



2020: New Zealand’s 7th-warmest year on record

Temperature	Annual temperatures were above average (+0.51°C to +1.20°C above the annual average) across much of the North Island, and parts of every South Island region. Near average (within -0.50°C to +0.50°C of average) temperatures occurred in Southland, eastern and inland Otago, coastal Canterbury, West Coast, Marlborough, coastal parts of the lower North Island, and the Central Plateau. 2020 was the 7th-warmest year on record for New Zealand, based on NIWA’s seven-station series which began in 1909.
Rainfall	Annual rainfall was below normal (50-79% of normal) across many northern, eastern and inland parts of the North Island, and parts of Marlborough, Canterbury and eastern Otago. Rainfall was near normal (80-119% of normal) for most remaining areas of the country including eastern parts of Northland, the Central Plateau, western and southern parts of the North Island, Nelson, West Coast, inland Otago and Southland.
Soil moisture	A dry start to the year contributed to drier than normal soils across much of the country during summer. By the end of February, severe meteorological drought was in place across Northland, Auckland, much of Waikato, western Bay of Plenty, East Cape, and southern Marlborough, while meteorological drought was found from Gisborne to Bay of Plenty and south to Manawatū-Whanganui and eastern Taranaki. Soil moisture levels returned to near normal for many areas during the middle of the year, but by the end of spring drier than normal soils were present for northern parts of the North Island and southern parts of the South Island. By the end of December, soils were drier than normal for the upper North Island, but wetter than normal for coastal areas from Taranaki through to Wellington, the Nelson-Tasman region and northern Otago.
Sunshine	The Bay of Plenty experienced New Zealand’s highest annual sunshine total during 2020 (2704 hours recorded at Whakatāne).

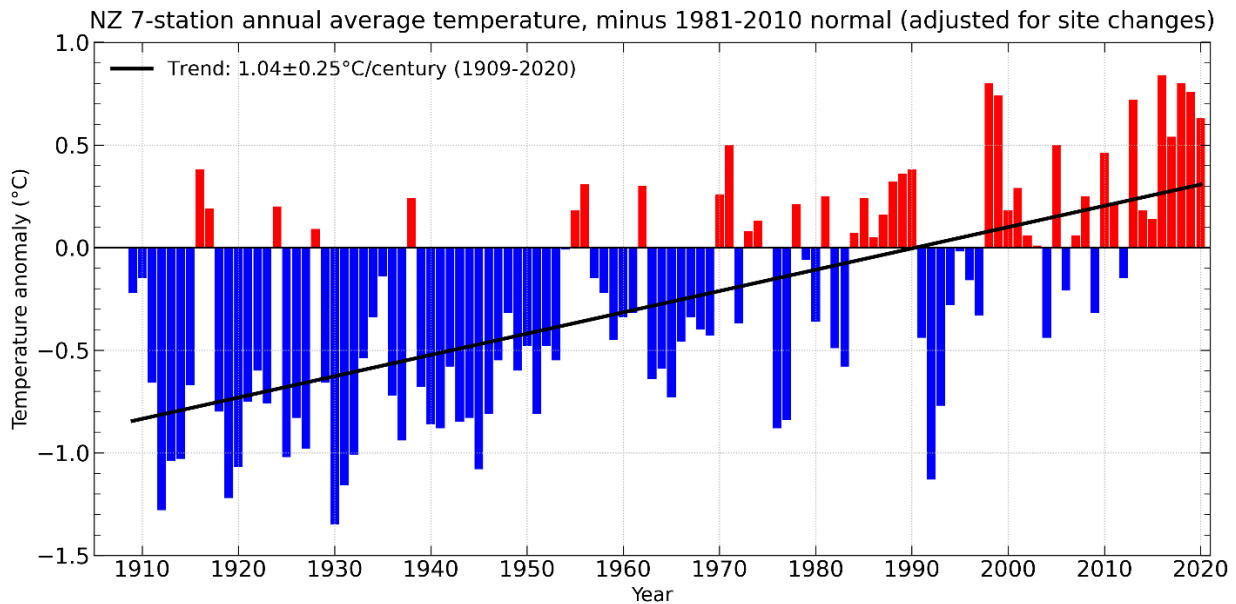
Click on the following links to jump to the information you require:

- [Overview](#)
- [The year in review](#)
- [Monthly temperature maps](#)
- [Monthly rainfall maps](#)
- [Observations and statistics](#)
- [Annual temperature](#)
- [Annual rainfall](#)
- [2020 climate in the six main centres](#)
- [Significant weather and climate events in 2020](#)

Overview

2020 was Aotearoa New Zealand’s 7th-warmest year on record. The nationwide average temperature for 2020, calculated using stations in NIWA’s seven-station temperature series which began in 1909, was 13.24°C (0.63°C above the 1981–2010 annual average). New Zealand’s hottest year on record remains 2016, when the nationwide average temperature was 13.45°C (0.84°C above the 1981–2010 annual average). Based on the seven-station series, 2020 featured six months with above average temperatures (greater than +0.50°C of average), six months with near average temperatures (within -0.50°C to +0.50°C of average), and

no months with below average temperatures (less than -0.50°C of average). It has now been 47 months since New Zealand has had a month with below average temperatures (the last such month was January 2017). Furthermore, six of the past eight years have been amongst New Zealand's hottest on record. This trend is consistent with the overall pattern of global warming.



Historical nation-wide annual temperature anomalies (degrees above or below the 1981-2010 normal) from NIWA's seven-station temperature series which begins in 1909. Six of the past eight years have been among New Zealand's warmest on record.

The hottest spell of the year took hold over New Zealand from late-January to early-February, with several locations observing their highest daily maximum and daily minimum temperatures on record. The highest temperature of 2020 was recorded on 31 January at Gisborne. The maximum temperature there reached 38.2°C , which is New Zealand's 5th-highest January temperature on record, and the country's 19th-equal hottest temperature on record for all months. This period of warmth coincided with the latter stages of an extended dry spell¹ for many areas of the country. Several locations observed dry spells of at least 40 days (see [Drought and low rainfall](#) section of this summary for further details). Most notably, a 64-day dry spell was recorded in Blenheim. It lasted from 20 December 2019 to 21 February 2020, making it the longest dry spell on record at the town.

From late-March to late-April, high pressure prevailed over the country, delivering mild and very dry conditions for many areas. Several locations in Wairarapa, coastal Marlborough and coastal North Canterbury recorded less than 5 mm of rain during April. It was a continuation of the dry start to the year for parts of Northland, Auckland, Waikato, Bay of Plenty and Hawke's Bay, where January-April rainfall totals were less than 40% of normal, respectively. A key contributing factor to the year's dry start was a near-record positive Indian Ocean Dipole². This persisted from late-2019 into early-2020, preventing plumes of tropical moisture (known as "atmospheric rivers") from forming north of the country. Atmospheric rivers are an important moisture source for New Zealand, but these were largely non-existent over the country in late-summer and early-autumn.

¹ A dry spell is defined as a period of 15 days or more with less than 1mm of rain on any one day.

² A climate phenomenon where sea surface temperatures are above average in the western Indian Ocean and correspondingly below average in the east near Sumatra (hence the term "dipole").

Winter was much wetter than usual in northern parts of the North Island, which saw soil moisture levels return to near normal after the persistent dryness observed earlier in the year. Seasonal snow experienced a marked mid-winter hiatus, with very little snowfall at most of NIWA's high elevation observation sites from late-July through much of August. At the end of August, the depth of accumulated snow at Mueller Hut near Mt Cook was the lowest in 10-years of record, with less than 45% of average depth. Several ski areas in Canterbury struggled to operate throughout the season due to a lack of snow. This was largely as a result of abnormally warm temperatures, with New Zealand observing its warmest winter on record. New snowfall in late-winter and early-spring brought snow depths up to average for the time of year at most of NIWA's high elevation observation sites. It took until late-September for the coldest outbreak of the year to occur. Snow fell to sea level in Southland and Otago during this time, and daytime temperatures on 29 September struggled to exceed 0°C for coastal parts of these regions.

October and November were warm months for the country, with the former month featuring mostly dry conditions. A large fire fanned by strong winds struck Lake Ōhau Alpine Village in early October, which destroyed approximately 50 homes. In contrast to the dryness of October, November was quite a wet month for much of the country. An exceptional heavy rain event occurred in Napier, with 242 mm of rain recorded on 9 November. It was the city's 2nd-wettest day on record, with records beginning in 1870. Napier ended the month with 325 mm of rain: 601% (i.e., 6 times) of normal for November. A lack of rainfall contributed to dry conditions in December for northern parts of the North Island, with water restrictions introduced for several towns in the Far North, and Tauranga establishing a ban on the use of sprinklers.

For 2020 overall, the New Zealand region³ had an average mean sea level pressure (MSLP) of 1015.4 hPa, 1.3 hPa above the long-term 1981-2010 average. This was the 6th-highest annual MSLP value observed in the New Zealand region since records began in 1948. The Southern Annular Mode (SAM), a ring of Southern Hemisphere climate variability, was positive 61% of the time during 2020. The positive SAM phase is associated with higher than normal air pressure around New Zealand, which tends to bring more tranquil weather conditions to the country. However, Wellington was an exception in September: the monthly mean wind speed was 24.8 km/h, making it the city's highest monthly mean wind speed since October 2009.

Early in the year, the El Niño Southern Oscillation (ENSO) phase was neutral. This phase persisted through May, before an increase in tropical trade winds contributed to cooling ocean temperatures about the equatorial Pacific. Accordingly, a La Niña Watch was put into place in June, which transitioned to a La Niña Alert in August as the atmosphere began to respond to the changes in the tropical Pacific Ocean. For New Zealand, air flow anomalies transitioned to northeasterly during winter, which persisted in the North Island through spring — a traditional hallmark of La Niña. In October, La Niña conditions were officially acknowledged and continued through the end of the year.

Section 1: The year in review

The monthly sequence of New Zealand climate was as follows:

January 2020: A month of two halves regarding temperature, very dry for many

The first half of the month was relatively cold, with many locations on track to observe record or near-record low temperatures. However, much warmer conditions prevailed during the second half of the month due to frequent northerly and northwesterly airflow. Overall, temperatures were above average (0.51-1.20°C above average) in parts of interior Canterbury and Otago, northern Tasman, eastern Northland,

³ Averaged over the area inclusive of 34-48°S, 165-179°E as calculated using the NCEP/NCAR Reanalysis.

Coromandel, Bay of Plenty, Gisborne and Hawke's Bay. Small portions of below average temperatures (0.51-1.20°C below average) were experienced in coastal Westland and south Canterbury, western Waikato and southern parts of the Wellington region. It was a very dry January with much of the country observing rainfall below (50-79% of normal) to well below (<50% of normal) normal. Parts of upper North Island and upper and eastern South Island received less than 10% of their normal January rainfall. By the end of January, soil moisture levels were lower than normal for the entire North Island and much of the South Island. Meteorological drought was present in much of the upper North Island, with severe meteorological drought in northern Auckland, southern Northland, and the Aupouri Peninsula according to NIWA's [New Zealand Drought Index](#).

February 2020: Dry in the North Island; flooding in the lower South Island

February was very dry across the North Island with most locations observing well below normal rainfall. Some locations in Northland and the central North Island received less than 10% of their normal February rainfall. Well below normal rainfall also occurred across Nelson and Marlborough. Rainfall was generally below normal from Taranaki to Kapiti Coast as well as much of Tasman and northern Canterbury. Conversely, rainfall was above normal (120-149% of normal) or well above normal (>149% of normal) across much of the lower West Coast, Otago, and Southland. Heavy rainfall early in the month caused severe flooding in Fiordland, Otago and inland Southland, particularly along the Maitai River. It was a warm month across New Zealand, with above average to well above average (>1.20°C above average) temperatures observed across nearly all of the North Island as well as much of the upper and central South Island. At the end of the month, severe meteorological drought was in place across Northland, Auckland, much of Waikato, western Bay of Plenty, East Cape, and southern Marlborough, while meteorological drought was found from Gisborne to Bay of Plenty and south to Manawatū-Whanganui and eastern Taranaki.

March 2020: Dry for many locations; temperatures near to below average

March was dry for many locations in New Zealand, with below normal to well below normal rainfall observed in much of the upper North Island, Hawke's Bay, Tasman, Nelson, much of Marlborough, and large parts of Otago. Conversely, rainfall was above normal or well above normal in the lower North Island, northern Canterbury, and a small portion of western Waikato. Temperatures were near average ($\pm 0.50^\circ\text{C}$ of average) across a vast majority of the North Island, Tasman, and West Coast. Below average and isolated well below average ($< 1.20^\circ\text{C}$ below average) temperatures were observed across much of the eastern and lower South Island. Meteorological drought receded significantly during March, but remained in place at the end of the month across parts of Northland, Auckland, and far northern Waikato. In addition, severe meteorological drought was found across the Coromandel Peninsula.

April 2020: Very dry for many parts of New Zealand

Rainfall was well below normal or below normal for most of the North Island, Nelson, Tasman, Marlborough, Canterbury and eastern parts of Central Otago. Several locations in Wairarapa, coastal Marlborough and coastal North Canterbury received less than 5 mm of rain for the entire month. Rainfall was above normal for some western parts of the South Island and Oamaru. Temperatures were above average for parts of Waikato, Bay of Plenty, Gisborne, Hawke's Bay, Wairarapa, Manawatū, Canterbury, eastern Central Otago and Southland. At the end of the month, soil moisture levels were considerably lower than normal for most of the North Island, as well as northern parts of the South Island. Soils were also drier than normal for many eastern parts of the South Island.

May 2020: Warm and dry for the middle and lower South Island

Rainfall was below normal or well below normal for locations in the middle and lower South Island, with increasing dryness toward the east of these areas. Parts of the upper South Island observed above normal or

well above normal rainfall. In the North Island, rainfall was below normal for many locations between the upper Waikato and lower Manawatū-Whanganui. Most locations in the Auckland and Wellington regions experienced near or above normal May rainfall, while rainfall in Northland was below normal to the west and above normal to the east. Temperatures were above average or well above average for many locations in the middle and lower South Island as well as the western parts of the Tasman District. Temperatures were also above average along the eastern margins of the North Island. Isolated areas around lower Marlborough and between Taumarunui and Tūrangi observed below average temperatures. At the end of the month, soils were drier than normal for many northern, central and eastern parts of the North Island, as well as eastern, inland and southern parts of the South Island.

June 2020: Warm start to winter for much of the country

It was New Zealand's 5th-warmest June on record. Temperatures were above average or well above average throughout the North Island, as well as northern, central and western parts of the South Island. Rainfall was above normal or well above normal for parts of Northland, Auckland, Bay of Plenty, Gisborne, Hawke's Bay, western Taranaki, Wellington, eastern Canterbury, and inland parts of Otago. Rainfall was below normal or well below normal for southern, western and northwestern parts of the South Island, inland parts of Manawatū-Whanganui, and western parts of Waikato. At the end of the month, soil moisture levels were lower than normal for eastern and inland parts of Otago, south Canterbury, and inland parts of Manawatū-Whanganui.

July 2020: Very wet in Northland, dry for many remaining areas

Rainfall was well above normal or above normal for Northland, western Otago and inland parts of Southland. Rainfall was below normal or well below normal for parts of all remaining North Island regions, and much of the northern, eastern and inland areas of the South Island. Temperatures were above average or near average for most of the country. Above average temperatures were mostly observed in central and northwestern parts of the South Island, and northern, western and southern parts of the North Island. At the end of the month, soil moisture levels were lower than normal for eastern parts of Otago and Canterbury (south of Ashburton).

August 2020: A warm and dry finish to winter

It was New Zealand's 4th-warmest August on record. Temperatures were above average or well above average for most of the country. It was a particularly dry month for eastern and inland parts of Canterbury and North Otago, where less than 20% of normal August rainfall was recorded. Rainfall was below normal or well below normal in parts of almost every region. Rainfall was above normal or well above normal in Northland and northern Auckland. At the end of the month, soil moisture levels were lower than normal in eastern parts of the South Island, and southern parts of the North Island. Soils were considerably drier than normal in eastern parts of south Canterbury and north Otago.

September 2020: Dry for northern North Island, wet for much of South Island

Rainfall was well below normal for much of Northland, Auckland, Coromandel Peninsula, and Bay of Plenty. Below normal rainfall was observed in much of Waikato, East Cape, Gisborne and coastal parts of northern Taranaki. Above normal or well above normal rainfall was observed in much of the South Island and the southern North Island including Southland, western and central Otago, north Canterbury, the northern West Coast, Wellington, Wairarapa, the Kapiti Coast and Manawatū-Whanganui. Temperatures were near average for most of the country. Temperatures were above average in eastern parts of Otago, Canterbury, Hawke's Bay and Gisborne, as well as northern parts of Tasman and Marlborough. At the end of the month, soil moisture was lower than normal for eastern parts of Otago and Canterbury from Dunedin to Christchurch, as well as parts of Northland, Auckland, coastal Bay of Plenty and East Cape. Soil moisture was higher than normal in parts of western Otago and eastern Marlborough.

October 2020: A warm and dry month for much of New Zealand

Rainfall was well below normal for parts of Northland, Auckland, northern Waikato, Bay of Plenty, Gisborne, Wairarapa, Marlborough, and central Canterbury. Below normal rainfall was observed in nearly all remaining portions of the North Island, as well as Nelson and northern Canterbury. Conversely, above normal rainfall was widespread across the West Coast, Fiordland, much of Southland, and Stewart Island. Temperatures were above average or well above average across all of the North Island and nearly all of the South Island, except for parts of eastern Otago where temperatures were near average. At the end of the month, soil moisture was lower than normal across the northern third of the North Island, Wairarapa, Marlborough, and central Canterbury south to eastern Otago. Soil moisture was considerably lower than normal in coastal Bay of Plenty, East Cape, Wairarapa, and central Canterbury. Soil moisture was higher than normal in interior Manawatū-Whanganui, northern Tasman, and Southland.

November 2020: Wet and warm for much of New Zealand

Over double the normal November rainfall total (>200% of normal) was recorded for parts of Waikato, Bay of Plenty, central North Island, Hawke's Bay, Taranaki, Wellington, Nelson and Tasman. Other areas that experienced above or well above normal rainfall were the remainder of the North Island except for the Far North, East Cape, and western Waikato. Most of Marlborough, Canterbury and Buller also experienced above or well above normal rainfall. Well below normal rainfall was experienced in much of Southland, Fiordland, and the southern half of the West Coast. Temperatures were well above average for areas of eastern Northland, Auckland, Coromandel, Bay of Plenty, Taranaki, Gisborne, and the West Coast. For most other parts of New Zealand, temperatures were above average, except for Wellington, Marlborough and parts of Canterbury which had near average temperatures. By the end of November, soil moisture levels were higher than normal for most of the North Island south of Hamilton, as well as Nelson and Tasman. Soil moisture levels were lower than normal for much of Northland to northern Waikato and the southern half of the South Island.

December 2020: A dry and mild end to the year

Well below normal rainfall was experienced in much of the upper and eastern North Island while coastal Taranaki and Manawatū-Whanganui saw near normal (80-119% of normal) or above normal rainfall. In the South Island, rainfall was largely well below or below normal, with the exception of a few locations in coastal Canterbury and Stewart Island that saw above normal rainfall. Temperatures were near average for much of the country. The exceptions were small pockets of above average temperatures in Northland, Coromandel, the Bay of Plenty and Tasman. At the end of the month, soil moisture levels were lower than normal for the upper North Island and higher than normal for coastal areas from Taranaki through to Wellington, for the Nelson-Tasman region and for northern Otago.

Section 2: Monthly temperature (in °C, as a departure from the 1981-2010 monthly averages)

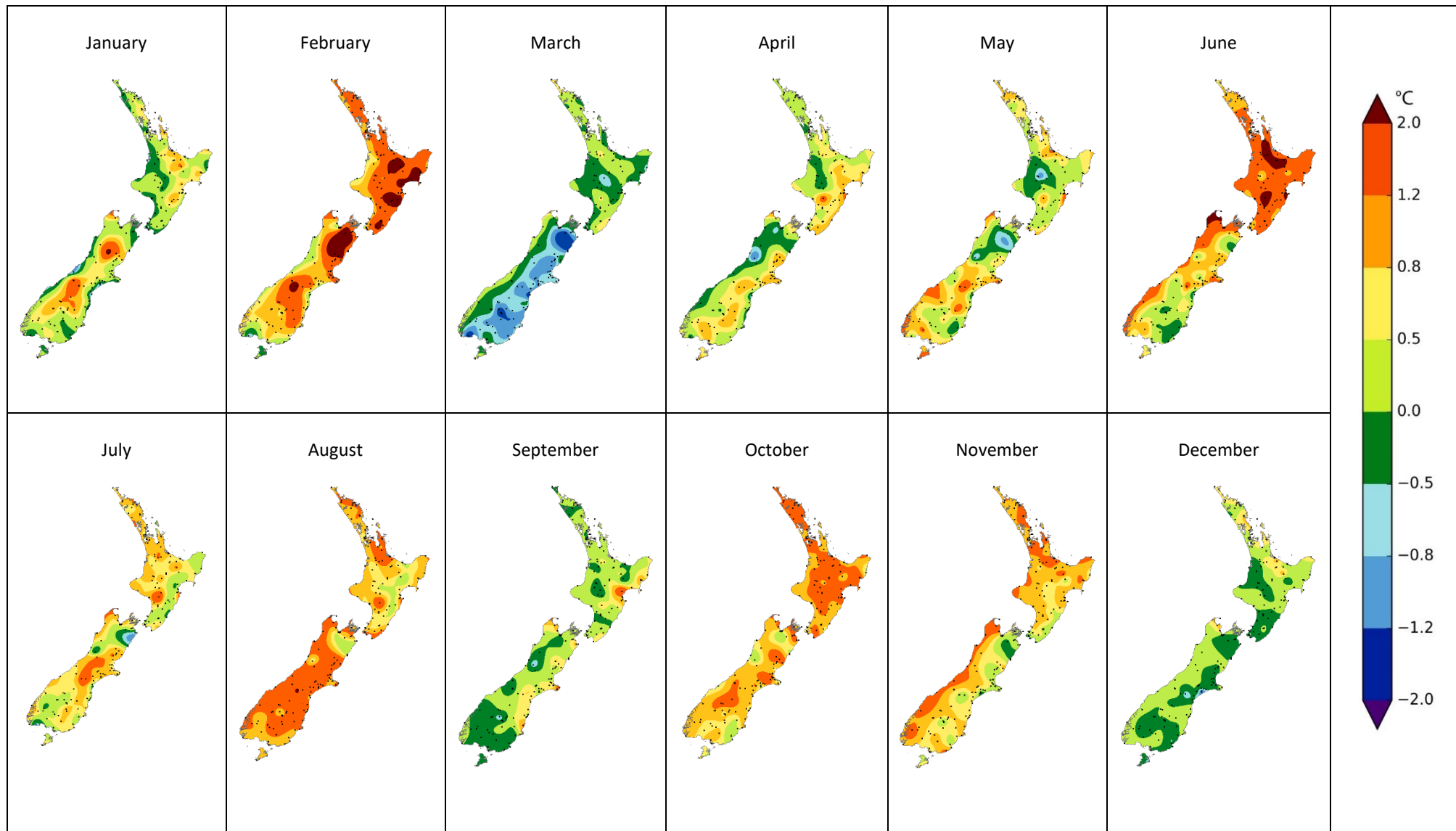


Figure 1: Monthly temperature anomalies (compared to the 1981-2010 monthly averages) for each month of 2020.

Section 3: Monthly rainfall (as a percentage of the 1981-2010 monthly normals)

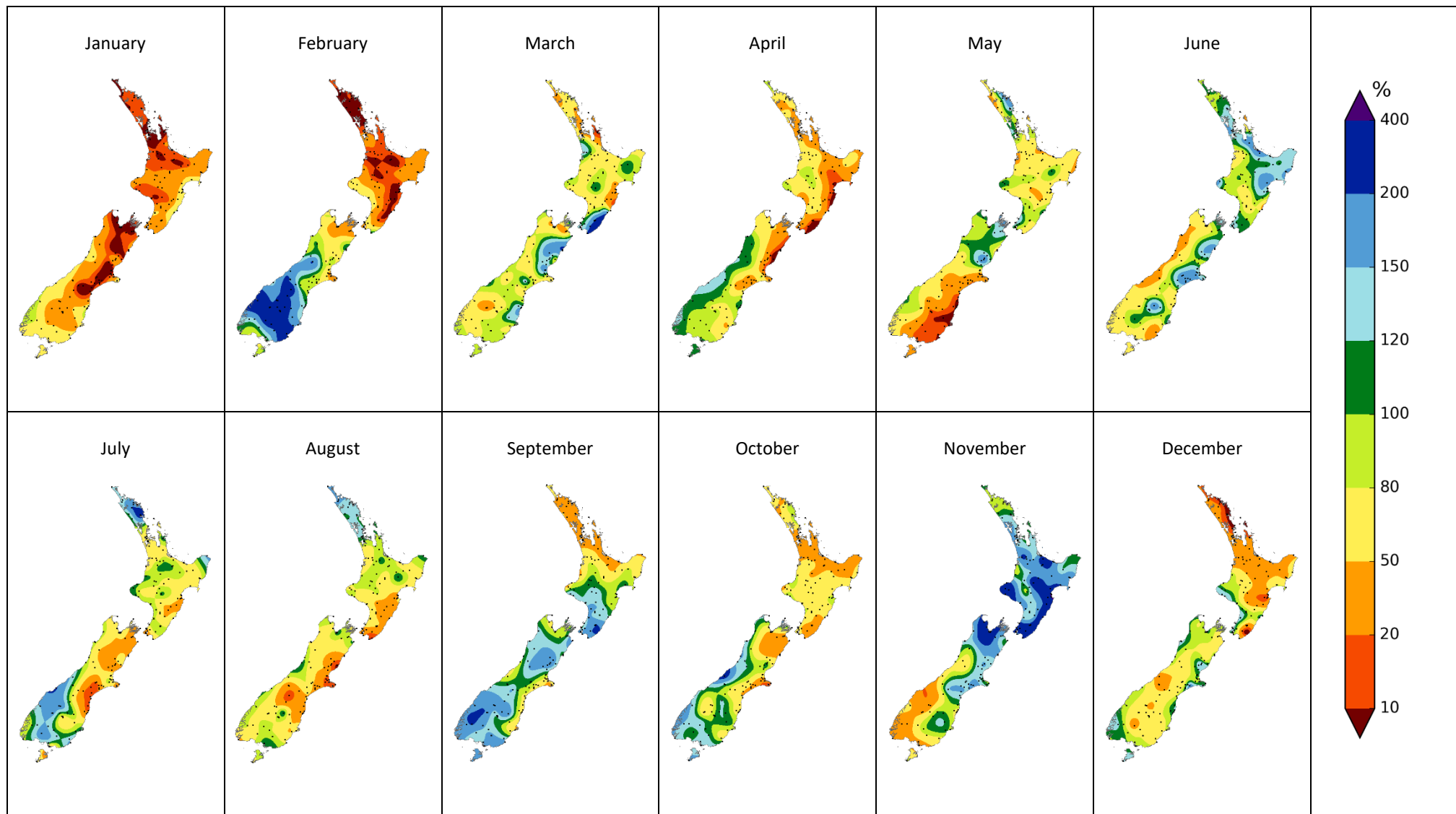


Figure 2: Monthly rainfall as a percentage of each 1981-2010 monthly normal for each month of 2020.

Section 4: Observations and statistics

Based on data available at the time of writing, NIWA analyses of month-by-month records show:

- The nationwide average temperature for 2020 was 13.24°C (0.63°C above the 1981–2010 annual average). Using NIWA’s seven-station temperature series, 2020 was the 7th-warmest year on record since records began in 1909.
- Leigh recorded the highest annual average temperature for 2020 with 16.9°C, followed by Whangārei and Kaitaia with 16.6°C.
- The highest air temperature of the year was 38.2°C, recorded at Gisborne on 31 January. This was followed by 37.4°C at Napier and 37.3°C at Wairoa, which both occurred on 2 February.
- The lowest air temperature of the year was -12.3°C recorded at Middlemarch, followed by -10.7°C at Ophir and -9.9°C at Clyde. These temperatures were all observed on 14 June.
- The top three daily rainfall totals from regularly reporting gauges in 2020 were 509 mm at Milford Sound on 3 February, 327 mm at Mueller Hut on 4 February, and 289 mm at North Egmont on 24 May.
- The top three daily rainfall totals from regularly reporting gauges in 2020 *excluding* high elevation stations were: 509 mm at Milford Sound on 3 February, 262 mm at Kaihohe on 17 July, and 251 mm at Whangārei on 17 July.
- Of all the regularly reporting gauges, the wettest locations in 2020 were: Cropp River (West Coast, 975 metres above sea level) with 11,532 mm, Tuke River (West Coast, 975 metres above sea level) with 10,584 mm, and Haast River (West Coast, 58 metres above sea level) with 8,340 mm.
- Of the regularly reporting gauges, the wettest locations in 2020 *excluding* high elevation stations were: Milford Sound with 7,421 mm, Pigeon Creek with 4,269 mm, and Arthur’s Pass with 4,181 mm.
- The lowest rainfall recording locations for 2020 were Hakataramea Valley with 205 mm, Alexandra with 314 mm, and Bromley (eastern Christchurch) with 317 mm.
- The Bay of Plenty experienced New Zealand’s highest annual sunshine total during 2020 (2704 hours recorded at Whakatāne), followed by the wider Nelson region (2632 hours - Richmond) and Marlborough (2603 hours - Blenheim).
- The highest confirmed wind gust for 2020 was 198 km/h recorded at Cape Turnagain on 31 January.
- Of the six main centres in 2020, Auckland was the warmest, Dunedin was the coolest, Wellington was the wettest, Christchurch was the driest, Tauranga was the sunniest and Dunedin was the least sunny.

Ranked annual total rainfall, mean temperatures and sunshine hours for the stations available at time of writing are displayed on the following five pages. Some sites have missing days of data. The number of missing days is indicated by a superscript number next to the annual value in the tables below.

Location	Rainfall (mm)
CROPP AT WATERFALL	11532
TUKE AT TUKE HUT	10584
CROPP AT CROPP HUT	8841 ¹⁵
HAAST AT CRON CK	8340
DOON AT MIDDLE ARM	8216
IVORY GLACIER CWS	7721
MILFORD SOUND EWS	7421
HOKITIKA AT PRICES FLAT	7355
HOKITIKA AT COLLIERS CK	7039
HOKITIKA RAPID CK	6959
WIAHO AT DOUGLAS HUT	6786
HAAST AT ROARING BILLY	6000
WHATAROA AT SHB	5517
MT PHILISTINE EWS	5198
RAKAIA AT LAKE RAMSAY	5037
GODLEY AT EADE HUT	4727
PIGEON CREEK CWS	4269 ¹
ARTHUR'S PASS AWS	4181 ¹¹
ARTHUR'S PASS EWS	4062
FRANZ JOSEF EWS	3980 ¹⁴
MANAPOURI, WEST ARM JETTY EWS	3864
MT COOK EWS	3696 ⁸
HAAST AWS	3390 ¹⁷
ALBERT BURN	3051 ⁵
MURCHISON MTNS EWS	3012
HOKITIKA AERO	2825 ¹
HOKITIKA AWS	2716 ²
HOKITIKA EWS	2588 ¹
PUYSEGUR POINT AWS	2471 ¹⁷

WAITUTU CWS	2462
MAHANGA EWS	2435
MT RUAPEHU, CHATEAU EWS	2320
GREYMOUTH AERO EWS	2254
EGLINTON, KNOBS FLAT CWS	2181
WESTPORT AERO AWS	2146 ³
WESTPORT EWS	2093
MT COOK AERO AWS	2014 ¹¹
UPPER RAKAIA EWS	1965
ARAPITO EWS	1894
STRATFORD EWS	1812
AWAKINO EWS	1697 ⁶
KERIKERI AERODROME AWS	1673
MOTU EWS	1628
REEFTON EWS	1547
KERIKERI EWS	1486
KAIKOHE AWS	1478 ⁷
SOUTH WEST CAPE AWS	1443 ¹⁵
RUSSELL CWS	1418
NEW PLYMOUTH AWS	1415 ⁵
WHANGĀREI AERO AWS	1395
TE PUKE EWS	1333
WHITIANGA EWS	1333
WHITIANGA AERO AWS	1308 ¹¹
WELLINGTON, KELBURN 2	1285
TE KUITI EWS	1268
PUREORA FOREST CWS	1266
WELLINGTON, KELBURN AWS	1262 ⁵
MANAIA, MOTUMATE STM	1260
WHANGĀREI EWS	1256
TAUMARUNUI EWS	1243

LOWER RETARUKE CWS	1233
TŪRANGI 2 EWS	1209 ²
TROUNSON CWS	1178
UPPER HUTT, TRENTHAM EWS	1172 ¹
HICKS BAY AWS	1171 ¹²
MAUNGARAKI 3	1153
WHATAWHATA 2 EWS	1150
AKITIO EWS	1145
PARAPARAUMU AERO	1144
MANAPOURI AERO AWS	1143 ⁵
FAREWELL SPIT AWS	1139 ¹¹
WAIROA AERO AWS	1115 ¹¹
INVERCARGILL AERO	1106 ³
PARAPARAUMU EWS	1076
WELLINGTON, GRETA POINT CWS	1063
BIRCHWOOD WXT AWS	1058 ¹²
LEVIN EWS	1056
TAUMARUNUI AWS	1052 ¹⁶
ROTORUA AERO AWS	1052 ³
OHAKUNE EWS	1042 ⁴
HĀWERA AWS	1035 ¹²
WELLINGTON AERO	1026
MOTUEKA, RIWAKA EWS	1017 ³
WAIOURU EWS	1017 ¹
AUCKLAND, WHENUAPAI AWS	1014 ¹
PARAPARAUMU AERO AWS	1010 ¹
WAIROA, NORTH CLYDE EWS	997
KAITAIA AERO AWS	988 ⁹
GORE AWS	986 ⁹
LEVIN AWS	986 ⁷
KAITAIA AERO EWS	983

INVERCARGILL AERO 2 EWS	982
INVERCARGILL AERO AWS	981
ROTORUA EWS	968
MASTERTON AERO AWS	964
PAHIATUA EWS	952
AUCKLAND, NORTH SHORE ALBANY EWS	924
MASTERTON, TE ORE ORE CWS	923
FIVE RIVERS CWS	922
KAITAIA EWS	920 ⁷
MASTERTON, TE ORE ORE SRIG	915
HANMER FOREST EWS	914
PUKEKOHE EWS	913
WAIKERIA EWS	906 ⁵
HAMILTON AWS	905 ¹
PAEROA AWS	904 ¹³
KAIKŌURA, MIDDLE CREEK	900
WAIPOUNAMU CWS	896
GORE EWS	893 ¹
WHAKATĀNE EWS	879
LUMSDEN AWS	877 ¹¹
GISBORNE AWS	872 ¹
NELSON AERO	853
NGAWI AWS	852 ³
QUEENSTOWN EWS	848 ¹
MAYFIELD AT RUAPUNA	846 ¹
PORT TAHAROA AWS	840 ⁶
RICHMOND EWS	839 ¹
CAPE REINGA AWS	839 ⁹
OHAKEA AWS	832 ⁷
DARGAVILLE 2 EWS	830
PALMERSTON NORTH EWS	826

WAIPARA NORTH BRANCH @ LANGS GULLY	825
WHANGANUI, SPRIGGENS PARK EWS	821 ¹⁷
BALMORAL EAST CWS	817 ¹
AUCKLAND, MOTAT EWS	817
MANA ISLAND AWS	816 ¹³
PURERUA AWS	812 ¹⁰
WHANGANUI AWS	812
NELSON AWS	810
MATAMATA, HINUERA EWS	810 ⁵
WHAKATĀNE AERO AWS	806 ¹
PALMERSTON NORTH AWS	806 ³
AUCKLAND AERO	794 ¹
DANNEVIRKE EWS	783
TAURANGA AERO AWS	775 ²
HAMILTON, RUAKURA 2 EWS	754
TAKAPAU PLAINS AWS	743 ¹⁴
TAUPŌ AWS	741 ²
GISBORNE EWS	737 ¹⁰
FIRTH OF THAMES EWS	736
MARTINBOROUGH EWS	735
NAPIER EWS	732
AUCKLAND, MĀNGERE 2 EWS	719
LEIGH 2 EWS	715 ⁷
LAKE KARAPIRO CWS	702
METHVEN, THREE SPRINGS CWS	691 ¹
MASTERTON EWS	681 ¹⁸
QUEENSTOWN AERO AWS	677 ¹⁷
FLAT HILLS WXT AWS	641 ⁶
AKAROA EWS	636
BALCLUTHA, TELFORD EWS	636 ⁶
GALATEA AWS	634 ¹⁴

NAPIER AERO AWS	628
WAIAU SCHOOL CWS	624
METHVEN CWS	613 ¹
CULVERDEN AWS	601 ¹¹
DUNEDIN, MUSSELBURGH EWS	600
WĀNAKA CWS	596 ⁸
KAIKŌURA AWS	593 ⁶
BARING HEAD	574 ¹
WĀNAKA AERO AWS	565 ¹
OHOKA CWS	564
PUKAKI AERODROME AWS	550
MEDBURY CWS	550
WAIPARA WEST EWS	541
CHEVIOT EWS	529 ⁶
CHRISTCHURCH AERO	517
DUNEDIN AERO AWS	514
MARAEKAKAHO CWS	510 ¹³
WAIPAWA EWS	506
BLENHEIM AERO AWS	505 ²
ASHBURTON AERO AWS	497 ¹⁰
WINCHMORE 2 EWS	492
ORARI ESTATE CWS	491 ¹
OAMARU AWS	489 ¹
RANGIORA EWS	480
DIAMOND HARBOUR EWS	466
HASTINGS AWS	463 ¹⁶
BLENHEIM RESEARCH EWS	461
CHERTSEY CWS	453
LAUDER EWS	449
FAIRLIE AWS	446 ¹¹
TARA HILLS AWS	445 ⁹

LAKE TEKAPO EWS	435 ¹⁸
WAKANUI 2 CWS	434
LE BONS BAY AWS	423 ⁸
CAPE CAMPBELL AWS	418 ⁵
CHRISTCHURCH, KYLE ST EWS	412
OAMARU AIRPORT AWS	406 ¹
RANFURLY EWS	400
LINCOLN, BROADFIELD EWS	400 ¹
ALEXANDRA AWS	392 ¹⁰
WAIMATE CWS	373 ¹¹
TIMARU EWS	367
OAMARU EWS	364
MIDDLEMARCH EWS	359 ¹
ALEXANDRA CWS	357
WINDSOR EWS	354
CLYDE 2 EWS	352 ¹⁰
TIMARU AERO AWS	349
CROMWELL EWS	342
BROMLEY EWS	317
ALEXANDRA EWS	314
HAKATARAMEA VALLEY CWS	205
Location	Mean temp(°C)
LEIGH 2 EWS	16.9
WHANGĀREI AERO AWS	16.6
KAITAIA AERO EWS	16.6
CAPE REINGA AWS	16.4
PURERUA AWS	16.3
WHANGĀREI EWS	16.3
KAITAIA EWS	16.2
AUCKLAND AERO	16.1

RUSSELL CWS	16.1
AUCKLAND, MĀNGERE 2 EWS	16.0
DARGAVILLE 2 EWS	16.0
KERIKERI EWS	16.0
KERIKERI AERODROME AWS	15.9
AUCKLAND, MOTAT EWS	15.9
WAIROA, NORTH CLYDE EWS	15.9
TAURANGA AERO AWS	15.8
HICKS BAY AWS	15.8
WHITIANGA EWS	15.7
PORT TAHAROA AWS	15.6
AUCKLAND, NORTH SHORE ALBANY EWS	15.5
LAKE KARAPIRO CWS	15.5
WHITIANGA AERO AWS	15.4
KAIKOHE AWS	15.4
GISBORNE EWS	15.3
AUCKLAND, WHENUAPAI AWS	15.3
GISBORNE AWS	15.2
PAEROA AWS	15.2
PUKEKOHE EWS	15.2
NGAWI AWS	15.1
NAPIER EWS	15.0
WHAKATĀNE EWS	15.0
WHAKATĀNE AERO AWS	14.9
MAHIA AWS	14.8
TROUNSON CWS	14.8
NAPIER AERO AWS	14.7
FIRTH OF THAMES EWS	14.7
HASTINGS AWS	14.7
HAMILTON, RUAKURA 2 EWS	14.6
WHATAWHATA 2 EWS	14.4

WAIROA AERO AWS	14.3
WELLINGTON AERO	14.2
MATAMATA, HINUERA EWS	14.2
WHANGANUI AWS	14.2
HAMILTON AWS	14.1
TE KUITI EWS	14.1
NEW PLYMOUTH AWS	14.1
PALMERSTON NORTH AWS	13.9
PALMERSTON NORTH EWS	13.9
LEVIN AWS	13.8
WHAKATU EWS	13.8
OHAKEA AWS	13.7
MARTINBOROUGH EWS	13.7
BLENHEIM RESEARCH EWS	13.6
NELSON AWS	13.6
PORIRUA, ELSDON PARK AWS	13.6
PARAPARAUMU EWS	13.6
PARAPARAUMU AERO AWS	13.5
ARAPITO EWS	13.5
TAUMARUNUI EWS	13.5
AKAROA EWS	13.5
WAIPAWA EWS	13.4
ROTORUA AERO AWS	13.3
CAPE CAMPBELL AWS	13.3
LEVIN EWS	13.3
WELLINGTON, KELBURN AWS	13.3
GALATEA AWS	13.3
WESTPORT EWS	13.3
MASTERTON, TE ORE ORE CWS	13.3
CHRISTCHURCH, KYLE ST EWS	13.2
BARING HEAD	13.2

HĀWERA AWS	13.2
DANNEVIRKE EWS	13.2
KAIKŌURA AWS	13.1
WAIKERIA EWS	13.1
MANA ISLAND AWS	13.1
WESTPORT AERO AWS	13.1
RICHMOND EWS	13.1
BLENHEIM AERO AWS	13.1
BROMLEY EWS	13.1
MASTERTON EWS	13.1
PAHIATUA EWS	13.1
UPPER HUTT, TRENTHAM EWS	13.0
FLAT HILLS WXT AWS	13.0
LOWER RETARUKE CWS	13.0
AKITIO EWS	12.9
WAIPARA WEST EWS	12.9
MASTERTON AERO AWS	12.9
DIAMOND HARBOUR EWS	12.8
GREYMOUTH AERO EWS	12.7
TAUMARUNUI AWS	12.7
WAIKOUKOU SCHOOL CWS	12.6
LINCOLN, BROADFIELD EWS	12.5
CHEVIOT EWS	12.5
MEDBURY CWS	12.4
STRATFORD EWS	12.4
CHERTSEY CWS	12.3
TAKAPAU PLAINS AWS	12.3
CHRISTCHURCH AERO	12.2
TAUPŌ AWS	12.2
HOKITIKA AWS	12.1
HOKITIKA EWS	12.1

RANGIORA EWS	12.1
REEFTON EWS	12.0
CULVERDEN AWS	12.0
LE BONNS BAY AWS	12.0
TŪRANGI 2 EWS	12.0
MOTU EWS	11.9
ASHBURTON AERO AWS	11.8
WAKANUI 2 CWS	11.7
OHOKA CWS	11.7
ALEXANDRA CWS	11.7
METHVEN CWS	11.7
KAIKŌURA, MIDDLE CREEK	11.7
PUYSEGUR POINT AWS	11.6
DUNEDIN, MUSSELBURGH EWS	11.6
PIGEON CREEK CWS	11.6
ROXBURGH WXT AWS	11.5
WAIPARA NORTH BRANCH @ LANGS GULLY CWS	11.4
WĀNAKA AERO AWS	11.4
BALMORAL EAST CWS	11.4
ORARI ESTATE CWS	11.4
METHVEN, THREE SPRINGS CWS	11.3
WINCHMORE 2 EWS	11.3
HANMER FOREST EWS	11.3
QUEENSTOWN EWS	11.2
HAKATARAMEA VALLEY CWS	11.2
MILFORD SOUND EWS	11.1
ALEXANDRA EWS	11.1
PUREORA FOREST CWS	11.1
OAMARU EWS	11.0
MILFORD SOUND AWS	11.0
TIMARU AERO AWS	11.0

FAIRLIE AWS	10.9
CROMWELL EWS	10.9
WINDSOR EWS	10.9
ALEXANDRA AWS	10.8
OAMARU AIRPORT AWS	10.8
TIWAI POINT EWS	10.6
NUGGET POINT AWS	10.5
INVERCARGILL AERO AWS	10.5
TIMARU EWS	10.4
QUEENSTOWN AERO AWS	10.4
BIRCHWOOD WXT AWS	10.4
GORE AWS	10.4
DUNEDIN AERO AWS	10.4
INVERCARGILL AERO 2 EWS	10.3
MIDDLEMARCH EWS	10.3
LAUDER EWS	10.2
GORE EWS	10.1
TARA HILLS AWS	10.1
FIVE RIVERS CWS	10.1
PUKAKI AERODROME AWS	10.0
WAIPOUNAMU CWS	10.0
RANFURLY EWS	9.9
LUMSDEN AWS	9.8
MANAPOURI AERO AWS	9.7
WAIOURU EWS	9.7
MANAPOURI, WEST ARM JETTY EWS	9.6
MT COOK AERO AWS	9.5
WAIOURU AIRSTRIP AWS	9.3
ARTHUR'S PASS AWS	8.3
ARTHUR'S PASS EWS	8.2
TAKAHE VALLEY CWS	6.3

MURCHISON MTNS EWS	5.9
ALBERT BURN	5.9
IVORY GLACIER CWS	4.8
MT PHILISTINE EWS	4.0
UPPER RAKAIA EWS	3.9
MT POTTS EWS	1.8
Location	Sunshine (hours)
WHAKATĀNE	2704
RICHMOND EWS	2632 ^{<1}
BLENHEIM RESEARCH EWS	2603 ^{<1}
NEW PLYMOUTH AWS	2600 ^{<1}
ROTORUA EWS	2587
NAPIER EWS	2577 ¹
GISBORNE AWS	2474 ¹
TAURANGA AERO	2473
AUCKLAND, MOTAT EWS	2450
LAKE TEKAPO EWS	2383 ¹⁸
AUCKLAND, MĀNGERE 2 EWS	2377
NELSON AERO	2375
CROMWELL EWS	2370
ALEXANDRA EWS	2369
QUEENSTOWN AERO AWS	2359 ¹
TŪRANGI 2 EWS	2358 ²
DIAMOND HARBOUR EWS	2330 ¹
BROMLEY EWS	2329
CHEVIOT EWS	2306 ¹¹
MASTERTON EWS	2271
WINCHMORE 2 EWS	2266
AUCKLAND, NORTH SHORE ALBANY EWS	2263

PARAPARAUMU AERO AWS	2263 ¹
KAWERAU AWS	2245 ¹⁴
LEVIN EWS	2237 ¹
WAIPARA WEST EWS	2236
AKITIO EWS	2224
OAMARU EWS	2222
WESTPORT EWS	2220 ¹
RANGIORA EWS	2202
ASHBURTON AERO AWS	2189 ¹¹
PARAPARAUMU EWS	2182 ¹
LINCOLN, BROADFIELD EWS	2176 ¹
CHRISTCHURCH AERO	2166 ¹
AKAROA EWS	2152 ²
HAMILTON, RUAKURA 2 EWS	2150 ¹
DARGAVILLE 2 EWS	2148
HOKITIKA AWS	2142 ²
WHANGĀREI EWS	2138
KAITAIA EWS	2127 ⁴
STRATFORD EWS	2127
WAIKERIA EWS	2116 ⁶
WELLINGTON, KELBURN AWS	2110
DUNEDIN, MUSSELBURGH EWS	2108 ¹
TE KUITI EWS	2098
UPPER HUTT, TRENTAM EWS	2087 ¹
PARAPARAUMU AERO	2069 ¹
TAUMARUNUI AWS	1999 ¹²
WAIPAWA EWS	1982 ³
GREYMOUTH AERO EWS	1885 ¹¹
REEFTON EWS	1875

ARAPITO EWS	1869 ¹
INVERCARGILL AERO 2 EWS	1841 ³
MIDDLEMARCH EWS	1839 ²
GORE EWS	1838 ³
HOKITIKA AERO	1833 ¹
DANNEVIRKE EWS	1828
INVERCARGILL AERO	1827 ³
MARTINBOROUGH EWS	1812 ²
PALMERSTON NORTH EWS	1764 ¹
FRANZ JOSEF EWS	1757 ¹⁸
BALCLUTHA, TELFORD EWS	1581 ⁶

Section 5: Annual temperature – record or near-record warmth for many locations

2020 was New Zealand’s 7th-warmest year on record based on NIWA’s seven-station series, which began in 1909. Many locations observed record or near-record high mean, mean maximum, and mean minimum temperatures. It was the warmest year on record for Wairoa, Medbury and Cheviot.

Table 1: Record or near-record high or low annual average temperature departures for 2020⁴.

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
Mean temperature				
Wairoa	15.9	1.6	1964	Highest
Medbury	12.4	1.0	1927	Highest
Cheviot	12.5	1.0	1982	Highest
Cape Reinga	16.4	0.6	1951	2nd-highest
Te Puke	15.0	1.0	1973	2nd-highest
Hanmer Forest	11.3	1.0	1906	2nd-highest
Kerikeri	16.0	0.7	1945	3rd-highest
Whangārei	16.6	0.8	1967	3rd-highest
Hicks Bay	15.8	0.9	1969	3rd-highest
Waipawa	13.4	0.6	1945	3rd-highest
Waiau	12.6	1.2	1974	3rd-highest
Le Bons Bay	12.0	0.6	1984	3rd-highest
Ranfurly	9.9	1.0	1897	3rd-highest
Auckland (Whenuapai)	15.3	0.6	1945	4th-highest
Whitianga	15.7	1.0	1962	4th-highest
Motu	11.9	1.1	1990	4th-highest
Auckland (Airport)	16.1	0.6	1959	4th-highest
Porirua	13.6	0.3	1968	4th-highest
Arapito	13.5	0.8	1978	4th-highest
Motueka	13.3	0.8	1956	4th-highest
Mean maximum temperature				
Whangārei	21.6	1.7	1967	Highest
Matamata	20.4	1.6	1999	Highest
Te Kuiti	20.8	2.0	1959	Highest
Waipawa	19.8	1.6	1945	Highest
Wairoa	21.5	2.2	1964	Highest
Stratford	17.1	1.0	1960	Highest
Hanmer Forest	19.4	2.4	1906	Highest
Medbury	18.7	1.2	1927	Highest
Cheviot	18.7	1.3	1982	Highest

⁴ The rankings (1st, 2nd, 3rd....etc) in Tables 1 to 11 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 because of the practical limitations of performing homogeneity checks in real-time.

Auckland (Whenuapai)	20.1	1.0	1945	2nd-highest
Whitianga	21.1	1.8	1962	2nd-highest
Tauranga	20.3	1.2	1913	2nd-highest
Te Puke	19.8	0.8	1973	2nd-highest
Hamilton (Ruakura)	20.7	1.8	1906	2nd-highest
Tūrangi	18.1	1.0	1968	2nd-highest
Blenheim	19.3	0.9	1932	2nd-highest
Waiau	19.0	1.3	1974	2nd-highest
Le Bons Bay	15.3	0.8	1984	2nd-highest
Ranfurly	16.7	1.6	1897	2nd-highest
Kerikeri	21.1	1.0	1945	3rd-highest
Leigh	21.4	2.5	1966	3rd-highest
Paeroa	20.3	0.7	1947	3rd-highest
Motu	17.1	1.7	1990	3rd-highest
Auckland (Airport)	20.0	1.0	1959	3rd-highest
Hamilton (Airport)	20.0	1.0	1946	3rd-highest
Hicks Bay	19.2	1.2	1969	3rd-highest
Hastings	20.3	1.8	1965	3rd-highest
Arapito	18.1	0.9	1978	3rd-highest
Greymouth	16.7	0.8	1947	3rd-highest
Waipara West	18.6	0.5	1973	3rd-highest
Whakatāne	20.2	0.7	1974	4th-highest
Porirua	17.3	0.4	1968	4th-highest
Wānaka	17.1	1.0	1955	4th-highest
Mean minimum temperature				
Port Taharoa	12.6	1.0	1973	3rd-highest
Wairoa	10.3	1.0	1964	3rd-highest
Te Puke	10.1	1.2	1973	4th-highest
Martinborough	8.5	0.8	1986	4th-highest
Porirua	9.8	0.1	1968	4th-highest
Hāwera	9.4	0.6	1977	4th-highest
Secretary Island	9.5	0.7	1985	4th-highest
Medbury	6.1	0.8	1927	4th-highest
Cheviot	6.2	0.6	1982	4th-highest
Mt Cook Village	4.4	0.8	1929	4th-highest
Te Anau	5.9	1.4	1963	4th-highest
Te Kuiti	7.4	-1.0	1959	2nd-lowest
Taumarunui	6.4	-0.9	1947	4th-lowest

During 2020 several high record and near-record extreme temperatures occurred. Most notably, record and near-record high temperatures occurred from late-January to early-February. On 2 February, Whakatāne set a new all-time record as the temperature reached 33.9°C, but this record was smashed the very next day as the maximum temperature on 3 February reached 36.4°C. Whangārei set a new all-time record when the temperature reached 32.8°C on 3 February, but this record was exceeded the next day on 4 February as the maximum temperature reached 34.1°C. Gisborne reached 38.2°C on 31 January which was New Zealand’s 19th-equal warmest temperature on record.

Table 2: Record or near-record high or low annual temperature extremes for 2020.

Location	Temperature (°C)	Date of occurrence	Year records began	Comments
Highest extreme maximum temperatures				
Whangārei	34.1	Feb-4th	1967	Highest
Whitianga	33.1	Feb-1st	1962	Highest
Whakatāne	36.4	Feb-3rd	1975	Highest
Motu	32.5	Feb-3rd	1990	Highest
Akaroa	35.5	Feb-2nd	1978	Equal highest
Kerikeri	33.2	Feb-1st	1945	2nd-highest
Kaikohe	31.6	Feb-3rd	1973	2nd-highest
Tauranga	33.6	Feb-1st	1913	2nd-highest
Te Kuiti	32.0	Jan-26th	1959	2nd-highest
Wairoa	37.3	Feb-2nd	1964	2nd-highest
Whanganui	31.3	Feb-4th	1937	2nd-highest
Motueka	33.1	Jan-23rd	1956	2nd-highest
Five Rivers	30.8	Jan-24th	1982	2nd-highest
Auckland (Airport)	29.8	Feb-4th	1959	3rd-highest
Dannevirke	32.6	Feb-4th	1951	3rd-highest
Ranfurly	33.2	Jan-24th	1897	4th-highest
Lowest extreme maximum temperatures				
Tiwai Point	2.3	Jul-17th	1972	Lowest
Five Rivers	0.0	Jul-16th	1982	Equal 3rd-lowest
Highest extreme minimum temperatures				
Upper Hutt (Trentham)	21.4	Feb-4th	1972	Highest
Waiau	24.4	Feb-3rd	1974	Highest
Rangiora	22.1	Feb-3rd	1972	Highest
Akaroa	23.8	Feb-3rd	1978	Highest
Milford Sound	18.0	Feb-3rd	1935	2nd-highest
Arthur's Pass	16.0	Jan-27th	1973	2nd-highest
Medbury	23.2	Feb-3rd	1927	2nd-highest
Waipara West	24.1	Feb-3rd	1973	2nd-highest
Blenheim	21.7	Feb-3rd	1947	Equal 2nd-highest
Martinborough	21.7	Feb-4th	1986	3rd-highest
Hanmer Forest	21.5	Feb-17th	1972	3rd-highest
Five Rivers	19.5	Feb-2nd	1982	3rd-highest
Greymouth	18.5	Feb-4th	1972	Equal 3rd-highest
Arapito	19.0	Feb-4th	1978	4th-highest
Motu	17.5	Jan-29th	1990	Equal 4th-highest
Lowest extreme minimum temperatures				
None observed				

Section 6: Annual rainfall – a dry year for the upper North Island

2020 was a dry year for many parts of the upper North Island. Several locations observed record or near-record low rainfall amounts. Auckland (Māngere and Western Springs), Hamilton (Ruakura) and Whatawhata all had their driest year on record. No locations observed record or near-record high rainfall totals for the year.

Table 3: Record or near-record annual rainfall totals for the year 2020.

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
High records or near-records				
None observed				
Low records or near-records				
Auckland (Western Springs)	817	68	1948	Lowest
Auckland (Māngere)	719	65	1959	Lowest
Whatawhata	1150	71	1952	Lowest
Hamilton (Ruakura)	754	67	1905	Lowest
Lower Retaruke	1233	79	1966	2nd-lowest
Dargaville	830	73	1943	3rd-lowest
Whitianga	1333	72	1961	3rd-lowest
Rotorua	968	59	1963	3rd-lowest
Dannevirke	783	76	1951	3rd-lowest
Reefton	1547	80	1960	3rd-lowest
Akaroa	636	66	1977	3rd-lowest
Oamaru	364	77	1941	3rd-lowest
Kaitaia	983	78	1948	4th-lowest
Pukekohe	913	71	1944	4th-lowest

A widespread heavy rainfall event in early February caused flooding in parts of Southland and Otago. Lauder (Central Otago) observed 84 mm of rain on 4 February, making it the settlements wettest day since records began in 1924. Similarly notable rainfall events occurred in Whāngarei in July, and Napier in November, with each city observing their 2nd-highest 1-day rainfall total on record.

Table 4: Record or near-record high extreme 1-day rainfall totals that occurred in 2020.

Location	1-day extreme rainfall (mm)	Date	Year records began	Comments
Lauder	84	Feb-4th	1924	Highest
Whangārei	251	Jul-17th	1943	2nd-highest
Napier	242	Nov-9th	1870	2nd-highest
Waipounamu	81	Feb-3rd	1917	3rd-highest
Milford Sound	509	Feb-3rd	1929	4th-highest

Section 7: 2020 climate in the six main centres

It was a very dry year for the three northernmost main centres where rainfall ranged from 65-75% of normal, respectively. It was Auckland's (Māngere) driest year on record, with records there dating back to 1959. Temperatures were near or above average at all main centres. Tauranga's mean daily maximum temperature (20.3°C) was its 2nd-highest since records began in 1913. Of the six main centres in 2020, Auckland was the warmest, Dunedin was the coolest, Wellington was the wettest, Christchurch was the driest, Tauranga was the sunniest and Dunedin was the least sunny.

Table 5: 2020 climate in the six main centres.

Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland ^a	719	65%	Below normal (Lowest on record)
Tauranga ^b	775 ⁵	65%	Below normal
Hamilton ^c	905 ⁶	75%	Below normal
Wellington ^d	1262 ⁷	104%	Near normal
Christchurch ^e	517	87%	Near normal
Dunedin ^f	600	81%	Near normal
Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland ^a	16.0	+0.6	Above average
Tauranga ^b	15.8	+0.9	Above average
Hamilton ^c	14.1	+0.5	Near average
Wellington ^d	13.3	+0.4	Near average
Christchurch ^e	12.2	+0.6	Above average
Dunedin ^f	11.6	+0.5	Near average
Sunshine			
Location	Sunshine (hours)		
Auckland ^a	2377		
Tauranga ^b	2473		
Hamilton ^g	2150		
Wellington ^d	2110		
Christchurch ^e	2166 ⁶		
Dunedin ^f	2108 ⁶		

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

⁵ Missing 2 days of data

⁶ Missing 1 day of data

⁷ Missing 5 days of data

Section 8: Significant weather and climate events in 2020

This section contains information pertaining to some of the more significant weather and climate events that occurred in 2020. Note that a more detailed list of significant weather events for 2020 can be found in the *Highlights and extreme events* section of NIWA's Monthly Climate Summaries. These summaries are available online at <https://niwa.co.nz/climate/summaries>.

Drought and low rainfall

From late-December 2019 through until February 2020, several locations observed record or near-record dry spells (defined as consecutive days with less than 1 mm of rain) across New Zealand, including:

- Auckland area – 47 days (6 Jan-21 Feb), longest on record;
- Whangārei – 38 days (15 Jan-21 Feb), 2nd-longest on record;
- Whitianga – 34 days (15 Jan-17 Feb), longest on record;
- Takaka – 46 days (20 Dec-3 Feb), longest on record;
- Blenheim – 64 days (20 Dec-21 Feb), longest on record;
- Cheviot – 49 days (21 Dec-7 Feb), longest on record;
- Culverden – 45 days (21 Dec-3 Feb), 2nd-longest on record;
- Rangiora – 45 days (21 Dec-3 Feb), 2nd-longest on record;
- Hanmer Forest – 40 days (26 Dec-3 Feb), longest on record.

On 12 March, Agriculture Minister Damien O'Connor classified the drought in the North Island, upper South Island, and the Chatham Islands as a large-scale adverse event, unlocking up to \$2 million in government funding to support farmers and growers through to June 2021. Drought relief was also extended to Wairarapa and Hawke's Bay with \$90,000 in funding.

On 15 April, *Watercare* reported that Auckland's nine water storage dams were only 50% full, saying such low levels in April had not been seen since 1994. On 17 April, drought conditions in Northland were reported as the worst experienced there in at least 20 years.

Floods and high rainfall

On 3-4 February, torrential rain and flooding impacted Fiordland, cutting off State Highway (SH) 94 between Te Anau and Milford Sound and leaving more than 380 people stranded. SH94 was badly damaged and remained closed to private vehicles for the entire month, with a partial reopening for bus convoys occurring towards the end of February. A State of Emergency was declared in Milford Sound, and the Department of Conservation said that damage to the Routeburn Track was so severe that it would remain closed for the rest of the season, while the Milford Track would be closed for at least three weeks.

A State of Emergency was declared in Southland and residents in parts of Gore, Mataura, and Wyndham were told to evacuate due to flooding on the Mataura River, which peaked at 2500 cumecs at Gore on 5 February, and nearly 2700 cumecs at Mataura. This State of Emergency was originally put in place until 11 February, but was then extended until 18 February. A boil water notice was also issued for residents in Mataura, the Otama Water Supply scheme, and all flood-affected Southland residents who use groundwater. More than 2400 people were evacuated from their homes in Gore along with more than 1500 people in Mataura. *Dairy NZ* stated that more than 100 dairy farms were severely impacted by the flooding. Dozens of roads were closed due to the flooding in Southland and Otago, including SH1 between Dunedin and Invercargill, SH94, SH97, SH6 between Queenstown and Kingston, and portions of SH90.

On 17 July, very heavy rain and thunderstorms hammered much of Northland. Civil Defence welfare centres were activated as people were forced to leave their homes due to flooding. Approximately 65 homes were evacuated, and four of these homes were left uninhabitable due to damage sustained by floodwaters. Police advised against non-essential travel throughout Northland due to widespread and considerable flooding, particularly about Whangārei. Whangārei (Airport) observed 50.8 mm of rain in the hour between 9-10 p.m., which was the city’s 2nd-highest hourly rainfall total for all months on record (records began 1978). Several road closures resulted from the heavy rain and floods, including SH1 between Ohaeawai and Kawakawa. Heavy rain also fell over the Coromandel Peninsula causing widespread flooding and road closures. As shown in Table 6, Kaikohe, Kerikeri and Whangārei each observed their wettest July day on record.

On 9 November a local State of Emergency was declared in Napier due to widespread flooding causing landslips, power cuts and evacuations. Approximately 3300 homes were without power overnight and at least 14 roads and streets were closed due to slips. Napier's Nelson Park recorded 242.4 mm of rain on that day which was the wettest November and wettest spring day on record for Napier, with records going back to 1870. It was the 2nd-wettest day in the entire record (the record is 297 mm on 3 June 1963).

Table 6: Record high monthly extreme 1-day rainfall totals were recorded in 2020 at:

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Ranking
January				
None observed				
February				
Queenstown	81	3rd	1890	Highest
Waipounamu	81	3rd	1917	Highest
Lauder	84	4th	1924	Highest
Ophir	74	4th	1924	Highest
Tapanui	82	3rd	1897	Highest
Mandeville	77	3rd	1967	Highest
March				
Lichfield	76	22nd	1996	Highest
Glenthorne Lower Station	57	27th	1985	Highest

April				
None observed				
May				
Whitianga	163	30th	1961	Highest
Coroglen, Coromandel	200	30th	1988	Highest
Lake Mangamahoe	195	4th	1971	Highest
June				
Waiheke Is. (Awaroa Valley)	119	24th	1980	Highest
Rainbow Point	53	27th	1978	Highest
Living Springs	70	28th	1978	Highest
Greenpark	58	28th	1956	Highest
July				
Kerikeri	175	17th	1945	Highest
Kaikohe	262	17th	1956	Highest
Whangārei	251	17th	1943	Highest
Hicks Bay	101	16th	1916	Highest
Tautuku	45	6th	1976	Highest
August				
None observed				
September				
Lower Whataroa	155	22nd	1949	Highest
October				
Plains Station	67	25th	1950	Highest
Tiwai Point	48	3rd	1970	Highest
November				
Napier	242	9th	1870	Highest
December				
None observed				

Temperature extremes

On 31 January, Gisborne recorded 38.2°C. This was New Zealand's 5th-highest January temperature on record.

On 1 February, Whitianga reached 33.1°C, the hottest temperature recorded there since records began in 1962. (The previous record was 33.0°C in February 2017). As mentioned earlier in the summary, Whakatāne and Whangārei set a new all-time record high temperatures on 2 and 3 February, respectively, only for each location to further exceed these records on the following day.

On 30 August, Timaru recorded a maximum temperature of 25.1°C. This was the city's highest temperature on record for winter. This was additionally New Zealand's equal 4th-highest winter temperature on record overall.

From 28-30 September, a bitterly cold southerly outbreak brought unseasonably low temperatures to many parts of the South Island. The coldest air of the system passed over during 29 September, when several locations observed record or near-record low daily maximum temperatures for

September. The prevalence of negative air temperatures at many low elevation coastal locations on 29 September indicates that the free air freezing level was situated at around sea level (0 m elevation), which is particularly remarkable given the time of year. The air was so cold as it was sourced from Antarctica, and travelled on a relatively direct path towards New Zealand (Figure 3). The southerly airflow was established by a very deep low pressure system in the Southern Ocean, with central air pressures as low as 938 hPa. This system met the criteria of a “bomb cyclone” as it strengthened at a pace of ≥ 24 hPa in 24 hours. The cold air temperatures combined with strong winds resulted in severe wind chill factors, which created stress for livestock, and meant it felt much colder than the measured air temperature. At Nugget Point between 9-10 a.m., the lowest temperature was -1.1°C and the maximum wind gust was 137.1 km/h, resulting in a wind-chill temperature of -13.5°C .

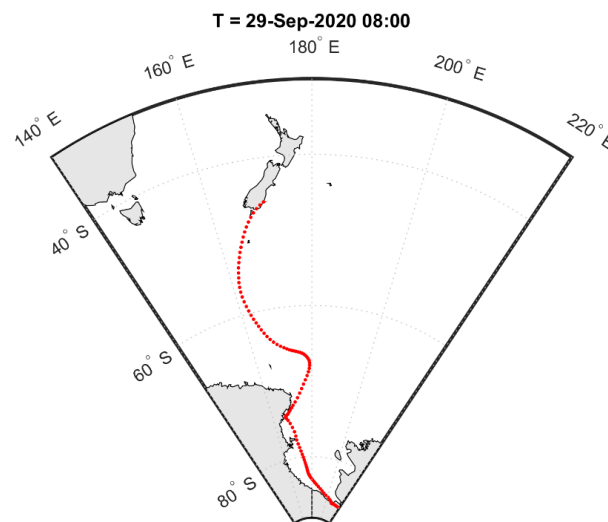


Figure 3. HYSPLIT trajectory output for 8 a.m. 29 September 2020 (NZDT) out to -120 hours. The red-dotted trace indicates the 5-day track of the airmass that started over Antarctica at 8 a.m. on 24 September 2020, and arrived over Dunedin at 8 a.m. on 29 September 2020. Data credit: NOAA Air Resources Laboratory. Image credit: Todd Redpath.

On a given day (24-hour period) at New Zealand locations, the daily minimum temperature observed typically occurs overnight under clear skies and light winds. Remarkably, this wasn’t the case for several low elevation locations where on 29 September, the lowest daily temperatures were observed near the middle of the day. Locations where this occurred included Dunedin (Musselburgh; -0.2°C between 10-11 a.m.), Balclutha (-0.7°C between 12-1 p.m.) and Tiwai Point (-1.5°C between 10-11 a.m.). Nugget Point recorded its lowest ever September temperature of -1.4°C between 11 a.m. and midday.

Table 7: Extremes of high daily maximum temperature in 2020 were recorded at:

Location	Extreme maximum ($^{\circ}\text{C}$)	Date of extreme temperature	Year records began	Ranking
January				
Paeroa	32.2	26th	1947	Highest
Matamata	32.8	26th	1999	Highest

Taupō	33.2	26th	1949	Highest
Motu	31.1	31st	1990	Highest
Hicks Bay	30.6	31st	1969	Highest
Gisborne	38.2	31st	1905	Highest
Mahia	32.6	31st	1990	Highest
Takaka	34.6	28th	1978	Highest
Puysegur Point	24.9	24th	1978	Highest
February				
Kaitiāia	30.7	2nd	1948	Highest
Kerikeri	33.2	1st	1945	Highest
Whangārei	34.1	4th	1967	Highest
Whitianga	33.1	1st	1962	Highest
Tauranga	33.6	1st	1913	Highest
Te Puke	33.0	3rd	1973	Highest
Whakatāne	36.4	3rd	1975	Highest
Motu	32.5	3rd	1990	Highest
Takapau Plains	33.8	4th	1962	Highest
Hicks Bay	31.8	2nd	1969	Highest
Waipawa	36.9	4th	1945	Highest
Whanganui	31.6	4th	1937	Highest
Akaroa	35.5	2nd	1978	Highest
Le Bons Bay	32.2	2nd	1984	Highest
Wairoa	37.3	2nd	1964	Equal highest
March				
Whitianga	30.3	4th	1962	Highest
Hanmer Forest	32.6	2nd	1906	Highest
April				
South West Cape	21.3	5th	1991	Highest
May				
Puysegur Point	20.9	1st	1978	Highest
June				
Whakatāne	20.9	2nd	1975	Highest
Motu	19.6	2nd	1990	Highest
Port Taharoa	20.5	22nd	1973	Highest
Porirua	19.4	27th	1968	Highest
Farewell Spit	19.4	2nd	1971	Highest
Puysegur Point	17.7	14th	1978	Highest
Akaroa	23.0	16th	1978	Equal highest
July				
Te Kuiti	19.3	19th	1959	Highest
New Plymouth	18.2	20th	1944	Highest
Porirua	17.6	20th	1968	Highest
Stratford	18.3	19th	1960	Highest
Arapito	19.0	18th	1978	Equal highest
South West Cape	16.0	29th	1991	Equal highest
August				
Gisborne	23.0	31st	1905	Highest

Hastings	22.9	30th	1965	Highest
Takaka	20.8	30th	1978	Highest
Farewell Spit	19.4	29th	1971	Highest
Blenheim	23.8	31st	1932	Highest
Lincoln	22.3	30th	1881	Highest
Le Bons Bay	20.4	30th	1984	Highest
Orari Estate	23.8	30th	1972	Highest
Timaru	25.1	30th	1885	Highest
Waimate	23.4	30th	1908	Highest
Oamaru	23.2	30th	1967	Highest
September				
Tiri Tiri Lighthouse	20.7	25th	1982	Highest
Cheviot	25.2	23rd	1982	Highest
Le Bons Bay	24.1	17th	1984	Highest
October				
Cape Reinga	22.3	27th	1951	Highest
Leigh	24.8	24th	1966	Highest
Whitianga	26.7	27th	1962	Highest
Rotorua	24.2	5th	1964	Highest
Taupō	27.6	5th	1949	Highest
Te Kuiti	26.5	5th	1959	Highest
Tūrangi	26.6	5th	1968	Highest
Waipawa	27.8	5th	1945	Highest
Wairoa	30.8	5th	1964	Highest
Hāwera	22.9	25th	1977	Highest
Ohakune	25.0	5th	1962	Highest
Balclutha	27.5	4th	1964	Highest
Whangārei	25.6	31st	1967	Equal highest
Whatawhata	23.5	25th	1952	Equal highest
November				
None observed				
December				
None observed				

Table 8: Extremes of low daily maximum temperature in 2020 were recorded at:

Location	Extreme low maximum (°C)	Date of extreme temperature	Year records began	Ranking
January				
Whitianga	17.6	14th	1971	Lowest
February				
None observed				
March				
Porirua	13.6	28th	1972	Lowest
April				
Secretary Island	8.5	13th	1989	Lowest

May				
None observed				
June				
None observed				
July				
Tiwai Point	2.3	17th	1972	Lowest
August				
None observed				
September				
Secretary Island	6.0	28th	1989	Lowest
Puysegur Point	6.2	28th	1978	Lowest
Dunedin (Airport)	5.2	29th	1972	Lowest
Manapouri (West Arm Jetty)	1.9	28th	1972	Lowest
Alexandra	4.6	29th	1930	Lowest
Clyde	5.7	29th	1978	Equal lowest
October				
None observed				
November				
None observed				
December				
Secretary Island	11.1	11th	1989	Lowest

Table 9: Extremes of low daily minimum temperature in 2020 were recorded at:

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Ranking
January				
None observed				
February				
None observed				
March				
Christchurch (Airport)	-1.3	18th	1863	Lowest
Le Bons Bay	3.5	24th	1984	Lowest
Clyde	-1.6	29th	1978	Lowest
April				
None observed				
May				
Tūrangi	-5.6	22nd	1968	Lowest
Ohakune	-6.7	22nd	1962	Lowest
June				
Clyde	-9.9	14th	1978	Lowest
July				
None observed				
August				
None observed				

September				
Le Bons Bay	-0.9	18th	1984	Lowest
Orari Estate	-4.0	4th	1972	Lowest
Nugget Point	-1.4	30th	1970	Lowest
Tautuku	-3.0	2nd	1976	Lowest
Puysegur Point	1.1	29th	1978	Equal lowest
Christchurch	-4.8	30th	1863	Equal lowest
October				
Timaru (Airport)	-4.5	16th	1885	Lowest
Balclutha	-4.5	10th	1964	Lowest
November				
None observed				
December				
None observed				

Table 10: Extremes of high daily minimum temperature in 2020 were recorded at:

Location	Extreme high minimum (°C)	Date of extreme temperature	Year records began	Ranking
January				
Upper Hutt (Trentham)	20.0	27th	1972	Highest
Arthur's Pass	16.3	27th	1978	Highest
February				
Masterton	22.2	4th	1943	Highest
Upper Hutt (Trentham)	21.4	4th	1972	Highest
Appleby	20.5	2nd	1941	Highest
Blenheim	22.0	4th	1947	Highest
Waiau	24.4	3rd	1974	Highest
Cheviot	24.5	3rd	1982	Highest
Rangiora	22.1	3rd	1972	Highest
Akaroa	23.8	3rd	1978	Highest
Le Bons Bay	21.5	3rd	1984	Highest
Lake Tekapo	21.5	3rd	1928	Highest
Milford Sound	18.2	3rd	1935	Equal highest
Wānaka	20.3	3rd	1972	Equal highest
March				
Whangaparāoa	20.1	4th	1982	Highest
April				
Te Anau	16.1	6th	1973	Highest
May				
Puysegur Point	16.7	2nd	1978	Highest
South West Cape	14.7	2nd	1991	Highest
June				
Puysegur Point	13.3	16th	1978	Highest

South West Cape	12.2	16th	1991	Highest
July				
Roxburgh	9.9	31st	1950	Equal highest
August				
Milford Sound	11.6	2nd	1935	Highest
Secretary Island	13.6	1st	1988	Highest
Brothers Island	12.8	30th	1997	Highest
Cheviot	11.8	30th	1982	Highest
Mt Cook (Airport)	10.0	31st	1929	Highest
Tara Hills	9.7	30th	1949	Highest
Wānaka	10.8	31st	1972	Highest
Te Anau	10.7	31st	1973	Highest
Lumsden	12.6	31st	1982	Highest
Porirua	12.5	21st	1972	Equal highest
September				
Hastings	16.0	27th	1972	Highest
Waiouru	10.7	24th	1972	Highest
Grassmere Salt Works	15.9	24th	1972	Highest
Le Bons Bay	15.4	23rd	1984	Highest
Cape Reinga	14.8	27th	1971	Equal highest
October				
Cape Reinga	16.0	31st	1971	Highest
New Plymouth	16.2	31st	1944	Highest
Martinborough	17.0	25th	1986	Highest
Paraparaumu	15.6	31st	1972	Highest
Porirua	15.4	31st	1972	Highest
Wellington (Airport)	16.5	31st	1972	Highest
Upper Hutt (Trentham)	16.1	31st	1972	Highest
Arapito	14.9	26th	1978	Highest
Reefton	15.0	26th	1972	Highest
Greymouth	14.4	31st	1972	Highest
Puysegur Point	15.2	25th	1978	Highest
Motueka	15.8	27th	1972	Highest
Blenheim	17.3	26th	1947	Highest
Arthur's Pass	11.6	26th	1973	Highest
Manapouri (West Arm Jetty)	12.2	31st	1972	Highest
Roxburgh	17.8	4th	1950	Highest
Hāwera	15.3	31st	1977	Equal highest
Franz Josef	13.4	26th	1953	Equal highest
November				
None observed				
December				
Takapau Plains	18.7	8th	1972	Highest

Strong winds

On 15 April, a deep low centred east of the South Island generated strong southerly winds and large swells. Coastal parts of Wellington were inundated by large waves, measured to be at least 5.5 m high by a NIWA buoy near Baring Head. The large waves deposited debris over coastal roads and caused damage to private property, including garage doors and walls. The occupants of five properties were forced to evacuate. One person was swept out to sea, but was rescued shortly thereafter suffering moderate injuries.

During the night of 3-4 October, strong westerly winds fanned fires near Lake Ōhau Alpine Village in Canterbury. The 5360 hectare Lake Ōhau fire destroyed about 50 homes and at least 300 livestock were killed. Although there are no formal weather stations operating at Lake Ōhau Alpine Village, residents reported being kept awake by the roaring strength of the winds prior to the fire's arrival.

On 21 November strong winds affected Otago and Southland and led to downed trees, roofs lifting and widespread power outages. A Fire and Emergency New Zealand spokesman said it was called to 33 wind-related callouts in Southland and Otago. The strong winds on Otago Peninsula contributed to a fire in Portobello. Twenty-eight residents from 14 houses were evacuated to Portobello's Coronation Hall.

Table 11. Maximum wind gust extremes in 2020 were recorded at:

Location	Maximum wind gust (km/h)	Date of maximum wind gust	Year records began	Ranking
January				
Secretary Island	161	11th	1994	Highest
Oamaru	106	30th	1984	Highest
Gore	130	30th	1987	Highest
February				
Secretary Island	165	16th	1994	Highest
March				
Oamaru	100	23rd	1984	Highest
April				
Clyde	95	12th	1983	Equal highest
May				
Hāwera	111	3rd	1986	Highest
June				
Secretary Island	133	15th	1994	Highest
July				
None observed				
August				
Gore	107	31st	1987	Equal highest
South West Cape	169	31st	1991	Equal highest
September				
Upper Hutt (Trentham)	98	28th	1999	Highest
Hāwera	104	29th	1986	Highest
Westport	120	15th	1973	Highest

Secretary Island	156	26th	1994	Highest
Palmerston North	96	15th	1991	Equal highest
October				
None observed				
November				
None observed				
December				
Hāwera	96	1st	1986	Highest
Secretary Island	143	2nd	1994	Equal highest

Snow and ice

August 2020 was notable for a relative lack of snow in many of New Zealand's mountain areas. Towards the end of August, snow depths were approximately half of usual for the time of year at several NIWA Snow and Ice Monitoring sites, including Mt Philistine (Arthur's Pass National Park), Mueller Hut (Aoraki/ Mount Cook National Park) and Castle Mount (Fiordland National Park). Several ski areas were impacted by the lack of snow, including Temple Basin (Arthur's Pass) which announced it wouldn't open at all for the season.

From 28-29 September, snow settled to sea level in Otago, Southland and Stewart Island. It was the most widespread low-elevation snowfall of the year, with polar air drawn from Antarctica by a deep low pressure system in the Southern Ocean. There were widespread road closures in Southland and Otago, and snow also caused the closure of SH6 between Fox Glacier/Te Moeka o Tuawe and Franz Josef Glacier/Kā Roimata o Hine Hukatere. Approximately 50 cars and trucks were stranded on SH1 north of Balclutha due to blizzard conditions, with police and council contractors called in to move the vehicles safely. Flights at Invercargill, Dunedin and Queenstown Airports were disrupted by snow on their runways and poor visibility. *The Remarkables* ski area reported up to 60 cm of fresh snow. Snow also fell to low elevations in Nelson and Tasman, with several road closures including SH63 from Kawatiri to St Arnaud and Canaan Road (Takaka Hill).

Tornadoes and waterspouts

On 26 June, three separate small tornadoes were reported in Northland. In Whangārei, six boats were blown off their cradles in the *Norsand Boatyard*. In Mata (south of Whangārei), trees were toppled and iron from a farm shed strewn among a nearby stand of trees. Farther north in Ōakura, trees were also toppled by a tornado. A tornado also struck Dairy Flat (north of Auckland), with one house suffering considerable damage including having the roof torn off. Nearby areas saw mature trees torn down with reports of miscellaneous property damage.

On 27 June, tornadoes were reported in Auckland and Papamoa. Multiple buildings and roofs were damaged in East Tamaki (south Auckland) and trees were brought down. In Papamoa a local reported seeing roof tiles, gutters and television dishes ripped off houses.

On 20 August, a tornado was reported in Pukenui (Northland). A launch was blown off its blocks, and one house lost half of its roof. Additional damage was reported to include trees, a large shed and a trampoline was sent tumbling along the road.

Cloud and fog

Significant smoke and haze from Australian bushfires affected New Zealand for several days starting 1 January. This peaked in the North Island on 5 January before a southerly change pushed the particulates northward on 6 January. The smoke and dust associated with this event deposited a layer of particulate over parts of the Southern Alps, causing a discolouration of the snow.



Australian bushfire smoke as viewed looking beyond Lake Wakatipu to the Remarkables mountain range in Queenstown on 1 January 2020. Picture taken around 9 a.m. Picture credit – Gregor Macara



Upper reaches of the Tasman Glacier on 5 March 2020, with particulates deposited from the Australian Bushfires causing discolouration of the snow. Picture credit – Gregor Macara

Lightning and hail

On 6 September, a late-afternoon southerly change generated several thunderstorms over parts of Canterbury, especially towards the eastern foothills. Heavy hail was reported in the town of Oxford, which blanketed the ground white. Fire and Emergency responded to several calls in Oxford where household roofs were leaking. At least 900 lightning strikes were recorded over the area between Methven and Amberley.

On 26 December, thunderstorms and hail brought widespread damage to the Tasman region. The hail caused power outages, shredded vineyards, smashed greenhouses, dented and bruised apples, kiwifruit and hops and severely damaged buildings in Motueka. The cost of the damage was thought to be in the tens of millions of dollars.

For climate data or media comment, please contact:

Mr Gregor Macara

Climate Scientist, NIWA National Climate Centre

Tel. 04 386 0509

Note for editors:

Climate measurements have been made in New Zealand for about 150 years, with reasonable coverage of reliable data from at least the early 1900s. NIWA makes its raw climate data publicly available for free online. Journalists are advised, however, to take extreme care when interpreting trends from raw data to ensure they have not been compromised by changes in site location, urbanisation, exposure, or instrumentation over time. If in any doubt, please call us.

© Copyright NIWA 2021. All rights reserved

Acknowledgement of NIWA as the source of this information and all forms of media associated with it is required.