

## New Zealand's 4<sup>th</sup>-warmest July on record

<b>Temperature</b>	Well above average (>1.20°C above average) or above average (0.51-1.20°C above average) temperatures were observed for most of the country. Pockets of near average temperatures ( $\pm 0.50^\circ\text{C}$ of average) were observed in isolated parts of North Canterbury, Wellington, Gisborne, and northern Northland.
<b>Rainfall</b>	Above normal (120-149% of normal) or well above normal (>149% of normal) rainfall was observed in eastern and southern parts of the South Island. Rainfall was below normal rainfall (50-79% of normal) or well below normal (<50% of normal) for inland, western, and northern parts of the South Island, and much of the North Island.
<b>Soil Moisture</b>	At the end of the month, soil moisture levels were near normal for most of the country. Above normal soil moisture was observed in eastern parts of Otago, and coastal parts of southern Marlborough. Below normal soil moisture was observed in parts of the Mackenzie Basin.

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### Overview

July 2023 mean sea level air pressure was lower than normal near and over Aotearoa New Zealand, and higher than normal to the northwest of the country. This was associated with more southwesterly winds than normal. Sea surface temperatures near New Zealand remained higher than average, with marine heatwave conditions persisting in coastal waters near the South Island and lower North Island.

It was a relatively warm July throughout New Zealand, with well above average (>1.20°C above average) or above average (0.51-1.20°C above average) temperatures observed for most areas. Pockets of near average temperatures ( $\pm 0.50^\circ\text{C}$  of average) were observed in parts of North Canterbury, Wellington, Gisborne, and northern Northland. Overall, the nationwide average temperature in July 2023 was 9.1°C. This was 1.1°C above the 1991-2020 July average, making it New Zealand's 4<sup>th</sup>-warmest July since NIWA's seven station temperature series began in 1909. Globally, July was an exceptionally hot month. The Copernicus Climate Change Service and World Meteorological Organization announced that the first three weeks of July 2023 were the warmest three-week period on record, and that it was "extremely likely" that July 2023 would be the hottest month on record<sup>1</sup>.

<sup>1</sup> <https://public.wmo.int/en/media/press-release/july-2023-set-be-hottest-month-record>

July was a wet month for eastern and southern parts of the South Island. Rainfall was above normal (120-149% of normal) or well above normal (>149% of normal) in eastern parts of Canterbury and Otago, and southern parts of Southland. For much of the remainder of the country, it was a relatively dry month. Rainfall was below normal rainfall (50-79% of normal) or well below normal (<50% of normal) for northern Fiordland, inland Otago, much of the West Coast, Nelson, Marlborough and Tasman, western and inland parts of the North Island from Wellington to southern Auckland, southern Hawke’s Bay, Bay of Plenty, and eastern Northland. Rainfall was near normal (80-119% of normal) about the northwestern tip of the North Island, eastern Gisborne, the Tararua District, Wairarapa, and the northern West Coast.

**Further Highlights:**

- The highest temperature was 21.1°C, observed at Wairoa on 18 July.
- The lowest temperature was -9.1°C, observed at Cass (inland Canterbury) on 7 July.
- The highest 1-day rainfall was 199 mm, recorded at Akaroa on 22 July.
- The highest wind gust was 180 km/h, observed at Cape Turnagain on 1 and again on 16 July.
- Of the six main centres in July 2023, Auckland was the warmest, Christchurch was the coolest and wettest, Hamilton was the driest, Tauranga was the sunniest and Dunedin was the least sunny.
- Of the available, regularly reporting sunshine observation sites, the sunniest four regions in 2023 so far are Mackenzie Basin (1433 hours), Taranaki (1403 hours), wider Nelson (1403 hours) and Tasman (1369 hours).

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**Temperature: A warm July for most areas of the country**

The warmest towns compared to average were Taupō, Mt Cook Village, Lake Tekapo, and Alexandra, where mean temperatures were at least 2°C higher than average for the time of year. Notably, it was the warmest July on record in Dunedin and Waipounamu (Southland, northwest of Gore). A total of 37 (26) locations observed record or near-record high mean maximum (minimum) temperatures.

**Record<sup>2</sup> or near-record mean air temperatures for July were recorded at:**

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Dunedin (Musselburgh)	8.5	1.8	1947	Highest

<sup>2</sup> 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.

Waipounamu	5.7	1.8	1980	Highest
Taupō	9.2	2.4	1949	2nd-highest
Motueka	8.8	1.7	1956	2nd-highest
Waimate	7.7	1.9	1908	2nd-highest
Five Rivers	6.0	1.9	1982	2nd-highest
Cromwell	5.8	1.9	1949	2nd-highest
Alexandra	5.6	2.3	1929	2nd-highest
Balclutha	6.6	1.6	1964	2nd-highest
Auckland (Whenuapai)	11.8	1.3	1945	3rd-highest
Hamilton (Ruakura)	10.8	1.8	1906	3rd-highest
Hāwera	10.5	1.8	1977	3rd-highest
Lake Tekapo	4.2	2.3	1927	3rd-highest
Pukaki Aerodrome	3.6	1.8	1972	3rd-highest
Windsor	7.0	1.8	2000	3rd-highest
Oamaru	7.9	1.4	1967	3rd-highest
Gore	6.6	1.8	1907	3rd-highest
Oban (Stewart Island)	7.7	1.2	1975	3rd-highest
Nugget Point	7.5	1.2	1970	3rd-highest
Whitianga	12.1	1.5	1962	4th-highest
Waipawa	8.6	1.0	1945	4th-highest
Wairoa	10.5	1.0	1964	4th-highest
Whanganui	11.2	1.5	1937	4th-highest
Greymouth	9.4	1.4	1947	4th-highest
Mt Cook Village	4.5	2.0	1929	4th-highest
Rangiora	7.2	1.1	1965	4th-highest
Le Bons Bay	8.6	1.0	1984	4th-highest
Orari	6.5	0.9	1972	4th-highest
Tara Hills	4.1	1.7	1949	4th-highest
Middlemarch	5.7	1.9	2000	4th-highest
Queenstown	5.9	1.9	1871	4th-highest
Lauder	4.6	1.9	1924	4th-highest
Roxburgh	6.9	1.4	1950	4th-highest
Invercargill	7.0	1.5	1905	4th-highest
Tiwai Point	7.7	1.3	1970	4th-highest
Tautuku	7.6	1.2	1976	4th-highest
Chatham Island	9.6	1.2	1878	4th-highest
<b>Low records or near-records</b>				
None observed				

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Whakatu	16.3	2.5	1965	Highest
Westport	14.5	1.6	1937	Highest
Appleby	14.7	1.6	1932	Highest
Lake Tekapo	9.5	2.9	1927	Highest
Taupō	13.5	2.4	1949	2nd-highest

Motu	12.4	1.8	1990	2nd-highest
Napier	15.9	1.8	1870	2nd-highest
Paraparaumu	14.4	1.6	1953	2nd-highest
Tākaka	15.0	1.6	1978	2nd-highest
Brothers Island	13.3	1.3	1997	2nd-highest
Mt Cook Airport	9.6	2.5	1929	2nd-highest
Pukaki Aerodrome	10.2	3.0	1972	2nd-highest
Tara Hills	10.2	2.7	1949	2nd-highest
Windsor	13.0	1.9	2000	2nd-highest
Waipounamu	10.5	1.9	1980	2nd-highest
Purerua	16.6	1.2	1983	3rd-highest
Kawerau	15.8	1.0	1954	3rd-highest
Wairoa	16.1	1.9	1964	3rd-highest
Greymouth	13.4	1.6	1947	3rd-highest
Franz Josef	13.0	1.2	1953	3rd-highest
Motueka	15.2	2.2	1956	3rd-highest
Wānaka	10.4	2.3	1955	3rd-highest
Cromwell	11.6	2.5	1949	3rd-highest
Clyde	11.4	2.2	1978	3rd-highest
Alexandra	11.5	2.7	1929	3rd-highest
Whakatāne	16.1	1.2	1974	4th-highest
Taumarunui	13.8	1.6	1947	4th-highest
Masterton	14.4	1.5	1906	4th-highest
Waipawa	14.2	1.6	1945	4th-highest
Blenheim	14.5	1.2	1932	4th-highest
Middlemarch	11.3	1.8	2000	4th-highest
Dunedin (Musselburgh)	11.6	1.2	1947	4th-highest
Oamaru	12.1	2.0	1967	4th-highest
Manapouri (West Arm Jetty)	7.7	1.7	1971	4th-highest
Queenstown	10.2	1.6	1871	4th-highest
Five Rivers	10.6	1.8	1982	4th-highest
Invercargill	11.0	1.1	1905	Equal 4th-highest
<b>Low records or near-records</b>				
Mt Ruapehu Chateau	6.2	-0.7	2000	3rd-lowest

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

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Hāwera	7.6	2.5	1977	Highest
Dunedin (Musselburgh)	5.4	2.4	1947	Highest
Waipounamu	0.9	1.7	1980	Highest
Auckland (Whenuapai)	8.3	2.1	1945	2nd-highest
Mt Cook Village	0.0	2.2	1929	2nd-highest
Windsor	1.0	1.8	2000	2nd-highest
Oamaru	3.8	1.8	1967	2nd-highest
Middlemarch	0.0	1.8	2000	2nd-highest
Five Rivers	1.4	2.0	1982	2nd-highest

Gore	2.8	1.8	1907	2nd-highest
Tiwai Point	4.5	1.6	1970	2nd-highest
Tautuku	4.3	1.7	1976	2nd-highest
Dargaville	10.0	1.8	1943	3rd-highest
Taupō	4.9	2.4	1949	3rd-highest
Akaroa	5.4	0.7	1978	3rd-highest
Alexandra	-0.2	2.0	1929	3rd-highest
Invercargill	3.1	1.9	1905	3rd-highest
Oban (Stewart Island)	4.6	1.8	1975	3rd-highest
Nugget Point	5.1	1.5	1970	3rd-highest
Kaitaia	10.3	1.8	1948	4th-highest
Whangārei	9.4	1.3	1967	4th-highest
Auckland (Western Springs)	8.7	1.6	1948	4th-highest
Whitianga	8.2	2.2	1962	4th-highest
Stratford	5.6	1.5	1960	4th-highest
Ohakune	3.4	1.8	1962	4th-highest
Whanganui	8.0	1.9	1937	4th-highest
<b>Low records or near-records</b>				
None observed				

## Rainfall: Wet for eastern and southern South Island, otherwise mostly dry

Near-record high rainfall totals were observed in parts of eastern Canterbury, and Southland. It was an exceptionally wet month in Akaroa which received 400 mm of rainfall, which was 332% of normal for July. Almost half of this rainfall, 199 mm, was recorded on 22 July. In contrast, it was a relatively dry month for most remaining areas of the country. Three locations observed near-record low July rainfall totals. Tākaka recorded just 48 mm of rainfall, and the lack of rain was accompanied by 205 hours of sunshine for the month – its highest sunshine hour total for July since records began in 1985.

### Record or near-record July rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
<b>High records or near-records</b>				
Campbell Island	199	173	1992	Highest
Cheviot	202	303	1982	3rd-highest
Akaroa	400	332	1977	3rd-highest
Le Bons Bay	203	303	1984	3rd-highest
Māhia	211	147	1990	4th-highest
Gore	131	222	1907	4th-highest
Tautuku	194	199	1976	4th-highest
<b>Low records or near-records</b>				
Stratford	58	29	1960	4th-lowest
Tākaka	48	27	1976	4th-lowest
Ōkārito	100	46	1981	4th-lowest

## July climate in the six main centres

It was warm month for all the main centres, especially in Dunedin which measured its warmest July on record. Rainfall was mostly below or well below normal in the main centres, except for Christchurch and Dunedin which received 241% and 153% of normal July rainfall, respectively. Of the six main centres in July 2023, Auckland was the warmest, Christchurch was the coolest and wettest, Hamilton was the driest, Tauranga was the sunniest and Dunedin was the least sunny.

### July 2023 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland <sup>a</sup>	12.4	+1.3	Well above average
Tauranga <sup>b</sup>	11.9	+1.4	Well above average
Hamilton <sup>c</sup>	10.1	+1.2	Above average
Wellington <sup>d</sup>	9.6	+0.4	Near average
Christchurch <sup>e</sup>	6.6	+0.6	Above average
Dunedin <sup>f</sup>	8.5	+1.8	Above average – highest on record
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland <sup>a</sup>	104	75	Below normal
Tauranga <sup>b</sup>	79 <sup>3</sup>	59	Below normal
Hamilton <sup>c</sup>	47	34	Well below normal
Wellington <sup>d</sup>	114	77	Below normal
Christchurch <sup>e</sup>	155	241	Well above normal
Dunedin <sup>f</sup>	79	153	Well above normal
Sunshine			
Location	Sunshine (hours)		
Auckland <sup>a</sup>	137		
Tauranga <sup>b</sup>	154 <sup>4</sup>		
Hamilton <sup>g</sup>	129		
Wellington <sup>d</sup>	126 <sup>3</sup>		
Christchurch <sup>e</sup>	150		
Dunedin <sup>f</sup>	93		

<sup>a</sup> Māngere <sup>b</sup> Tauranga Airport <sup>c</sup> Hamilton Airport <sup>d</sup> Kelburn <sup>e</sup> Christchurch Airport <sup>f</sup> Musselburgh <sup>g</sup> Ruakura

<sup>3</sup> Missing 5 days of data.

<sup>4</sup> Missing 1 day of data.

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## Highlights and extreme events

### Temperatures

On 18 and 24 July, a warm northerly airflow over New Zealand contributed to high daily maximum and minimum temperatures in many areas.

The highest temperature was 21.1°C, observed at Wairoa on 18 July. The lowest temperature was -9.1°C, observed at Cass (inland Canterbury) on 7 July.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
<b>High records or near-records</b>				
Greymouth	18.4	24th	1947	Highest
Blenheim	19.8	18th	1932	Highest
Brothers Island	18.4	4th	1997	Highest
Middlemarch	18.4	18th	2000	Highest
Waipounamu	17.9	31st	1980	Highest
Cromwell	18.7	18th	1949	Highest
Clyde	19.0	18th	1978	Equal highest
Oban (Stewart Island)	16.0	15th	1975	Equal highest
Franz Josef	18.8	24th	1953	2nd-highest
Le Bons Bay	18.3	18th	1984	2nd-highest
Pukaki Aerodrome	17.9	18th	1972	2nd-highest
Tara Hills	16.5	14th	1949	2nd-highest
Balclutha	18.2	31st	1964	2nd-highest
Ngawi	18.8	14th	1972	Equal 2nd-highest
Purerua	18.6	15th	1983	3rd-highest
Haast	18.4	24th	1949	3rd-highest
Motueka	19.1	14th	1956	3rd-highest
Lake Tekapo	16.0	18th	1925	3rd-highest
Alexandra	19.3	18th	1928	3rd-highest
Tautuku	17.1	31st	1976	3rd-highest
Motu	16.5	15th	1990	Equal 3rd-highest
Akaroa	21.0	18th	1978	Equal 3rd-highest
Chatham Island	16.1	20th	1878	Equal 3rd-highest
Lauder	17.2	18th	1924	4th-highest
Nugget Point	16.5	31st	1970	4th-highest
Windsor	18.9	18th	2000	Equal 4th-highest
<b>Low records or near-records</b>				
Oban (Stewart Island)	4.5	1st	1975	2nd-lowest
Ōkārito	7.8	1st	1983	4th-lowest



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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
<b>High records or near-records</b>				
Haast	12.9	24th	1949	Highest
Orari	8.6	24th	1972	Highest
Waipounamu	10.9	18th	1980	Highest
Wānaka	9.2	19th	1972	Equal highest
Hāwera	12.6	15th	1977	2nd-highest
Mt Cook Airport	9.2	18th	1929	2nd-highest
Oamaru	10.4	24th	1972	2nd-highest
Gore	9.6	18th	1907	2nd-highest
Balclutha	8.6	18th	1972	2nd-highest
Campbell Island	8.7	10th	1991	2nd-highest
Port Taharoa	14.2	16th	1974	3rd-highest
Timaru	8.9	24th	1885	3rd-highest
Waimate	9.5	24th	1908	3rd-highest
Oban (Stewart Island)	10.6	18th	1975	3rd-highest
Windsor	7.5	24th	2000	Equal 3rd-highest
Five Rivers	9.8	18th	1982	4th-highest
Nugget Point	8.8	18th	1972	4th-highest
Tautuku	9.2	18th	1976	4th-highest
Rangiora	10.0	24th	1972	Equal 4th-highest
Queenstown	7.8	18th	1871	Equal 4th-highest
<b>Low records or near-records</b>				
None observed				

**Rain and slips**

On 1 July, a slip blocked both lanes of SH88 between Ravensbourne and Roseneath (Dunedin), limiting access to Port Chalmers.

On 5 July, a family living in Maungatapu (Tauranga) were evacuated from their home after a slip affected their property.

On 10 July, a three-kilometre section of SH12 between Pakanae Cemetery Road and Fairlie Crescent (Far North District) was closed due to a slip.

On 21 July, heavy rain caused flooding and slips in parts of Auckland, Coromandel, and Gisborne. Several train services in Auckland were disrupted after a landslip on a section of track between Parnell and Newmarket Stations. On Waiheke Island, a slip blocked the main road, causing delays to bus services there. On the Coromandel, SH25 was closed by slips between Manaia and Te Kouma, and near Ruamahunga. In Thames, emergency services were called in to help pull a vehicle out of floodwaters on Kauaeranga Valley Road.

From 23-24 July, persistent heavy rain caused flooding in eastern parts of Canterbury. The SH1 bridge over the Ashburton River was closed due to build-up of flood debris, with a number of other roads



around the region closed due to surface flooding. A man was rescued from the roof of his vehicle after being trapped in Hawkins River floodwaters.

The highest 1-day rainfall was 199 mm, recorded at Akaroa on 22 July.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Christchurch	86	22nd	1873	Highest
Akaroa	199	22nd	1977	Highest
Gore	35	2nd	1907	Highest
Campbell Island	39	9th	1991	Highest
Winchmore	76	22nd	1947	2nd-highest
Ashburton	74	22nd	1927	2nd-highest
Rangiora	94	22nd	1965	2nd-highest
Lincoln	66	22nd	1881	2nd-highest
Le Bons Bay	60	22nd	1984	2nd-highest
Māhia	53	8th	1990	3rd-highest
Hanmer Forest	119	23rd	1905	3rd-highest
Orari	75	22nd	1897	3rd-highest
Waipounamu	36	2nd	1917	3rd-highest
Waiau	45	22nd	1974	4th-highest
Roxburgh	21	2nd	1950	4th-highest

**Wind**

On 4 July, localised intense winds caused damage to several properties in Clyde, with part of the roof torn off one house.

On 21 July, strong winds caused brought trees down on to power lines in Kāpiti, Horowhenua and Manawatū, causing power outages for approximately 10,000 customers. Power lines were blown down in Shannon, and both SH57 and SH57 in the Manawatū were closed after trucks were blown onto their side. At Kāpiti Airport, a small two-seater plane was flipped upside down. Farther north, several lanes of the Auckland Harbour Bridge were closed due to gusty winds.

On 26 July, strong and gusty winds reduced the Auckland Harbour Bridge down to two lanes. *Bluebridge* ferry crossings between the North and South Islands were cancelled due to strong southerly winds and high swells in the Cook Strait.

On 27 July, strong winds in Invercargill brought down trees around the city, including at Queens Park, and Scott Road. A trampoline was blow on to Racecourse Road.

The highest wind gust recorded was 180 km/h, observed at Cape Turnagain on 1 and 16 July.

**Record or near-record July extreme wind gusts were recorded at:**

Location	Extreme wind gust (km/h)	Date of extreme gust	Year records began	Comments
Secretary Island	145	1st	1994	2nd-highest
Oamaru	89	4th	1984	2nd-highest

Whitianga	85	3rd	1991	3rd-highest
Lincoln	89	1st	1999	3rd-highest
Tiwai Point	119	27th	1971	3rd-highest
Kaikohe	96	3rd	1986	Equal 3rd-highest
Taupō	89	21st	1982	Equal 3rd-highest
Hamilton (Airport)	85	3rd	1978	Equal 3rd-highest
Alexandra	82	5th	2001	Equal 3rd-highest

### Snow and ice

From 2-3 July, snow fell to near sea level in parts of Southland and Otago. Several roads were closed due to snow including SH87 from Kyeburn to Outram, SH93 from Clinton to Mataura and SH94 from Te Anau to Milford Sound. Vehicles on the Manuka Gorge Highway (SH8) in Otago were temporarily stuck due to snow. Farther north, snow affected the Desert Road (SH1) and it was temporarily closed due to icy conditions. From 29 June to 4 July, the *Remarkables* ski area reported 67 cm of new snow. Considerably less fresh snow was reported at nearby *Coronet Peak* and *Cardrona* ski areas during this period as the bulk of the precipitation from this cold southwesterly outbreak didn't travel far enough inland.

On 23 July, snowfall closed several inland South Island roads including SH8 (Twizel to Fairlie), SH80 (Aoraki Mt Cook Highway), SH73 (Porters and Arthur's passes), and SH7 (Lewis Pass). Approximately 70 cm of fresh snow was reported at the base areas of Roundhill Ski Area (near Lake Tekapo) and Mt Hutt ski area (near Methven), respectively.

On 26 July and 28 July, the Desert Road (SH1) was closed between Rangipo and Waiouru due to snow.

### Lightning, hail, and tornadoes

On 26 July, showery weather and areas of thunderstorms occurred across many northern and southern parts of New Zealand. Hail was reported in Riverhead, Auckland. Farther south, two waterspouts were spotted off the coast of Taranaki between Manaia and Opunake.

### Cloud and fog

On 24 July, thick fog at Auckland Airport resulted in the cancellation of 31 domestic flights.

On 31 July, 10 flights were cancelled at Auckland Airport due to fog.

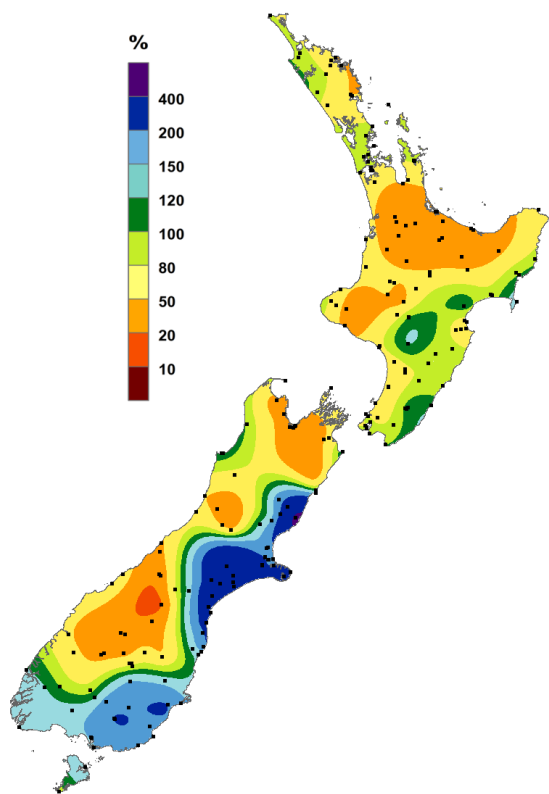
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**For further information, please contact:**

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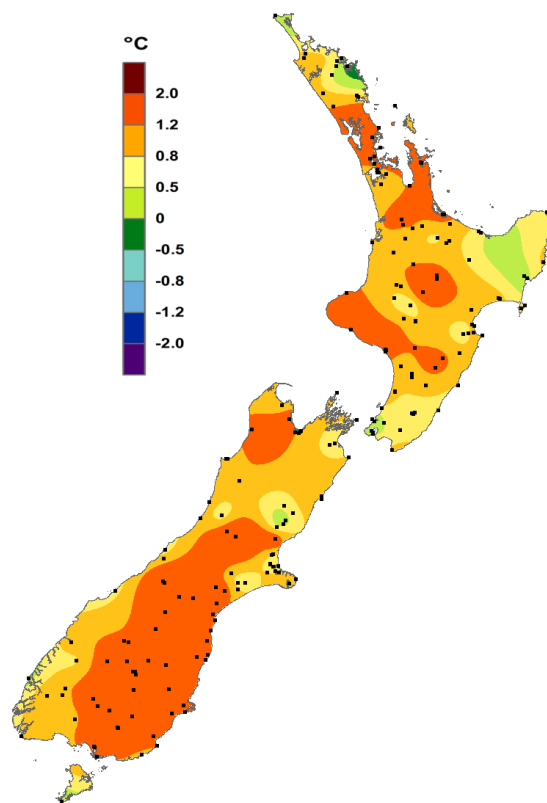
Climate Scientist, NIWA Wellington

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**July rainfall**

Expressed as a percentage of the 1991-2020 normal.



**July 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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