

## Heavy rain, flooding, and New Zealand's 2<sup>nd</sup>-warmest August

Temperature	It was New Zealand's 2 <sup>nd</sup> -warmest August on record, with the nationwide average temperature 1.5°C above average. Well above average (>1.20°C above average) temperatures were observed in a majority of the North Island and the central South Island, and many locations experienced a record or near-record warm August. Above average temperatures (0.51-1.20°C above average) were observed in parts of Bay of Plenty, western Waikato, coastal South Canterbury, eastern Otago, and much of Southland. Isolated pockets of near average temperatures ( $\pm 0.50^\circ\text{C}$ of average) were observed in Tasman and Southland.
Rainfall	Rainfall varied greatly in August, with some areas experiencing record-setting rainfall and flooding, while other locations were quite dry. Well above normal (>149% of normal) or above normal (120-149% of normal) rainfall was observed in northern Northland, parts of Auckland, western Waikato and Taranaki, southern Hawke's Bay, southern Manawatū-Whanganui to western Wellington, Tasman, Nelson, Marlborough, the West Coast, interior Canterbury, and northern Otago. Conversely, below normal rainfall (50-79% of normal) was observed in southern Northland, northern Waikato and the Coromandel, parts of Bay of Plenty and Gisborne, interior Manawatū-Whanganui, much of coastal Canterbury, southern Otago and eastern Southland. Pockets of well below normal rainfall (<50% of normal) occurred in eastern Bay of Plenty, Banks Peninsula, and near Dunedin. Elsewhere, near normal rainfall (80-119% of normal) was observed.
Soil Moisture	At the end of August, soil moisture levels were near normal for a majority of the country. Above normal soil moisture was observed in eastern Marlborough, coastal South Canterbury, and interior Otago.

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### Overview

August 2022 was notable for extreme rainfall and flooding, and being Aotearoa New Zealand's 2<sup>nd</sup>-warmest August on record. This was driven by the combined effect of La Niña conditions and a negative Indian Ocean Dipole, marked by warmer than average seas in the tropical eastern Indian Ocean near Sumatra and cooler seas in the western Indian Ocean near Africa, warm coastal sea temperatures and marine heatwave conditions in the New Zealand region, and a pulse of the Madden-Julian Oscillation in the Australasia region (an area of enhanced rain and cloud in the tropics). The

resultant circulation pattern favoured a persistent blocking high pressure system to the east of the country and more northeasterly winds than normal.

The most impactful event was the mid-month atmospheric river and flooding event which occurred from 16-20 August. An incredibly moisture-rich plume of air from the tropics sat over parts of the country for five days, bringing extreme rainfall to places such as Nelson, Tasman, western Marlborough, Wellington, Taranaki, and parts of Northland. An analysis by NIWA indicated it was the strongest August atmospheric river on record since at least 1959, resulting in a 1-in-120 year rain event in Nelson. Nelson experienced severe flooding as the Maitai River burst its banks, and the river's flow reached a maximum of 459 cumecs on 17 August, nearly double its previous record flow of 237 cumecs in December 2011. Numerous road closures occurred in the top of the South Island due to flooding and slips, most notably State Highway 6 between Hira and Havelock, severing the direct link between Nelson and Blenheim. In Taranaki, rivers rose rapidly on 18 August as extreme rainfall fell on Mt Taranaki, where more than a metre of rain was observed during the multi-day event. (see [Highlights and extreme events](#) section for more details).

While the atmospheric river event garnered the most headlines, it wasn't the only notable heavy rainfall during August. On 5-6 August, heavy rain in interior Canterbury led to high flows and erosion in some rivers, including the Ashburton and Rangitata rivers, while Haast Pass was closed due to flooding. Another significant rainfall event was more localised in Wellington on 8 August, which led to road closures and home evacuations in the city.

August 2022 was New Zealand's 2<sup>nd</sup>-warmest August on record (placing behind only August 2013), as well above average (>1.20°C above average) temperatures were observed in a majority of the North Island and the central South Island, and 56 locations experienced a record or near-record warm August. This included Gisborne having its warmest August since 1905, and Upper Hutt having its warmest August since 1939. The warmth was aided by a predominant northerly air flow during the month as high pressure was frequently stationed to the east of the country. It was a cloudy month in the upper and lower North Island and the top of the South Island, and this was reflected in warmer than usual overnight temperatures with many locations experiencing record or near-record high mean minimum (overnight) temperatures. The nights of the 19<sup>th</sup> and 20<sup>th</sup> August were particularly notable, as a northerly air flow directly out of the tropics led to numerous locations having their warmest August night on record. On 19 August, Kaitaia recorded a minimum temperature of 18.2°C, the warmest August minimum temperature on record for all of New Zealand. Overall, the nationwide average temperature in August 2022 was 10.3°C. This was 1.5°C above the 1981-2010 August average, based on NIWA's seven station temperature series which began in 1909.

Despite the very warm month overall, cold outbreaks typical of winter were still observed. On 7-8 August, substantial snowfall fell to relatively low elevations across interior Canterbury and Otago. At elevations of 500-600 metres, amounts of 5-10 cm were observed, including at locations such as Ranfurly, St Bathans, and Methven. In addition, on the 10<sup>th</sup> Invercargill recorded its 2<sup>nd</sup>-coldest August temperature since records began in 1905 with -6.4°C, while Manapouri had its 2<sup>nd</sup>-coldest August temperature since 1963 with -8.2°C.

**Further Highlights:**

- The highest temperature was 24.3°C, observed at Wairoa on 20 August.
- The lowest temperature was -8.2°C, observed at Manapouri on 10 August.
- The highest 1-day rainfall was 173 mm, recorded at Tākaka on 17 August.
- The highest wind gust was 180 km/h, observed at Puysegur Point on 5 August.
- Of the six main centres in August 2022, Auckland was the warmest, Christchurch was the coolest, Wellington was the wettest and least sunny, Dunedin was the driest, and Tauranga was the sunniest.
- Of the available, regularly reporting sunshine observation sites, the sunniest four regions in 2022 so far are Taranaki (1701 hours), Bay of Plenty (1675 hours), Greater Nelson (1621 hours) and Auckland (1564 hours).

**For further information, please contact:**

Seth Carrier  
Meteorologist/Forecaster  
Tel. 09 375 4508

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## Rainfall: Heavy rain and flooding for some areas, but unusually dry in others

Rainfall varied greatly in August, with some areas experiencing record-setting rainfall and flooding, while other locations were quite dry. Well above normal (>149% of normal) or above normal (120-149% of normal) rainfall was observed in northern Northland, parts of Auckland, western Waikato and Taranaki, southern Hawke's Bay, southern Manawatū-Whanganui to western Wellington, Tasman, Nelson, Marlborough, the West Coast, interior Canterbury, and northern Otago. Conversely, below normal rainfall (50-79% of normal) was observed in southern Northland, northern Waikato and the Coromandel, parts of Bay of Plenty and Gisborne, interior Manawatū-Whanganui, much of coastal Canterbury, southern Otago and eastern Southland. Pockets of well below normal rainfall (<50% of normal) occurred in eastern Bay of Plenty, Banks Peninsula, and near Dunedin. Elsewhere, near normal rainfall (80-119% of normal) was observed.

Overall, several locations in the North Island and top of the South Island saw record or near-record rainfall in August, including Tākaka receiving 689 mm (377% of its August normal) and Wellington (Kelburn) having its wettest August since 1928 with 237% of its normal rainfall. However, August rainfall was not evenly distributed about the country, and some eastern areas were quite sheltered from these rain-bearing systems and remained drier than normal. Notably, Waiouru received only 34% of its normal rainfall, making it the 3<sup>rd</sup>-driest August since records began in 1950. Elsewhere, well below normal rainfall was observed in Banks Peninsula and the Dunedin area.

### Record<sup>1</sup> or near-record August rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
<b>High records or near-records</b>				
Wellington (Kelburn)	275	237	1928	Highest
Takaka	689	377	1976	Highest
Paraparaumu	212	232	1945	2nd-highest
Stratford	397	208	1960	2nd-highest
Nelson	350	427	1862	2nd-highest
Oamaru	172	467	1941	2nd-highest
Okarito	416	163	1981	3rd-highest
Arthurs Pass	784	270	1906	3rd-highest
Clyde	52	207	1978	3rd-highest
Kerikeri	362	198	1935	4th-highest
Haast	529	169	1941	4th-highest
<b>Low records or near-records</b>				
Waiouru	33	34	1950	3rd-lowest

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<sup>1</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.

## Temperature: Exceptionally warm for large swaths of New Zealand

August 2022 was New Zealand's 2<sup>nd</sup>-warmest August on record. Well above average (>1.20°C above average) temperatures were observed in a majority of the North Island and the central South Island, and many locations experienced a record or near-record warm August. Above average temperatures (0.51-1.20°C above average) were observed in parts of Bay of Plenty, western Waikato, coastal South Canterbury, eastern Otago, and much of Southland. Isolated pockets of near average temperatures ( $\pm 0.50^\circ\text{C}$  of average) were observed in Tasman and Southland.

The nationwide average temperature in August 2022 was 10.3°C. This was 1.5°C above the 1981-2010 August average, based on NIWA's seven station temperature series which began in 1909.

### Record or near-record mean air temperatures for August were recorded at:

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Cape Reinga	14.0	1.4	1951	Highest
Mokohinau	14.3	1.3	1994	Highest
Leigh	14.3	1.6	1966	Highest
Whakatāne	11.8	1.6	1974	Highest
Taupo	9.6	2.4	1949	Highest
Motu	10.0	3.5	1990	Highest
Martinborough	10.8	1.9	1986	Highest
Ngawi	12.7	1.9	1972	Highest
Hicks Bay	13.1	1.7	1969	Highest
Gisborne	12.4	2.3	1905	Highest
Paraparaumu	11.4	2.0	1953	Highest
Porirua	11.3	2.0	1968	Highest
Wellington	11.7	1.5	1962	Highest
Upper Hutt	10.4	1.8	1939	Highest
Hawera	10.8	1.8	1977	Highest
Kaitia	13.8	1.6	1948	2nd-highest
Whangarei	13.3	1.3	1967	2nd-highest
Auckland (Mangere)	13.0	1.5	1959	2nd-highest
Taumarunui	10.1	1.6	1947	2nd-highest
Lower Retaruke	9.7	1.4	1966	2nd-highest
Mt Ruapehu (Chateau)	5.0	1.7	2000	2nd-highest
Dannevirke	10.1	1.6	1951	2nd-highest
Mahia	11.9	1.6	1990	2nd-highest
Whanganui	11.7	1.6	1937	2nd-highest
Westport	11.0	1.7	1937	2nd-highest
Arapito	11.1	1.8	1978	2nd-highest
Medbury	8.4	2.0	1927	2nd-highest
Stewart Island	8.4	1.4	1975	2nd-highest
Kerikeri	13.3	1.6	1945	3rd-highest
Whangaparaoa	13.3	1.4	1982	3rd-highest

Te Puke	11.6	1.5	1973	3rd-highest
Whatawhata	11.4	1.3	1952	3rd-highest
Port Taharoa	12.8	1.4	1973	3rd-highest
Masterton	10.3	2.0	1906	3rd-highest
Whakatu	10.9	2.1	1965	3rd-highest
Waipawa	9.8	1.3	1945	3rd-highest
Levin	10.9	1.5	1895	3rd-highest
Franz Josef	9.5	1.9	1953	3rd-highest
Waiau School	9.1	2.4	1974	3rd-highest
Rangiora	9.3	2.0	1965	3rd-highest
Windsor	8.0	1.8	2000	3rd-highest
Dunedin (Musselburgh)	9.2	1.5	1947	3rd-highest
Kaikohe	12.5	1.3	1973	4th-highest
Auckland (Whenuapai)	12.2	1.2	1945	4th-highest
Auckland (Western Springs)	12.8	1.3	1948	4th-highest
Tauranga	12.1	1.3	1913	4th-highest
New Plymouth	11.6	1.4	1944	4th-highest
Napier	11.4	1.4	1870	4th-highest
Wairoa	11.8	1.8	1964	4th-highest
Palmerston North	10.9	1.5	1928	4th-highest
Wellington (Kelburn)	10.8	1.4	1928	4th-highest
Takaka	10.0	1.3	1978	4th-highest
Okarito	9.9	1.5	1982	4th-highest
Secretary Island	10.5	1.2	1985	4th-highest
Culverden	8.8	2.2	1928	4th-highest
Cheviot	8.8	1.5	1982	4th-highest
<b>Low records or near-records</b>				
None observed				

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Whangarei	17.6	1.7	1967	Highest
Whitianga	17.1	1.8	1962	Highest
Whakatane	16.8	1.3	1974	Highest
Taupo	14.3	2.5	1949	Highest
Motu	14.5	3.4	1990	Highest
Auckland (Mangere)	16.7	1.8	1959	Highest
Gisborne	17.3	2.2	1905	Highest
Whakatu	16.8	2.6	1965	Highest
Waipawa	16.0	2.7	1945	Highest
Mahia	14.5	1.5	1990	Highest
Five Rivers	12.5	1.9	1982	Highest
Stewart Island	12.4	1.8	1975	Highest
Cape Reinga	16.4	1.4	1951	2nd-highest
Kerikeri	17.6	1.4	1945	2nd-highest

Whangaparaoa	16.1	1.3	1982	2nd-highest
Auckland (Whenuapai)	16.4	1.3	1945	2nd-highest
Paeroa	16.4	1.3	1947	2nd-highest
Tauranga	16.3	1.3	1913	2nd-highest
Whatawhata	15.8	1.5	1952	2nd-highest
Waikeria	16.0	1.4	1957	2nd-highest
Turangi	13.8	1.6	1968	2nd-highest
Mt Ruapehu (Chateau)	9.1	2.0	2000	2nd-highest
Paraparaumu	14.8	1.7	1953	2nd-highest
Arapito	15.5	1.7	1978	2nd-highest
Greymouth	14.5	1.7	1947	2nd-highest
Puysegur Point	12.5	1.5	1978	2nd-highest
Manapouri	12.1	2.0	1963	2nd-highest
Lumsden	12.4	1.8	1982	2nd-highest
Rotorua	14.2	1.7	1964	Equal 2nd-highest
Mokohinau	15.7	1.1	1994	3rd-highest
Leigh	17.4	2.1	1966	3rd-highest
Hamilton	15.8	1.1	1946	3rd-highest
Masterton	15.4	1.6	1906	3rd-highest
Dannevirke	14.3	1.8	1951	3rd-highest
Hicks Bay	15.9	1.4	1969	3rd-highest
Porirua	14.3	1.2	1968	3rd-highest
Hawera	14.2	1.5	1977	3rd-highest
Waiouru	10.8	2.0	1962	3rd-highest
Reefton	14.0	1.8	1960	3rd-highest
Secretary Island	13.3	1.1	1985	3rd-highest
Waiau School	15.4	2.7	1974	3rd-highest
Cheviot	14.7	1.7	1982	3rd-highest
Akaroa	15.0	1.9	1978	3rd-highest
Le Bons Bay	12.1	1.7	1984	3rd-highest
Middlemarch	13.4	2.1	2000	3rd-highest
Oamaru	13.1	1.4	1967	3rd-highest
Manapouri (West Arm)	9.1	1.4	1971	3rd-highest
Invercargill	12.6	1.7	1905	Equal 3rd-highest
Kaikohe	15.7	1.4	1973	4th-highest
Dargaville	16.9	2.2	1943	4th-highest
Matamata	16.3	2.0	1999	4th-highest
Ngawi	15.1	1.7	1972	4th-highest
Wairoa	16.7	1.9	1964	4th-highest
Palmerston North	15.2	1.7	1928	4th-highest
Takaka	15.2	1.1	1978	4th-highest
Okarito	13.8	0.8	1982	4th-highest
Franz Josef	13.9	1.6	1953	4th-highest
Medbury	13.9	1.7	1927	4th-highest
Christchurch (Gardens)	14.4	1.8	1863	4th-highest
Windsor	13.7	1.8	2000	4th-highest
Dunedin (Airport)	13.7	1.6	1962	4th-highest
Dunedin (Musselburgh)	12.9	1.7	1947	4th-highest

Cromwell	13.3	1.9	1949	4th-highest
<b>Low records or near-records</b>				
None observed				

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

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Mokohinau	12.9	1.5	1994	Highest
Motu	5.6	3.6	1990	Highest
Port Taharoa	10.0	1.9	1973	Highest
Martinborough	6.6	2.4	1986	Highest
Ngawi	10.2	2.0	1972	Highest
Paraparaumu	8.0	2.3	1953	Highest
Porirua	8.2	2.6	1968	Highest
Wellington (Airport)	9.4	2.0	1962	Highest
Upper Hutt	6.6	2.5	1939	Highest
Hawera	7.5	2.1	1977	Highest
Westport	7.8	2.3	1937	Highest
Cape Reinga	11.6	1.4	1951	2nd-highest
New Plymouth	8.3	1.7	1944	2nd-highest
Hicks Bay	10.2	2.0	1969	2nd-highest
Gisborne	7.4	1.9	1905	2nd-highest
Mahia	9.2	1.5	1990	2nd-highest
Wellington (Kelburn)	8.6	1.9	1928	2nd-highest
Whanganui	8.1	1.7	1937	2nd-highest
Arapito	6.8	2.0	1978	2nd-highest
Brothers Island	10.0	1.2	1997	2nd-highest
Leigh	11.2	1.2	1966	3rd-highest
Whakatāne	6.8	1.9	1974	3rd-highest
Taupo	5.0	2.4	1949	3rd-highest
Taumarunui	5.2	2.0	1947	3rd-highest
Masterton	5.6	2.8	1906	3rd-highest
Castlepoint	9.0	1.3	1972	3rd-highest
Medbury	2.9	2.2	1927	3rd-highest
Rangiora	4.0	2.1	1965	3rd-highest
Windsor	2.3	1.7	2000	3rd-highest
Kaitaia	10.3	1.7	1948	4th-highest
Whangarei	9.6	1.4	1967	4th-highest
Te Puke	7.1	1.9	1973	4th-highest
Mt Ruapehu (Chateau)	0.8	1.2	2000	4th-highest
Wairoa	6.9	1.7	1964	4th-highest
<b>Low records or near-records</b>				
None observed				



## August climate in the six main centres

August was a very warm month for all of the main centres, and Auckland, Tauranga, Wellington, and Dunedin each experienced near-record mean temperatures. Rainfall was extremely varied across the main centres, however, with Wellington experiencing its wettest August since records began there in 1928. Conversely, Christchurch and Dunedin were significantly drier than normal. Of the six main centres in August 2022, Auckland was the warmest, Christchurch was the coolest, Wellington was the wettest and least sunny, Dunedin was the driest, and Tauranga was the sunniest.

### August 2022 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland <sup>a</sup>	13.0	+1.5	Well above average - 2 <sup>nd</sup> highest on record
Tauranga <sup>b</sup>	12.1	+1.3	Well above average – 4 <sup>th</sup> highest on record
Hamilton <sup>c</sup>	10.7	+1.1	Above average
Wellington <sup>d</sup>	10.8	+1.4	Well above average – 4 <sup>th</sup> highest on record
Christchurch <sup>e</sup>	8.5	+1.3	Well above average
Dunedin <sup>f</sup>	9.2	+1.5	Well above average – 3 <sup>rd</sup> highest on record
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland <sup>a</sup>	142	121	Above normal
Tauranga <sup>b</sup>	91	83	Near normal
Hamilton <sup>c</sup>	111	94	Near normal
Wellington <sup>d</sup>	275	237	Well above normal – highest on record
Christchurch <sup>e</sup>	39	63	Below normal
Dunedin <sup>f</sup>	18	32	Well below normal
Sunshine			
Location	Sunshine (hours)		
Auckland <sup>a</sup>	149		
Tauranga <sup>b</sup>	183		
Hamilton <sup>g</sup>	140		
Wellington <sup>d</sup>	116		
Christchurch <sup>e</sup>	152		
Dunedin <sup>f</sup>	166		

<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

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## Highlights and extreme events

### Temperatures

The highest temperature was 24.3°C, observed at Wairoa on 20 August.

The lowest temperature was -8.2°C, observed at Manapouri on 10 August.

On 1 August, overnight temperatures dipped below zero, resulting in cancellations to the Wellington train network as ice formed on overhead power lines, causing trains to lose power.

On 10 August, Invercargill recorded its 2<sup>nd</sup>-coldest August temperature since records began in 1905 with -6.4°C, while Manapouri had its 2<sup>nd</sup>-coldest August temperature since 1963 with -8.2°C.

On 17 August, Waiau had its warmest August day on record since records began in 1974, reaching 24.0°C.

On 19 August, Kaitaia recorded a minimum temperature of 18.2°C, the warmest August minimum temperature on record for all of New Zealand. Meanwhile, Whangārei and Auckland set records for their warmest August night for the third consecutive night. Numerous additional North Island locations also set their own record or near-record warmest August minimum temperature mark between 19-20 August. These extremely warm overnight temperatures were driven by an air mass reaching New Zealand directly from the tropics.

On 20 August, a continued tropical air flow resulted in unusually warm temperatures across the North Island. Most notably, Wairoa reached 24.3°C, the 2<sup>nd</sup>-warmest August temperature on record in the North Island.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Whangarei	23.0	20th	1967	Highest
Warkworth	21.0	20th	1966	Highest
Whangaparaoa	19.7	21st	1982	Highest
Whitianga	21.7	21st	1962	Highest
Ngawi	22.1	19th	1972	Highest
Hastings	23.8	21st	1965	Highest
Waipawa	23.8	20th	1945	Highest
Wairoa	24.3	20th	1964	Highest
Porirua	18.8	19th	1968	Highest
Hawera	18.3	20th	1977	Highest
Ohakune	18.8	19th	1962	Highest
Waionaru	16.5	19th	1962	Highest
Whanganui	21.4	20th	1937	Highest
Westport	19.3	26th	1937	Highest
Waiau	24.0	17th	1974	Highest
Cape Reinga	19.4	4th	1951	2nd-highest
Dargaville	21.2	20th	1943	2nd-highest

Auckland (Whenuapai)	20.5	20th	1945	2nd-highest
Paeroa	20.3	20th	1947	2nd-highest
Auckland (Mangere)	21.2	20th	1959	2nd-highest
Masterton	21.4	19th	1906	2nd-highest
Dannevirke	20.5	19th	1951	2nd-highest
Gisborne	22.7	20th	1905	2nd-highest
Whakatu	23.5	21st	1965	2nd-highest
Greymouth	19.0	18th	1947	2nd-highest
Culverden	22.7	17th	1928	2nd-highest
Medbury	22.1	17th	1927	2nd-highest
Cheviot	22.2	6th	1982	2nd-highest
Waipara West	23.0	17th	1973	2nd-highest
Queenstown	20.1	5th	1871	2nd-highest
Lumsden	18.5	5th	1982	2nd-highest
Napier	22.4	20th	1868	Equal 2nd-highest
Paraparaumu	19.0	19th	1953	Equal 2nd-highest
Okarito	18.6	26th	1982	Equal 2nd-highest
Kerikeri	21.2	21st	1945	3rd-highest
Motu	18.9	21st	1990	3rd-highest
Mt Ruapehu (Chateau)	13.5	19th	2000	3rd-highest
Martinborough	20.4	18th	1986	3rd-highest
Mahia	20.1	20th	1990	3rd-highest
Palmerston North	20.3	18th	1918	3rd-highest
Farewell Spit	19.1	7th	1971	3rd-highest
Haast	18.6	26th	1949	3rd-highest
Hanmer Forest	23.4	17th	1906	3rd-highest
Manapouri (West Arm)	14.3	4th	1971	3rd-highest
Manapouri	17.0	31st	1963	3rd-highest
Five Rivers	18.3	5th	1982	3rd-highest
Roxburgh	20.9	5th	1950	3rd-highest
Pukekohe	19.5	20th	1969	Equal 3rd-highest
Wellington (Kelburn)	18.1	19th	1928	Equal 3rd-highest
Cromwell	20.6	5th	1949	Equal 3rd-highest
Hicks Bay	18.8	20th	1969	4th-highest
<b>Low records or near-records</b>				
Kaikoura	4.3	9th	1972	2nd-lowest
Waiau	2.6	8th	1974	2nd-lowest
Manapouri (West Arm)	1.0	9th	1972	Equal 2nd-lowest
Brothers Island	7.8	10th	1997	Equal 3rd-lowest
Akaroa	5.4	8th	1978	Equal 3rd-lowest
Kaikoura	4.3	9th	1972	2nd-lowest

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
<b>High records or near-records</b>				
Cape Reinga	15.9	19th	1971	Highest
Kaitaia	18.2	19th	1948	Highest
Kerikeri	16.7	19th	1952	Highest
Kaikohe	16.3	19th	1973	Highest
Dargaville	17.4	19th	1951	Highest
Whangarei	17.6	19th	1967	Highest
Mokohinau	16.7	19th	1994	Highest
Warkworth	15.8	19th	1966	Highest
Whangaparaoa	15.2	19th	1982	Highest
Auckland (Whenuapai)	16.4	19th	1951	Highest
Whitianga	16.8	19th	1971	Highest
Paeroa	17.3	19th	1971	Highest
Matamata	15.5	19th	1999	Highest
Tauranga	16.0	20th	1941	Highest
Whakatane	16.1	20th	1975	Highest
Rotorua	13.9	19th	1972	Highest
Taupo	14.6	19th	1950	Highest
Motu	14.4	20th	1990	Highest
Auckland (Mangere)	16.3	19th	1961	Highest
Whatawhata	15.5	20th	1952	Highest
Hamilton (Ruakura)	15.6	19th	1940	Highest
Hamilton (Airport)	16.2	19th	1946	Highest
Port Taharoa	16.7	19th	1974	Highest
Waikeria	16.1	19th	1972	Highest
Te Kuiti	15.4	19th	1959	Highest
Taumarunui	15.6	19th	1947	Highest
Turangi	13.3	20th	1968	Highest
New Plymouth	15.3	19th	1944	Highest
Lower Retaruke	15.7	19th	1972	Highest
Mt Ruapehu (Chateau)	9.9	19th	2000	Highest
Masterton	15.7	20th	1943	Highest
Dannevirke	14.0	20th	1951	Highest
Martinborough	15.3	20th	1986	Highest
Ngawi	15.5	20th	1972	Highest
Hicks Bay	15.8	19th	1972	Highest
Hastings	14.5	19th	1972	Highest
Waipawa	14.3	20th	1945	Highest
Wairoa	16.5	19th	1972	Highest
Mahia	14.3	20th	1990	Highest
Paraparaumu	15.9	19th	1972	Highest
Palmerston North	14.3	19th	1940	Highest
Levin	16.1	19th	1950	Highest

Porirua	14.7	19th	1972	Highest
Wellington (Kelburn)	14.4	19th	1931	Highest
Wellington (Airport)	15.0	20th	1972	Highest
Upper Hutt	15.7	19th	1972	Highest
Stratford	13.3	19th	1972	Highest
Hawera	15.5	19th	1977	Highest
Ohakune	14.0	19th	1972	Highest
Waiouru	12.2	19th	1972	Highest
Whanganui	16.8	20th	1972	Highest
Takaka	12.9	20th	1978	Highest
Farewell Spit	14.0	19th	1972	Highest
Hokitika	13.5	18th	1866	Highest
Reefton	12.3	20th	1972	Highest
Okarito	13.6	18th	1983	Highest
Franz Josef	12.6	18th	1953	Highest
Nelson	14.2	19th	1862	Highest
Appleby	13.0	18th	1941	Highest
Blenheim	15.0	20th	1947	Highest
Brothers Island	13.6	19th	1997	Highest
Pukekohe	15.1	19th	1969	Equal highest
Napier	15.1	21st	1940	Equal highest
Leigh	15.6	19th	1966	2nd-highest
Auckland (Western Springs)	16.2	19th	1971	2nd-highest
Te Puke	15.3	19th	1973	2nd-highest
Takapau Plains	12.5	20th	1972	2nd-highest
Gisborne	15.7	20th	1940	2nd-highest
Whakatu	14.1	19th	1972	2nd-highest
Westport	13.6	18th	1966	2nd-highest
Greymouth	12.9	18th	1972	2nd-highest
Richmond	13.7	20th	1862	2nd-highest
Arthurs Pass	8.2	20th	1973	2nd-highest
Orari Estate	10.5	6th	1972	2nd-highest
Mt Cook (Airport)	8.7	5th	1929	Equal 2nd-highest
Castlepoint	14.3	20th	1972	3rd-highest
Arapito	12.6	18th	1978	3rd-highest
Culverden	13.2	6th	1930	Equal 3rd-highest
Haast	11.9	17th	1949	4th-highest
Cheviot	10.1	3rd	1982	4th-highest
Waipara West	14.0	6th	1973	4th-highest
Middlemarch	11.3	5th	2000	4th-highest
Te Anau	9.1	6th	1973	4th-highest
<b>Low records or near-records</b>				
Manapouri	-8.2	10th	1963	2nd-lowest
Invercargill	-6.4	10th	1905	2nd-lowest
Rotorua	-5.0	13th	1964	3rd-lowest
Waipawa	-3.8	14th	1945	Equal 3rd-lowest
Mt Ruapehu (Chateau)	-8.0	13th	2000	4th-lowest
Middlemarch	-7.3	10th	2000	Equal 4th-lowest

## **Rain and slips**

The highest 1-day rainfall was 173 mm, recorded at Tākaka on 17 August.

Persistent rain falling on sodden soil in the Wellington region led to a number of major slips, as well as dozens of moderate and minor ones throughout the hill suburbs. On 1 August, two lanes on Bowen Street were closed due to slips. Again on 8 August, multiple slips due to heavy rain in Wellington led to road closures and home evacuations. Most notably, more than 25 residents living in eight homes were forced to evacuate after a steep bank collapsed at The Terrace. Other slips were reported in Horokiwi, Aro Valley, Wadestown, and Wilton, while there was flooding in Karaka Bay and Seatoun. The Seatoun Tunnel was closed due to the threat of a tree falling onto the road. Then on 26 August, Wellington trains on the Kāpiti line were suspended for several hours in the morning due to a slip blocking the tracks.

On 1 August slips in Marlborough Sounds caused portions of Kenepuru Road and Queen Charlotte Drive to be closed, while there were several slips reported on SH1 between Blenheim and Picton.

On 5-6 August, heavy rain in interior Canterbury led to high flows and erosion in some rivers, including the Ashburton and Rangitata rivers. Haast Pass was closed due to flooding.

On 8-9 August, heavy rain caused flooding in Puhoi, with water overtopping roads near the village centre and affecting the Puhoi General Store. There were reports of a car trapped in floodwater.

## **August 2022 atmospheric river and flooding event**

From 16-20 August, an atmospheric river of moisture extending from the tropics impacted New Zealand with a long-duration heavy rain and flooding event. An analysis by NIWA indicated it was the strongest August atmospheric river in the New Zealand region on record since at least 1959, with a maximum integrated water vapour transport value of 1749 kg/m/s. Values above 1250 kg/m/s are considered exceptional. This resulted in a 1-in-120 year rain event in Nelson.

The most heavily impacted areas included Northland, Taranaki, Wellington, and particularly Nelson, which observed severe flooding as rainfall amounts reached 2-4 times August normals in just a few days. States of Emergency were declared in Nelson-Tasman, West Coast, and Marlborough, while \$200,000 was announced for the Nelson-Tasman mayoral fund for immediate assistance. The mayor of Nelson said that the city's recovery may take years.

In Nelson, severe flooding was observed as the Maitai River burst its banks, with residents living near the river asked to evacuate. The river's flow reached a maximum of 459 cumecs on 17 August, nearly double its previous record flow of 237 cumecs in December 2011. Nearly 500 homes were evacuated in and around Nelson. In Tāhunanui, an entire house fell into a gully during a slip. Flooding also occurred in Dodson Valley in the suburb of Atawhai. The flooding at Devenish Place in Atawhai was so severe that the road surface was washed away, exposing underground pipes. Additionally, residents were evacuated from Paines Ford in Golden Bay, and extensive flooding was observed in parts of Richmond, Brightwater, and Appleby on 20 August. Flooding and slips resulted in the shutdown of the main water supply line from Maitai Reservoir to Nelson, with a backup line providing much reduced flow rates.

Numerous road closures occurred in the top of the South Island due to flooding and slips, most notably State Highway 6 between Hira and Havelock, severing the direct link between Nelson and Blenheim.

The detour via SH63 was also closed for a time, along with a small portion of SH1 in Blenheim. The Rocks Road section of SH6 in Nelson was also closed. SH60 saw flooding from Upper Tākaka to Collingwood, along with sections near Riwaka. Several roads were also closed due to flooding and slips about Marlborough Sounds, cutting off access to isolated communities there. On 20 August, SH1 south of Picton was closed for several hours due to the threat of flooding on the Wairau and Tuamarina rivers.

On 17 August, a voluntary evacuation order was announced for parts of Westport, Seddonville, and Mokihinui in the West Coast, covering about 140 households.

In the Wellington Region, heavy rainfall resulted in 170 slips between 18-21 August. Most notably, one slip on Sutherland Crescent in Melrose crushed three cars. Additional slips occurred on the Kapiti Coast on SH59 between Pukerua Bay and Paekākāriki, and the council warned that, in total, repairs in the district may take at least six weeks.

In Taranaki, rivers rose rapidly on 18 August as extreme rainfall fell on Mt Taranaki, where more than a metre of rain was observed during the multi-day event. Four homes near Okato were evacuated due to the threat of the Stony River bursting its banks after it rose more than two metres. Hundreds of homes lost power in Okaiawa, Opunake, and Pungarehu.

In Northland, the Kaeo River bridge along SH10 flooded on 18 August, as did SH1 at Rangiahua. Flooding cut off Kaitaia with no detours available, as nine local roads were closed due to flooding and slips, including SH1 through Mangamuka Gorge. Top Energy reported power cuts at six different places across the Far North, with a maximum of 1500 customers without power on 18 August. On SH1 near Hikurangi, three people were injured in a crash due to a fallen tree on the road.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Kaitaia	86	17th	1948	Highest
New Plymouth	100	18th	1944	Highest
Mt Ruapehu (Chateau)	97	6th	2000	Highest
Dannevirke	52	8th	1951	Highest
Mahia	538	5th	1990	Highest
Paraparaumu	68	18th	1951	Highest
Stratford	148	18th	1960	Highest
Okarito	114	16th	1981	Highest
Oamaru	120	18th	1950	Highest
South West Cape	172	27th	1991	Highest
Kerikeri	128	17th	1945	2nd-highest
Te Kuiti	65	18th	1957	2nd-highest
Takaka	173	17th	1976	2nd-highest
Appleby	80	19th	1932	2nd-highest
Farewell Spit	68	17th	1882	4th-highest
Arapito	53	19th	1978	4th-highest
Nelson	112	19th	1862	4th-highest
Richmond	110	19th	1862	4th-highest

## Wind

The highest wind gust was 180 km/h, observed at Puysegur Point on 5 August.

On 5 August, high winds in Southland blew over a campervan and a truck on Mossburn-Five Rivers Road. SH77 was closed at Mount Hutt due to a fallen tree and downed powerlines. Strong winds cut power to several small settlements south of Lake Wakatipu, including Kingston and Athol.

### Record or near-record August extreme wind gusts were recorded at:

Location	Extreme wind gust (km/h)	Date of extreme gust	Year records began	Comments
Mt Ruapehu (Chateau)	133	7th	2000	Highest
Mt Cook (Airport)	141	5th	2000	Highest
Wanaka	115	5th	1992	Highest
Windsor	91	2nd	2001	Highest
Middlemarch	128	2nd	2000	Highest
Clyde	102	5th	1983	Highest
Alexandra	141	5th	2001	Highest
Secretary Island	139	5th	1994	2nd-highest
Puysegur Point	180	5th	1986	2nd-highest
Winchmore	100	5th	1970	2nd-highest
Westport	100	8th	1973	Equal 2nd-highest
Ranfurly	78	5th	2000	Equal 2nd-highest
Paeroa	89	18th	1991	3rd-highest
Dunedin (Airport)	113	5th	1972	3rd-highest
Waiouru	115	18th	1970	Equal 3rd-highest
Lincoln	82	2nd	1999	Equal 3rd-highest
Manapouri (Airport)	72	1st	1991	Equal 3rd-highest
Kaikohe	87	18th	1986	Equal 4th-highest
Castlepoint	146	2nd	1972	Equal 4th-highest
Hawera	91	18th	1986	Equal 4th-highest
Tara Hills	87	5th	1985	Equal 4th-highest

## Snow and ice

On 1 August, a layer of snow caused the closure of the Desert Road from Waiouru to Rangipo until about 8:30 am.

On 7-8 August, substantial snowfall fell to relatively low elevations across interior Canterbury and Otago, with a dusting observed in Dunedin. At elevations of 500-600 metres, amounts of 5-10 cm were observed, including at locations such as Ranfurly, St Bathans, and Methven. SH8 between Fairlie and Twizel was closed, as was SH85 from Kyeburn to Alexandra. Some additional inland routes such as SH77 remained open, but chains were essential for travel.

On 24 August, operations became significantly limited at Mt Ruapehu's ski field Whakapapa and Tūroa was temporarily closed due to warm weather and a lack of snow. Operator Ruapehu Alpine Lifts indicated that both fields would lose a third of their 405 total staff.



## Cloud and fog

From 4-6 August, thick fog resulted in numerous flight cancellations each morning at Auckland Airport. On 4 August, 22 Air New Zealand regional flights were cancelled. On 5 August, 26 domestic regional flights were cancelled and nine were delayed, while on 6 August, 43 domestic flights were cancelled and 28 delayed, including flights from Wellington and Christchurch. Some Auckland ferry sailings were also cancelled on these days.

On 8 August, another 22 domestic regional flights were cancelled and 19 flights were delayed at Auckland Airport due to fog.

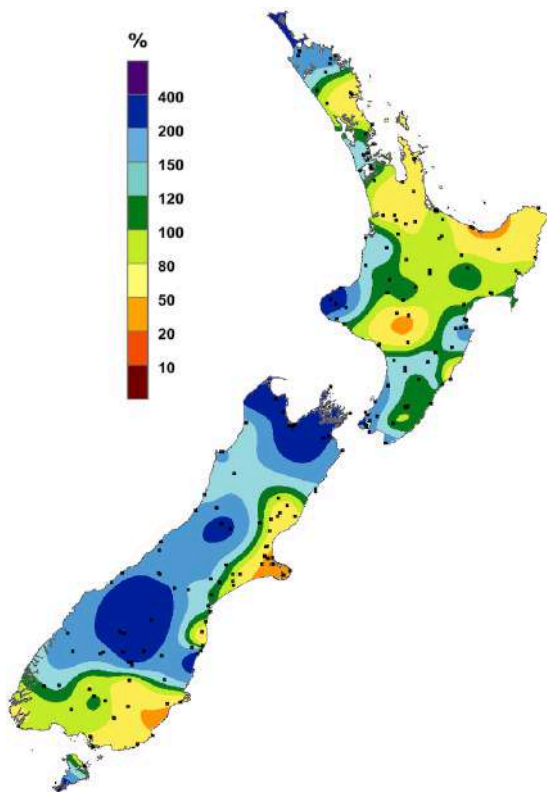
On 18 August, An Air New Zealand flight to Christchurch had to be diverted to Wellington due to fog. However, the plane couldn't land in Wellington due to strong winds. After two diversions, the aircraft finally touched down in Palmerston North.

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**For further information, please contact:**

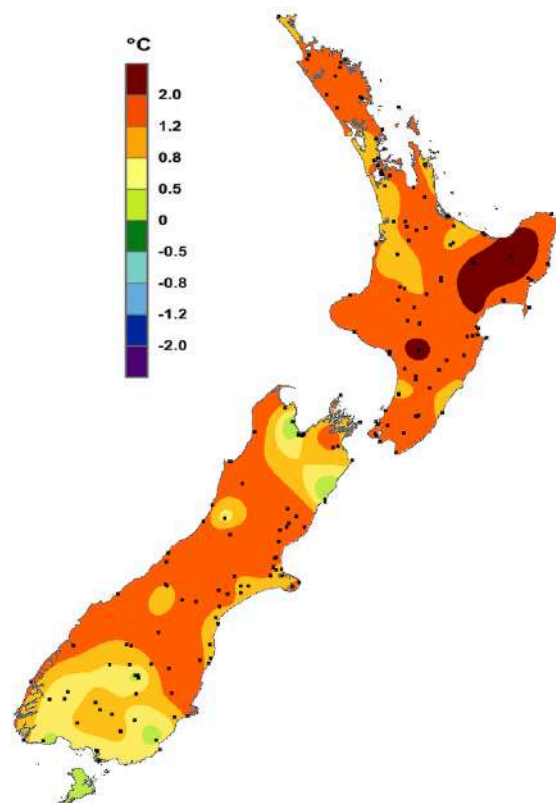
### Seth Carrier

Meteorologist/Forecaster, NIWA Auckland  
Tel. 09 375 4508



### August rainfall

Expressed as a percentage of the 1981-2010 normal.



### August temperature

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

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

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