of normal) or well above normal (>149% of normal) rainfall was observed across most of the North Island, except for near normal rainfall in parts of the western North Island. In the South Island, rainfall was above normal (120-149% of normal) or well above normal (>149% of normal) for the northeast, but below normal (50-79% of normal) or well below normal (<50% of normal) across parts of the west and south, and near normal (80-119% of normal) elsewhere.
Temperature	It was the third-warmest summer on record. Summer temperatures were above average (0.51-1.20°C above average) or well above average (>1.20°C above average) across the west and south of the South Island, as well as parts of the western North Island. Near average temperatures ($\pm 0.50^\circ\text{C}$ of average) were observed elsewhere. No areas observed below average temperatures.
Soil moisture	At the end of summer, soil moisture levels were well above normal across the North Island, except near normal about patches of the west. In the South Island, well-above normal soil moisture levels were seen for mid and upper Canterbury, Kaikoura and eastern Marlborough, with well below normal soil moisture levels were seen across Southland, southern Otago, and the upper West Coast. Near normal soil moisture levels were observed elsewhere.

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Overview

Summer 2022-23 was characterised by contrasting weather extremes across Aotearoa New Zealand. It was exceptionally wet for the North Island. Auckland, Northland, Bay of Plenty and Hawke's Bay each had their wettest summer on record. The Auckland region received over 5.5 times its normal summer rainfall and 63% of the entire annual normal based on an analysis from NIWA's Virtual Climate Station Network (VCSN). Auckland, Northland, the Bay of Plenty, Gisborne, and Hawke's Bay in particular experienced a predominantly wet and cloudy season, marred by several bouts of extreme rainfall and devastating flooding, including an event where Auckland recorded over 280% of its January normal rainfall in under six hours. Meanwhile, the South Island endured extended periods of hot, dry, sunny weather. This led to some areas developing meteorological drought according to NIWA's New Zealand Drought Index (NZDI), highlighting how this summer stood out for its remarkable climatic contrasts.

During summer 2022-23, two ex-tropical cyclones impacted New Zealand. The first one, named Hale, occurred on 10-11 January and made landfall in the North Island. The second, Gabrielle, occurred

over 12-15 February and resulted in historic flooding, widespread destruction to agricultural, horticultural and viticultural lands, dozens of impassable roads, severe coastal erosion, the country's third-ever national state of emergency declaration, and loss of life. See the [Highlights and extreme events](#) section for more details.

Typical of La Niña summers, higher-than-normal air pressure was observed to the east and south of New Zealand, with lower-than-normal air pressure to the north and west (Figure 1). This resulted in more easterly and northeasterly winds than usual, drawing in warm and humid air from the tropics and sub-tropics. Generally speaking, this partly explains why persistently wet and cloudy weather was experienced in northern and eastern parts of both Islands, with sunnier and drier conditions in the west and south of both islands.

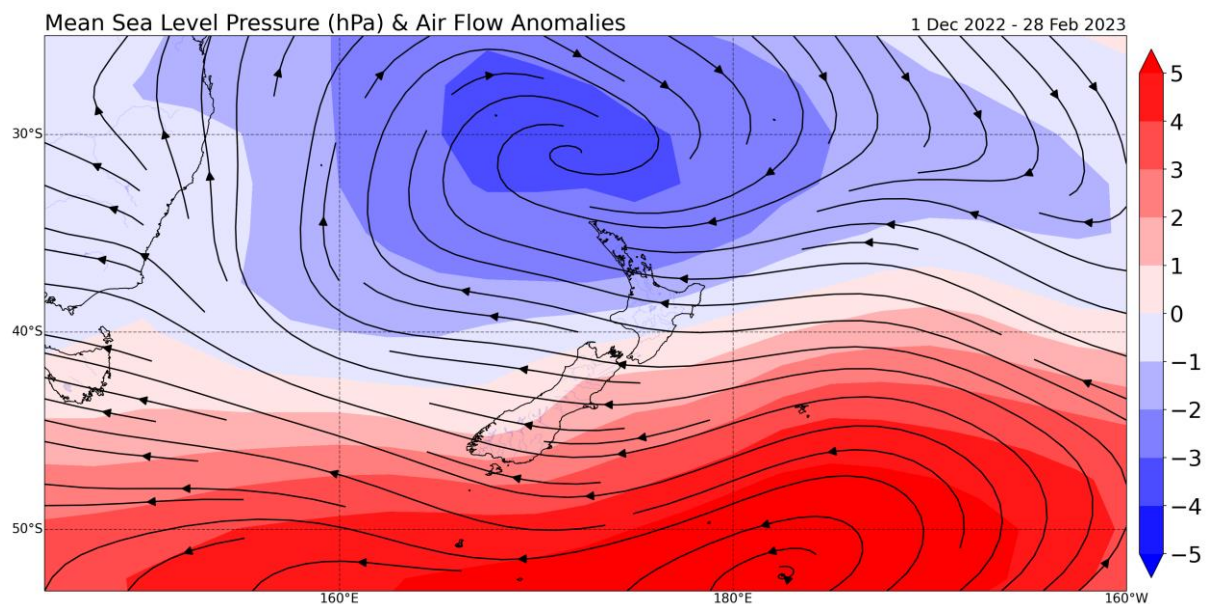


Figure 1: Mean sea level pressure (MSLP) and air flow anomalies during summer 2022-23. Blue colours indicate lower than normal MSLP, and red colours indicate higher than normal MSLP. Data from NCEP Reanalysis.

Exacerbating the warmth, humidity, and moisture availability to passing low pressure systems was a protracted marine heatwave (MHW) that peaked during January and rivalled the exceptional MHWs of 2017-2018 and 2021-2022. February sea surface temperatures (SSTs) were the warmest on record in the west and east of the South Island, and second-warmest on record in the north of the South Island.

The Southern Annular Mode¹ (SAM) was positive most of summer, but did dip negative during February, coinciding with the arrival of ex-Tropical Cyclone Gabrielle. A positive SAM during summer tends to be associated with belts of high pressure near the South Island, which matches what was observed during summer 2022-23.

Frequent heavy rainfall events saturated soils across the North Island and caused several bouts of flooding, which was particularly severe about Northland, Auckland, Coromandel, the Bay of Plenty, Gisborne, Hawke's Bay, and Wairarapa. Above normal (120-149% of normal) or well above normal (>149% of normal) rainfall was observed across the North Island, except for near normal rainfall about patches of the west. In the South Island, rainfall was above normal (120-149% of normal) or well above normal (>149% of normal) for the northeast, below normal (50-79% of normal) or well

¹ A proxy for measuring the strength and position of the belt of westerly winds that encircle the Southern Ocean, and can bring unsettled weather to New Zealand during its negative phase.

below normal (<50% of normal) across parts of the west and south, and near normal (80-119% of normal) elsewhere.

Summer temperatures were above average (0.51-1.20°C above average) or well above average (>1.20°C above average) across the west and south of the South Island, as well as parts of the western North Island. Near average temperatures ($\pm 0.50^\circ\text{C}$ of average) temperatures were observed elsewhere. No areas observed below average temperatures.

Both December and January ranked as the tenth-warmest on record, while February ranked as the fifth-warmest. Summer 2022-23 as a whole was the third-warmest summer on record. The nationwide average temperature in summer 2022-23 was 17.9°C . This was $+1.1^\circ\text{C}$ above the 1991-2020 summer average from NIWA's seven station temperature series which begins in 1909.

Further highlights for summer 2022-23:

- The highest temperature was 35.6°C , observed at Middlemarch on 4 February.
- The lowest temperature was -0.4°C , observed at Manapouri on 24 February.
- The highest 1-day rainfall was 316 mm, recorded at Tūtira (Hawke's Bay) on 13 February.
- The highest wind gust was 150 km/h, observed at Mokohinau on 12 February.
- Of the available, regularly reporting sunshine observation sites, the sunniest four locations so far in 2023 are Central Otago (563 hours), West Coast (549 hours), Mackenzie Basin (545 hours), and Queenstown Lakes District (527 hours).
- Of the six main centres in summer 2022-23, Auckland was the warmest, wettest, and least sunny; Dunedin was the coolest, driest, and sunniest.

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Temperature: New Zealand's third-warmest summer on record

The nationwide average temperature for summer 2022-23 was 17.9°C (1.1°C above the 1991-2020 average from NIWA's seven station temperature series which begins in 1909), making summer 2022-23 the third-warmest summer on record.

Anomalous easterly and northeasterly winds caused by La Niña's circulation patterns resulted in prolonged foehn winds across the western and southern regions of the South Island. This is unusual for New Zealand, given the country is situated in the latitudes of prevailing westerlies. These hot and arid winds caused remarkably high mean temperatures in the West Coast, Otago, and Southland regions. MHW conditions also contributed to warm overnight temperatures; 65 locations experienced record or near-record warm minimum temperatures. Furthermore, the West Coast experienced an abundance of sunshine, with Hokitika recording the highest number of sunshine hours this summer (879 hours) among all New Zealand locations with sunshine sensors. In fact, the sunshine hours in Hokitika were twice as much as those recorded in Dannevirke and Dargaville.

In contrast, frequently cloudy and humid conditions tempered daytime temperatures but led to warm nights across most of the North Island. Only 14 observation stations across the North Island recorded temperatures above 30°C during summer 2022-23, compared with 59 observation stations last summer.

Record² or near-record mean air temperatures for summer were recorded at:

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Secretary Island	17.5	3.1	1985	Highest
Greymouth	18.6	3.0	1947	Highest
Franz Josef	17.5	2.6	1953	Highest
Haast	16.9	2.5	1949	Highest
Manapouri (West Arm Jetty)	16.2	2.2	1971	Highest
South West Cape	15.0	2.1	1991	Highest
Ōkārito	17.5	2.0	1982	Highest
Oban (Stewart Island)	15.2	1.9	1975	Highest
Waipounamu	15.9	1.4	1980	Highest
Campbell Island	10.6	1.3	1991	Highest
Westport	19.3	3.2	1937	2nd-highest
Arapito	18.6	2.6	1978	2nd-highest
Hokitika	17.9	2.5	1866	2nd-highest
Te Anau	16.3	2.2	1963	2nd-highest
Milford Sound	16.8	2.1	1934	2nd-highest
Reefton	18.6	1.7	1960	2nd-highest
Balclutha	15.8	1.6	1964	2nd-highest
Dunedin (Musselburgh)	16.3	1.6	1947	2nd-highest
Levin	18.8	1.5	1895	2nd-highest
Lumsden	15.6	1.4	1982	2nd-highest
Chatham Island	16.7	1.3	1878	2nd-highest
Windsor	15.9	1.1	2000	2nd-highest
Westport	18.5	2.4	1937	3rd-highest
Oamaru	15.9	1.9	1967	3rd-highest
Five Rivers	15.5	1.6	1982	3rd-highest
Nugget Point	15.1	1.4	1970	3rd-highest
Christchurch (Botanic Gardens)	18.1	1.3	1863	3rd-highest
Tiwai Point	15.5	1.3	1970	3rd-highest
Tautuku	15.0	1.2	1976	3rd-highest
Ranfurly	15.6	1.1	1897	3rd-highest
Invercargill	15.4	1.6	1905	4th-highest
Wānaka	18.3	1.6	1955	4th-highest
Roxburgh	17.2	1.5	1950	4th-highest
Motu	16.8	1.4	1990	4th-highest
Upper Hutt (Trentham)	17.7	1.2	1939	4th-highest
Tākaka	18.0	1.0	1978	4th-highest
Low records or near-records				
None observed				

² 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 summer were recorded at:

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Greymouth	23.0	4.1	1947	Highest
Franz Josef	23.3	3.8	1953	Highest
Secretary Island	21.4	3.8	1985	Highest
Haast	21.2	3.1	1949	Highest
Arapito	23.7	3.0	1978	Highest
Manapouri (West Arm Jetty)	21.6	2.8	1971	Highest
Ōkārito	22.3	2.7	1982	Highest
South West Cape	18.3	2.5	1991	Highest
Waipounamu	22.1	1.9	1980	Highest
Campbell Island	13.3	1.5	1991	Highest
Westport	22.6	2.8	1937	2nd-highest
Milford Sound	21.6	2.5	1934	2nd-highest
Reefton	24.9	2.0	1960	2nd-highest
Middlemarch	23.3	1.4	2000	2nd-highest
Windsor	21.5	1.2	2000	2nd-highest
Hokitika	22.5	3.3	1866	3rd-highest
Westport	22.5	2.6	1937	3rd-highest
Cromwell	26.5	2.2	1949	3rd-highest
Balclutha	21.5	2.1	1964	3rd-highest
Oamaru	20.4	2.1	1967	3rd-highest
Oban (Stewart Island)	19.1	1.8	1975	3rd-highest
Lumsden	21.7	1.6	1982	3rd-highest
Clyde	25.8	1.5	1978	3rd-highest
Ranfurly	22.9	1.4	1897	3rd-highest
Invercargill	20.7	2.2	1905	4th-highest
Manapouri (Airport)	22.3	2.1	1963	4th-highest
Levin	23.4	1.8	1895	4th-highest
Dunedin (Airport)	22.0	1.4	1962	4th-highest
Tiwai Point	19.1	1.4	1970	4th-highest
Low records or near-records				
Mokohinau	21.3	-0.7	1994	3rd-lowest

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

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Secretary Island	13.7	2.4	1985	Highest
Oban (Stewart Island)	11.3	2.0	1975	Highest
Campbell Island	7.9	1.0	1991	Highest
Westport	16.0	3.6	1937	2nd-highest

Te Anau	10.9	2.9	1963	2nd-highest
Hamilton (Ruakura)	14.9	2.3	1906	2nd-highest
Arapito	13.5	2.1	1978	2nd-highest
Greymouth	14.2	2.0	1947	2nd-highest
Milford Sound	12.1	1.8	1934	2nd-highest
South West Cape	11.7	1.8	1991	2nd-highest
Waipawa	13.0	1.8	1945	2nd-highest
Dunedin (Musselburgh)	12.9	1.7	1947	2nd-highest
Nugget Point	11.6	1.7	1970	2nd-highest
Chatham Island	13.5	1.6	1878	2nd-highest
Palmerston North	14.5	1.6	1928	2nd-highest
Tautuku	10.7	1.6	1976	2nd-highest
Rangiora	12.2	1.5	1965	2nd-highest
Five Rivers	9.8	1.4	1982	2nd-highest
Gore	10.5	1.3	1907	2nd-highest
Lower Retaruke	12.9	1.3	1966	2nd-highest
Ōkārito	12.7	1.3	1982	2nd-highest
Tiwai Point	11.9	1.3	1970	2nd-highest
Roxburgh	11.4	1.2	1950	2nd-highest
Akaroa	13.2	1.1	1978	2nd-highest
Motueka	12.8	1.1	1956	2nd-highest
Ngawi	15.5	1.1	1972	2nd-highest
Stratford	12.3	1.1	1960	2nd-highest
Waipounamu	9.6	0.9	1980	2nd-highest
Taumarunui	13.3	2.0	1947	3rd-highest
Haast	12.6	1.9	1949	3rd-highest
Motu	12.3	1.9	1990	3rd-highest
Taupō	13.3	1.9	1949	3rd-highest
Christchurch (Botanic Gardens)	13.4	1.8	1863	3rd-highest
Te Puke	15.3	1.8	1973	3rd-highest
Dannevirke	13.3	1.7	1951	3rd-highest
Upper Hutt (Trentham)	13.3	1.7	1939	3rd-highest
Waikeria	14.1	1.6	1957	3rd-highest
Lincoln	12.8	1.5	1881	3rd-highest
New Plymouth	14.8	1.5	1944	3rd-highest
Whakatāne	15.8	1.5	1974	3rd-highest
Oamaru	11.7	1.4	1967	3rd-highest
Auckland (Western Springs)	16.5	1.3	1948	3rd-highest
Cheviot	11.4	1.3	1982	3rd-highest
Lumsden	9.5	1.2	1982	3rd-highest
Masterton (Te Ore Ore)	12.6	1.0	1906	3rd-highest
Matamata, Hinuera	14.1	2.2	1999	4th-highest
Napier	15.9	1.9	1870	4th-highest
Hokitika	13.3	1.7	1866	4th-highest
Manapouri (West Arm Jetty)	10.8	1.7	1971	4th-highest
Kaitia	16.3	1.6	1948	4th-highest
Oamaru	11.4	1.6	1967	4th-highest
Tākaka	12.9	1.6	1978	4th-highest

Waimate	12.1	1.6	1908	4th-highest
Waiouru	9.7	1.6	1962	4th-highest
Whitianga	15.7	1.6	1962	4th-highest
Port Taharoa	16.7	1.5	1973	4th-highest
Reefton	12.3	1.4	1960	4th-highest
Tauranga	16.5	1.4	1913	4th-highest
Le Bons Bay	12.6	1.3	1984	4th-highest
Nelson	14.8	1.3	1862	4th-highest
Auckland (Whenuapai)	15.5	1.2	1945	4th-highest
Levin	14.2	1.2	1895	4th-highest
Purerua	16.2	1.0	1983	4th-highest
Windsor	10.3	0.9	2000	4th-highest
Low records or near-records				
None observed				

Rainfall: Floods and droughts

It was exceptionally wet for the North Island. Auckland, Northland, Bay of Plenty and Hawke's Bay each had their wettest summer on record. The Auckland region received over 5.5 times its normal summer rainfall and 63% of the entire annual normal based on an analysis from NIWA's Virtual Climate Station Network (VCSN). Whangārei recorded over 77% of its annual normal rainfall during summer. For Kaikohe and Tauranga, rain was recorded on 70% of the days during the season. Thirty-two stations observed record or near record wet summers. It was the wettest summer on record for several major centres, including Napier, Auckland, Whangārei, Gisborne, and Tauranga.

Meanwhile, it was the second-driest summer on record for Southland, the fifth-driest for Otago, and sixth-driest for the West Coast, according to an analysis using NIWA's VCSN. Meteorological drought developed in Otago during February according to NIWA's New Zealand Drought Index, while widespread dryness was observed for much of the west and south of the South Island. Many areas failed to record even half of their normal summer rainfall, including Manapouri, Reefton, Dunedin, Mt Cook Village, and Balclutha. Many locations in the South Island experienced extended dry spells, with Ohoka and Lake Tekapo both recording over 70 days with no rain at all during summer.

Sixteen locations observed a record or near-record dry summer, while 31 locations observed a record or near-record wet summer. The wettest 24-hour rainfall total for the South Island occurred on 5 February, when Milford Sound recorded 200.5 mm of rain, while the wettest 24-hour observed total for the North Island occurred on 12 February, when Tūtira recorded 315.6 mm of rainfall.

Record or near-record summer rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
High records or near-records				
Napier	743	423	1870	Highest
Auckland (Māngere)	765	417	1959	Highest
Whangārei	1004	398	1937	Highest
Auckland (Albany)	856	389	1966	Highest
Auckland (Western Springs)	864	389	1948	Highest

Warkworth	994	379	1966	Highest
Auckland Airport	732	361	1959	Highest
Whakatu	472	328	1965	Highest
Gisborne	640	324	1937	Highest
Whangaparāoa	612	310	1946	Highest
Castlepoint	622	309	1902	Highest
Tauranga	754	287	1898	Highest
Waipawa	483	267	1945	Highest
Te Puke	906	257	1973	Highest
Purerua	476	211	1983	Highest
Leigh	750	339	1966	2nd-highest
Masterton	462	286	1926	2nd-highest
Pukekohe	583	255	1944	2nd-highest
Dargaville	455	228	1943	2nd-highest
Whakatāne	561	223	1952	2nd-highest
Kerikeri	767	204	1935	2nd-highest
Port Taharoa	487	199	1973	2nd-highest
Tūrangi	635	197	1968	2nd-highest
Kaikōura	430	316	1898	3rd-highest
Rotorua	752	242	1963	3rd-highest
Te Kuiti	622	210	1950	3rd-highest
Dannevirke	452	197	1951	3rd-highest
Cheviot	265	196	1982	3rd-highest
Waiouru	411	168	1950	3rd-highest
Russell	624	217	1919	4th-highest
Wairoa	528	210	1964	4th-highest
Taupō	467	207	1949	4th-highest
Hamilton (Ruakura)	474	198	1905	4th-highest
Low records or near-records				
Mt Cook Airport	232	21	1928	Lowest
Arapito	182	35	1978	Lowest
Balclutha	73	41	1964	Lowest
Dunedin (Musselburgh)	88	41	1918	Lowest
Windsor	63	41	2000	Lowest
Nugget Point	102	49	1930	Lowest
Reefton	191	47	1960	2nd-lowest
Ōkārito	569	68	1981	2nd-lowest
Westport	229	47	1893	3rd-lowest
Invercargill	155	61	1900	3rd-lowest
Tautuku	198	66	1976	3rd-lowest
Campbell Island	258	75	1992	3rd-lowest
Manapouri (West Arm Jetty)	448	48	1971	4th-lowest
Greymouth	349	58	1947	4th-lowest
Manapouri	164	60	1961	4th-lowest
South West Cape	251	81	1991	4th-lowest

Summer in the six main centres

Temperatures were above average for Hamilton, Wellington, Christchurch, and well above average in Dunedin. Meanwhile, temperatures were near average in Auckland and Tauranga. Well above normal rainfall was recorded in Auckland, Tauranga, Hamilton, Wellington, and Christchurch, and well below normal rainfall was recorded in Dunedin. It was the wettest summer on record for Auckland and Tauranga, and the driest on record for Dunedin. Of the six main centres in summer 2022-23, Auckland was the warmest, wettest, and least sunny; Dunedin was the coolest, driest, and sunniest.

Summer 2022-23 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland ^a	20.0	+0.3	Near average
Tauranga ^b	19.8	+0.4	Near average
Hamilton ^c	19.1	+0.9	Above average
Wellington ^d	17.4	+0.8	Above average
Christchurch ^e	17.4	+0.8	Above average
Dunedin ^f	16.3	+1.6	Well above average (2nd-warmest on record)
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland ^a	765	417	Well above normal (wettest on record)
Tauranga ^b	754	287	Well above normal (wettest on record)
Hamilton ^c	466	188	Well above normal
Wellington ^d	413	182	Well above normal
Christchurch ^e	182	140	Well above normal
Dunedin ^f	88	41	Well below normal (driest on record)
Sunshine			
Location	Sunshine (hours)		
Auckland ^a	550		
Tauranga ^b	557		
Hamilton ^g	558		
Wellington ^d	614		
Christchurch ^e	683		
Dunedin ^f	701		

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

Highlights and extreme events

This section contains information pertaining to some of the more significant highlights and extreme events that occurred during summer 2022-23. Note that a more detailed list of significant weather events for summer 2022-23 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 35.6°C, observed at Middlemarch on 4 February.

The lowest temperature was -0.4°C, observed at Manapouri on 24 February.

Western, inland and southern parts of the South Island were frequented by regular spells of relatively high temperatures during summer. Perhaps most notable was Greymouth, where the maximum temperature reached 30.9°C on 8 January. This was the first time Greymouth had registered a temperature of 30°C or more, with records beginning in 1947.

From 1-7 February, very hot temperatures occurred across the lower and eastern South Island. The air pressure setup involved strong low pressure over eastern Australia and a strong high pressure system to the east of New Zealand, which directed a hot, humid flow from Queensland. On 4 February, Middlemarch observed New Zealand's hottest temperature of the summer, reaching 35.6°C.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Greymouth	30.9	Jan-8th	1947	Highest
Milford Sound	29.4	Feb-4th	1934	Highest
Secretary Island	28.3	Feb-15th	1985	Highest
Campbell Island	21.2	Feb-5th	1991	Highest
Windsor	33.6	Feb-3rd	2000	2nd-highest
Lumsden	31.2	Feb-4th	1982	2nd-highest
Manapouri (West Arm Jetty)	30.1	Jan-9th	1971	2nd-highest
Arapito	29.4	Jan-28th	1978	2nd-highest
Westport	29.1	Jan-28th	1937	2nd-highest
Ōkārito	26.9	Jan-30th	1982	2nd-highest
Waipounamu	31.7	Feb-4th	1980	Equal 2nd-highest
Middlemarch	35.6	Feb-4th	2000	3rd-highest
Gore	34.1	Feb-4th	1907	3rd-highest
Haast	28.3	Feb-15th	1949	3rd-highest
Akaroa	35.1	Feb-4th	1978	Equal 3rd-highest
Manapouri Airport	30.8	Jan-29th	1963	4th-highest
Westport	28.2	Jan-28th	1937	4th-highest
South West Cape	26.5	Feb-4th	1991	4th-highest
Low records or near-records				
Pukaki Airport	9.8	Feb-22nd	1972	Equal 4th-lowest

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Westport	22.4	Feb-3rd	1966	Highest
Appleby	20.9	Feb-5th	1941	Highest
Secretary Island	20.0	Feb-5th	1988	Highest
Motu	18.9	Dec-10th	1990	Highest
South West Cape	18.5	Feb-5th	1991	Highest
Oban (Stewart Island)	18.4	Feb-5th	1975	Highest
Nugget Point	17.8	Feb-5th	1972	Highest
Blenheim	21.8	Feb-5th	1947	Equal highest
Paraparaumu	20.7	Feb-5th	1972	Equal highest
Arapito	19.9	Feb-5th	1978	Equal highest
Campbell Island	13.7	Feb-2nd	1991	Equal highest
Akaroa	22.8	Feb-5th	1978	2nd-highest
Le Bons Bay	21.0	Feb-4th	1984	2nd-highest
Gore	20.9	Feb-5th	1907	2nd-highest
Te Anau	19.2	Feb-5th	1973	2nd-highest
Oamaru	18.9	Feb-3rd	1972	2nd-highest
Tautuku	18.7	Feb-5th	1976	2nd-highest
Ōkārito	18.6	Jan-31st	1983	2nd-highest
Brothers Island	18.5	Feb-2nd	1997	2nd-highest
Franz Josef	18.4	Feb-5th	1953	2nd-highest
Tiwai Point	18.4	Feb-5th	1972	2nd-highest
Kaitaia	22.2	Feb-3rd	1948	Equal 2nd-highest
Milford Sound	18.3	Feb-5th	1935	Equal 2nd-highest
Ashburton	22.3	Feb-5th	1928	3rd-highest
Winchmore	22.3	Feb-5th	1949	3rd-highest
Palmerston North	20.5	Feb-5th	1940	3rd-highest
Invercargill	20.3	Feb-5th	1905	3rd-highest
Dunedin (Musselburgh)	20.2	Feb-5th	1947	3rd-highest
Tākaka	20.2	Feb-5th	1978	3rd-highest
Motueka (Riwaka)	20.0	Feb-5th	1972	3rd-highest
Wellington (Kelburn)	19.9	Feb-5th	1931	3rd-highest
Greymouth	19.1	Jan-29th	1972	3rd-highest
Lake Tekapo	19.1	Feb-5th	1928	3rd-highest
Manapouri Airport	19.0	Feb-5th	1973	3rd-highest
Haast	18.9	Jan-31st	1949	3rd-highest
Waipounamu	17.8	Feb-2nd	1980	Equal 3rd-highest
Balclutha	17.7	Feb-5th	1972	Equal 3rd-highest
Manapouri (West Arm Jetty)	17.7	Feb-5th	1972	Equal 3rd-highest
Ngawi	23.0	Feb-5th	1972	4th-highest
Auckland (Western Springs)	21.8	Feb-4th	1971	4th-highest
Alexandra	21.3	Feb-5th	1930	4th-highest
Nelson	21.2	Feb-5th	1862	4th-highest

Levin	21.0	Feb-5th	1950	4th-highest
Roxburgh	20.8	Feb-5th	1950	4th-highest
Hāwera	19.8	Feb-4th	1977	4th-highest
Westport	19.7	Feb-3rd	1966	4th-highest
Queenstown	19.6	Feb-5th	1871	4th-highest
Ranfurly	19.1	Feb-5th	1897	4th-highest
Cromwell	21.1	Feb-5th	1949	Equal 4th-highest
New Plymouth	20.9	Feb-4th	1944	Equal 4th-highest
Purerua	20.9	Feb-3rd	1983	Equal 4th-highest
Stratford	18.7	Feb-4th	1972	Equal 4th-highest
Low records or near-records				
None observed				

Rain and slips

The highest 1-day rainfall was 316 mm, recorded at Tūtira (Hawke's Bay) on 13 February.

Starting on December 17th and persisting until the end of the month, a low-pressure system located in the Tasman Sea ushered in a humid and unstable air mass over New Zealand. This weather pattern caused daily showers and thunderstorms throughout large swaths of the country, some of which led to flooding. Notable instances of flooding occurred in South Taranaki on 19 December, which resulted in the closure of several roads, and in Hamilton on 20 December.

Between 10-11 January, the effects of ex-tropical Cyclone Hale were particularly severe in the northern and eastern regions of the North Island. Gisborne declared a state of local emergency as heavy rainfall led to flooding, slips, and road closures across Northland, north Auckland, Great Barrier Island, the Coromandel Peninsula, and Gisborne. This inclement weather also reportedly caused significant damage to crops in many areas. Additionally, the eastern Coromandel saw appreciable beach erosion due to high and rough seas. The residents of Tokomaru Bay were forced to evacuate due to flooding. The Hikuwai River north of Gisborne peaked at a height of 13.51 m, surpassing the peak height reached during Cyclone Bola in 1988 (13.31 m). In the Masterton District, heavy rainfall on 11 January led to slips and road closures, and surface flooding was reported on SH1 between Picton and Blenheim further south.

Between 27-28 January, torrential rainfall affected a large portion of the northern North Island, including Northland, Auckland, Coromandel, and the Bay of Plenty. The rainfall in Auckland broke previous records, with unprecedented maximum totals for durations of 1-hour, 2-hours, 6-hours, 12-hours, 24-hours, and 48-hours. The severe weather event caused four deaths, led to a state of emergency being declared in Auckland, and impacted at least 5,000 Auckland properties, with 77 homes red stickered. Auckland Airport was severely flooded, resulting in temporary closure, and flooding caused evacuations of homes, stranded motorists, and many people requiring rescuing. The Coromandel Peninsula was entirely cut off by road closures, and a section of SH25A collapsed, requiring closure "for quite some time." A state of emergency was declared for the Waitomo District, and the rainfall in Auckland and Māngere shattered previous records. This disastrous event capped off Auckland's wettest month since records began; the Central Auckland Rainfall series recorded a total of 539 mm of rain at Albert Park, smashing the previous monthly record of 420 mm from February 1869.

From 12-14 February, Cyclone Gabrielle caused 11 fatalities and a numerous range of other devastating impacts in New Zealand. On 12 February, Auckland Council sourced tens of thousands of sandbags for locals to help protect their homes, while MetService issued red weather warnings for

rain and/or wind in Northland, Auckland, the Coromandel Peninsula, East Cape, and Taranaki. Numerous downed trees and flooding were reported in Northland, particularly in the Whāngarei area, with Auckland’s Harbour Bridge closing until early morning on 13 February due to strong winds. Over 20,000 households were reported to have lost power in both Northland and Auckland between 12-13 February, with Northlanders warned that power outages could last for days.

On 14 February, large areas of the North Island woke up to severe flooding, slips, and power outages. A national state of emergency was declared for only the third time in New Zealand’s history. The Coromandel was cut off due to slips and flooding. Powerful winds and high seas caused all Cook Strait ferries to be cancelled. The Hikuwai River north of Tolaga Bay reached at least 14 m, prompting the evacuation of at least two dozen residents. Flooding was particularly severe in Hawke’s Bay where floodwater levels reached nearly to the roofs of homes. Floodwaters took days to subside, and hundreds of people had to be rescued by boat or helicopter. For more details on the impacts of Cyclone Gabrielle, see the [February Climate Summary](#).

On 24 February, a front became stalled across Auckland and southern Northland. Converging winds associated with this feature, as well as an upper level low pressure system, allowed it to become the focal point of widespread heavy rain and thunderstorms. Early in the afternoon, a thunderstorm led to intense downpours near Mangawhai, a town in southern Northland, leading to flooding, road closures, and serious property damage. A Northland Regional Council rain gauge “Hakaru at Tara” recorded an incredible 24-hour rainfall total of 380 mm between the morning of 24 February and the morning of 25 February. Based on available climatological data, that amount of rain would constitute over 670% of the February normal in nearby Mangawhai.

On 28 February, a sub-tropical low caused heavy rain and surface flooding in Gisborne and Hawke’s Bay, leading to some evacuations in the suburb of Mangapapa. A 30-metre section of the Napier-Taupō Rd also dropped away.

In contrast to the North Island, a lack of rainfall was a feature of the summer for many western and southern parts of the South Island. During mid-February, meteorological drought emerged in pockets of eastern Otago, with very dry to extremely dry conditions occurring across the rest of Otago, much of Southland, South Canterbury, Banks Peninsula, northern West Coast, and inland Tasman.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Tutira	316	Feb-13th	1894	Highest
Auckland (Māngere)	265	Jan-27th	1959	Highest
Auckland (Albany)	230	Jan-27th	1966	Highest
Whangārei	216	Feb-12th	1943	Highest
Auckland (Western Springs)	215	Jan-27th	1948	Highest
Pukekohe	198	Jan-27th	1944	Highest
Napier	176	Feb-13th	1870	Highest
Mt Ruapehu (Chateau)	154	Feb-12th	2000	Highest
Hastings	126	Feb-13th	1967	Highest
Whakatu	122	Feb-13th	1967	Highest
Waipawa	117	Feb-13th	1945	Highest

Auckland (Whenuapai)	190	Jan-27th	1943	2nd-highest
Whangapoua	137	Jan-27th	1991	2nd-highest
Waiawa	109	Jan-11th	1968	2nd-highest
Mokohinau	106	Jan-27th	1994	2nd-highest
Takapau Plains	105	Feb-13th	1962	2nd-highest
Karapiro	78	Jan-27th	2001	2nd-highest
Leigh	165	Feb-13th	1967	3rd-highest
Rings Beach	134	Jan-9th	1986	3rd-highest
Gisborne	131	Feb-13th	1937	3rd-highest
Waihau	117	Jan-10th	1985	3rd-highest
Waiheke Island	94	Jan-27th	1980	3rd-highest
Te Kaihi	93	Jan-28th	1995	3rd-highest
Pongaroa	70	Jan-6th	1973	3rd-highest
Chiltern	184	Jan-9th	1950	4th-highest
Kaikohe	143	Feb-12th	1956	4th-highest
Warkworth	131	Jan-27th	1967	4th-highest
Whatawhata	119	Jan-27th	1952	4th-highest
Tūrangi	115	Jan-28th	1968	4th-highest
Mangakowhai	108	Jan-28th	1995	4th-highest
Wairoa	102	Feb-27th	1967	4th-highest
Tiri Tiri Lighthouse	101	Jan-31st	1946	4th-highest
Kawhia	85	Jan-27th	1905	4th-highest
Port Taharoa	84	Jan-27th	1973	4th-highest
Akaroa	80	Feb-15th	1977	4th-highest

Wind

The highest wind gust was 150 km/h, observed at Mokohinau on 12 February.

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

Location	Extreme wind gust (km/h)	Date of extreme gust	Year records began	Comments
Mokohinau	150	Feb-12th	1994	Highest
Dargaville	128	Feb-13th	1997	Highest
Kaitia	109	Feb-13th	1972	Highest
Taupō	107	Feb-14th	1982	Highest
New Plymouth	128	Feb-14th	1972	Equal highest
Whangārei	102	Feb-13th	1973	Equal highest
Mt Ruapehu (Chateau)	124	Feb-13th	2000	2nd-highest
Te Puke	70	Feb-13th	1987	2nd-highest
Cape Reinga	141	Jan-3rd	1974	3rd-highest
Tauranga	91	Feb-13th	1973	Equal 3rd-highest
Whakatu	89	Feb-13th	1997	Equal 3rd-highest
Auckland (Western Springs)	82	Feb-14th	1994	Equal 3rd-highest
Kaikohe	82	Jan-31st	1986	Equal 3rd-highest
Hāwera	98	Feb-14th	1986	4th-highest
Whanganui	98	Feb-14th	1977	4th-highest

Rotorua	95	Feb-13th	1972	4th-highest
Gisborne	91	Feb-13th	1972	4th-highest
Tūrangi	96	Feb-14th	1973	Equal 4th-highest

Snow and ice

On 22 February, a strong southerly change resulted in sub-freezing temperatures and snow across the tops of the Southern Alps. Mueller Hut (Aoraki Mt Cook National Park) observed its first sub-freezing temperatures since 3 December. More than 30 centimetres fell at Mt Hutt, Canterbury, which saw visitors skiing and snowboarding during the mountain's open day on 25 February.

Lightning, hail, and tornadoes

On 17 December, a tornado moved through rural Alexandra and Springvale, causing extensive damage to some properties. This included a house whose roof was partially torn off and a shed that was destroyed.

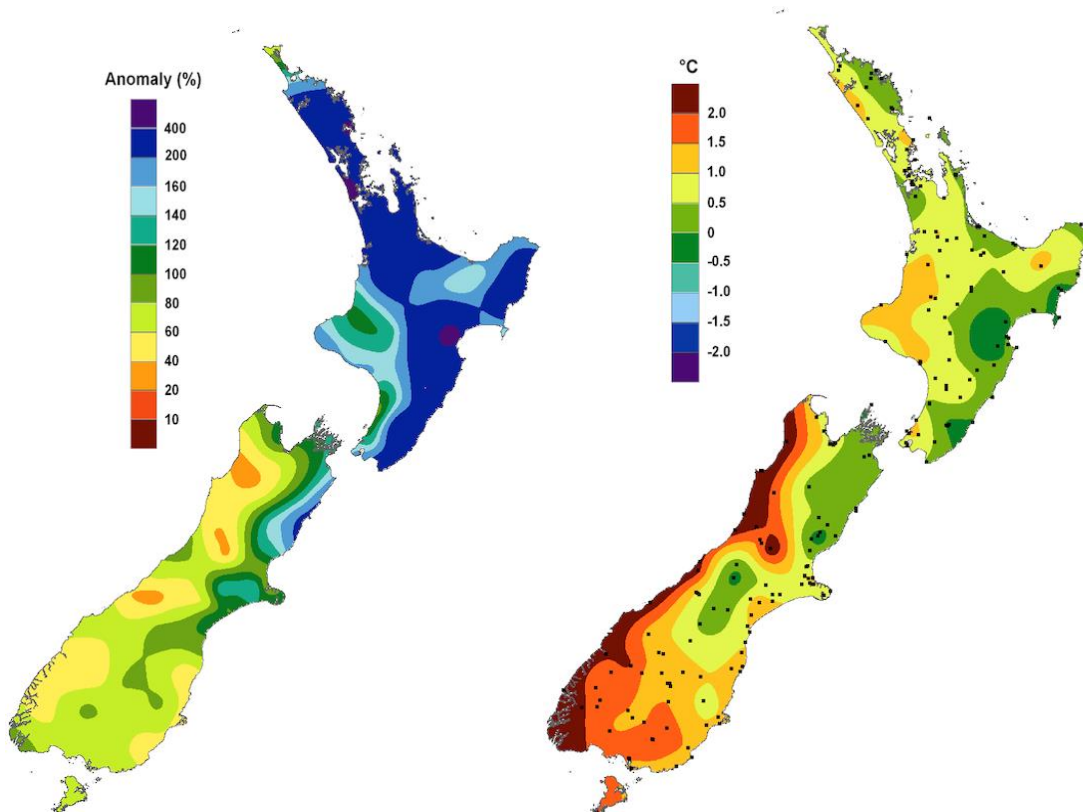
On the morning of 25 February around 9:00 a.m., a tornado was spotted in Waihi Beach, damaging homes, cars, trees, and cutting power to nearly 2500 properties. Based on photo evidence, it initially appeared to be a waterspout (tornado over the water) before moving onto land, thus becoming a tornado.

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Summer rainfall

Expressed as a percentage of the 1991-2020 normal.

Summer temperature

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

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

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