

## Two ex-Tropical Cyclones Impact New Zealand

<b>Temperature</b>	Mean temperatures were above average (0.51 to 1.20°C of average) or well above average (>1.20°C of average) across the North Island. Temperatures were more than 2°C above the February average for parts of Hawke's Bay, Gisborne, and across lower Manawatu-Whanganui. In the South Island, temperatures were above average across the north and mostly near average (-0.50 to 0.50°C) across the central and south.
<b>Rainfall</b>	Rainfall was well above normal (>149% of normal) across much of the upper North Island, Wellington-Wairarapa, the upper South Island, Canterbury and Otago. Elsewhere, rainfall was above normal (120-149% of normal) or near normal (80-119% of normal).
<b>Soil Moisture</b>	As of 28 February, soils were wetter than normal for the time of year across the upper North Island and the central and upper South Island. Soil moisture was near normal elsewhere; although parts of Hawke's Bay, Gisborne, and Southland had slightly below normal soil moisture.

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### Overview

February 2018 was marked by two ex-Tropical Cyclones, Fehi and Gita, that impacted New Zealand on the 1<sup>st</sup> and 20<sup>th</sup> of the month, respectively. These two storms contributed to lower than normal sea level pressure that extended from the tropics to the north of New Zealand and southward across the country. The North Island had more northeast winds than normal, consistent with ongoing La Niña conditions, while the South Island observed only weak air flow anomalies. Sea surface temperatures (SSTs) in New Zealand coastal waters and across the Tasman Sea remained well above average during the month.

February was a contrasting month for temperatures, as the North Island experienced above (0.51 to 1.20°C of average) or well above average (>1.20°C of average) temperatures and the South Island had above average temperatures in the north and near (-0.50 to 0.50°C) or even slightly below average (-0.51 to -1.20°C of average) temperatures elsewhere. Many locations, particularly across the North Island, had near-record high mean monthly temperatures while just one South Island town (Clyde) observed near-record low mean monthly temperatures. The number of near-record high mean minimum temperatures outpaced near-record high mean maximums, and was a product of a very

humid month marked by sub-tropical and tropical airflows, therein keeping overnight temperatures elevated.

The nationwide average temperature in February 2018 was 18.0°C (0.8°C above the 1981-2010 February average from NIWA's seven station temperature series which begins in 1909).

The impact of ex-Tropical Cyclones Fehi and Gita led to above (120-149% of normal) or well above normal (>149% of normal) rainfall across parts of New Zealand during February. Rainfall totals in Tasman, Nelson, Marlborough, Canterbury, and Otago were 300 to 400% of the monthly normal in several locations. The lower North Island, including Wellington, experienced rainfall that was over 200% of the February normal as did northern Waikato, Auckland, and eastern Northland. In contrast, parts of Gisborne, Hawke's Bay, Manawatu-Whanganui and Southland were somewhat sheltered from the moist northerly-quarter airflows and observed near normal (80-119% of normal) or even slightly below normal (50-79% of normal) rainfall.

By the end of February, soil moisture levels were much above normal for the time of year across the upper and central North Island as well as the upper and eastern South Island. In the Grey and Buller Districts as well as Otago, where medium-scale adverse drought events had previously been declared, soil moisture levels had recovered to near or above normal. Meanwhile, soil moisture levels in Southland, and the eastern North Island remained below normal for the time of year.

Further Highlights:

- The highest temperature was 34.9°C, observed at Christchurch (Riccarton) on 1 February.
- The lowest temperature was 0.9°C, observed at Mt Cook (Village) on 21 February.
- The highest 1-day rainfall was 267 mm, recorded at Milford Sound on 25 February.
- The highest wind gust was 161 km/h, observed at Cape Foulwind on 1 February.
- Of the six main centres in February 2018, Auckland and Tauranga were the warmest, Dunedin was the coldest and least sunny, Christchurch was the driest, Hamilton was the wettest, Wellington was the sunniest.
- Of the available automatic sunshine observation sites, the sunniest four locations in 2018 so far (1 January – 28 February) are Lake Tekapo (483 hours), Cromwell (481 hours), Paraparaumu (473 hours) and Richmond (471 hours).

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## Temperature: A very warm and humid month in the north

February was a very warm and humid month for parts of New Zealand, particularly in the north. The nationwide average temperature was 18.0°C (0.8°C above the 1981-2010 February average from NIWA's seven station temperature series which begins in 1909). Temperatures were above (0.51 to 1.20°C of average) or well above average (>1.20°C of average) across the North Island and upper South

Island. In the middle and lower South Island, temperatures were mostly near average (-0.50 to 0.50°C) although a few locations observed below average (-0.51 to -1.20°C of average) temperatures. There were several near-records and one location that observed its warmest February on record in terms of mean temperature – this contrasts with January, which had many records in this category.

Overall, there were more near-records for high mean minimum temperature than high mean maximum temperature, which owes to a high frequency of humid airmasses moving over New Zealand, more moisture, and cloud cover which led to warmer temperatures at night. Notably, Dargaville had its warmest mean minimum temperatures on record during February (records go back to 1943), Masterton second-warmest (records go back to 1906), and Levin second-warmest (records go back to 1895).

Several locations also broke daily minimum temperature records for the month. Wellington (Kelburn) fell to just 20.2°C on 1 February, not only making it the warmest February minimum temperature, but the warmest minimum temperature of any month on record (records go back to 1928). Humidity was also a fixture in the capital, where on 11 February the city’s highest dew point (meteorological measure for humidity) was recorded. See more in the [highlights and extreme events](#) section.

**Record<sup>1</sup> or near-record mean air temperatures for February were recorded at:**

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Motu	18.0	2.2	1990	Highest
Hastings	21.1	2.5	1965	2nd-highest
Wairoa (North Clyde)	21.8	2.9	1964	2nd-highest
Mahia	20.3	2.0	1990	2nd-highest
Mokohinau	21.6	1.3	1994	3rd-highest
Ngawi	20.1	1.6	1972	3rd-highest
Hicks Bay	20.8	1.7	1969	3rd-highest
Gisborne	21.5	2.6	1905	3rd-highest
Levin	19.9	2.1	1895	3rd-highest
Hawera	18.7	1.8	1977	3rd-highest
Dargaville	21.2	1.7	1943	4th-highest
Leigh	21.9	1.8	1966	4th-highest
Whakatane	20.8	1.6	1974	4th-highest
Masterton (Te Ore Ore)	19.9	2.6	1906	4th-highest
Paraparaumu	19.5	2.1	1953	4th-highest
Farewell Spit	19.5	1.4	1971	4th-highest
Arapito	18.3	1.3	1978	4th-highest
Cheviot	17.3	0.9	1982	4th-highest
<b>Low records or near-records</b>				
None observed				

<sup>1</sup> The rankings (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>.etc) in all Tables in this summary are relative to climate data from a *group* of nearby stations, some of which may no longer be operating. The current climate value is compared against all values from any member of the group, without any regard for homogeneity between one station’s record, and another. This approach is used due to the practical limitations of performing homogeneity checks in real-time.

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Hastings	26.3	2.6	1965	2nd-highest
Mahia	23.6	2.1	1990	2nd-highest
Westport	22.7	2.2	1937	2nd-highest
Wairoa (North Clyde)	27.1	3.1	1964	3rd-highest
Mokohinau	23.7	1.1	1994	4th-highest
Gisborne	26.6	2.4	1905	4th-highest
Levin	24.1	1.7	1895	4th-highest
Kaikoura (Middle Creek)	21.9	1.9	1963	4th-highest
Hawera	23.0	1.9	1977	Equal 4th-highest
<b>Low records or near-records</b>				
Tara Hills	21.2	-2.1	1949	4th-lowest
Te Anau	18.6	-1.7	1963	4th-lowest

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

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
<b>High records or near-records</b>				
Dargaville	17.6	2.3	1943	Highest
Motu	13.8	2.9	1990	Highest
Mokohinau	19.6	1.6	1994	2nd-highest
Masterton (Te Ore Ore)	14.2	3.5	1906	2nd-highest
Ngawi	16.7	2.1	1972	2nd-highest
Hicks Bay	18.0	2.0	1969	2nd-highest
Hastings	16.0	2.4	1965	2nd-highest
Wairoa (North Clyde)	16.6	2.8	1964	2nd-highest
Mahia	16.9	1.8	1990	2nd-highest
Paraparaumu	16.1	2.8	1953	2nd-highest
Levin	15.8	2.5	1895	2nd-highest
Farewell Spit	16.2	2.1	1971	2nd-highest
Akaroa	13.9	2.0	1978	2nd-highest
Tauranga	17.5	2.0	1913	3rd-highest
Te Puke	16.1	2.5	1973	3rd-highest
Whakatane	16.9	2.8	1974	3rd-highest
Port Taharoa	17.6	1.8	1973	3rd-highest
Martinborough	14.2	2.4	1986	3rd-highest
Gisborne	16.5	2.5	1905	3rd-highest
Hawera	14.4	1.8	1977	3rd-highest
Arapito	13.8	1.6	1978	3rd-highest
Waiau	11.7	1.4	1974	3rd-highest
Kaitaia	17.8	2.1	1948	Equal 3rd-highest
Kerikeri	17.0	2.3	1945	4th-highest

Auckland (Whenuapai)	16.6	1.9	1945	4th-highest
Whitianga	16.7	2.2	1962	4th-highest
Paeroa	16.5	2.0	1947	4th-highest
Waiouru	10.9	2.2	1962	4th-highest
Brothers Island	15.7	1.2	1997	4th-highest
<b>Low records or near-records</b>				
None observed				

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## Rainfall: Two ex-tropical cyclones cause significant rainfall

The landfall of ex-Tropical Cyclones Fehi and Gita during February meant that ex-tropical cyclone activity in New Zealand is classified as above normal for the 2017-18 season; on average, one ex-tropical cyclone passes within 550 km of Auckland per season. These two storms brought significant rainfall to the country during the month and contributed to rounds of flooding, especially across the upper and eastern South Island.

Rainfall was well above normal across the upper and middle South Island, where numerous locations had more than 300% of normal rainfall. Nelson recorded 234 mm of rain for February 2018, which made it the wettest February in the 156-year historical record.

In Cromwell, 97 mm of rain occurred during the month, making it the wettest February on record for that station. This gave the town 35% of the total rainfall that it received last year -- Cromwell was New Zealand's second-driest location in 2017 (280 mm fell).

Kaikoura recorded 233 mm of rain during the month or 422% of the monthly normal or about a third of the annual normal. Most of this rain fell in an 18-hour window on 20 February during ex-Tropical Cyclone Gita.

The upper North Island had above or well above normal rainfall during February 2018, where Leigh and Warkworth observed their wettest February on record with 243 mm and 252 mm of rain, respectively.

### Record or near-record February rainfall totals<sup>2</sup> were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
<b>High records or near-records</b>				
Warkworth	252	288	1966	Highest
Nelson	234	368	1862	Highest
Appleby	240	344	1932	Highest
Blenheim	199	404	1927	Highest
Waipara West	167	408	1973	Highest
Akaroa	240	455	1977	Highest
Cromwell	97	277	1949	Highest
Clyde	101	254	1978	Highest
Leigh	243	346	1966	2nd-highest

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<sup>2</sup> Rainfall totals are rounded to the nearest whole number.

Paraparaumu	182	277	1945	2nd-highest
Takaka	311	263	1976	2nd-highest
Motueka (Riwaka)	336	392	1943	2nd-highest
Blenheim	181	398	1927	2nd-highest
Kaikoura (Middle Creek)	233	422	1898	2nd-highest
Lake Tekapo	154	430	1925	2nd-highest
Wellington (Kelburn)	185	261	1928	3rd-highest
Reefton	213	200	1960	3rd-highest
Ashburton	188	346	1909	3rd-highest
Timaru	178	355	1881	3rd-highest
Waimate	169	373	1898	3rd-highest
Tara Hills	101	305	1949	3rd-highest
Ranfury	122	329	1897	3rd-highest
Middlemarch	143	280	1896	3rd-highest
Oamaru	180	536	1941	3rd-highest
Lauder	113	287	1924	3rd-highest
Taupo	183	266	1949	4th-highest
Richmond	212	334	1862	4th-highest
Te Puke	210	198	1973	4th-highest
Waiouru	177	210	1950	4th-highest
Low records or near-records				
None observed				

## February climate in the six main centres

February was a rainy month with well above normal rainfall observed at all main centres, including Wellington's 3<sup>rd</sup> wettest on record. Temperatures were above average or well above average at 5 of the 6 main centres. Of the six main centres in February 2018, Auckland was the warmest, Dunedin was the coldest, sunniest and driest, Tauranga was the wettest and Hamilton was the least sunny.

### February 2018 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland <sup>h</sup>	21.0	+1.0	Above average
Tauranga <sup>b</sup>	21.0	+1.2	Well above average
Hamilton <sup>c</sup>	19.7	+0.9	Above average
Wellington <sup>d</sup>	18.5	+1.3	Well above average
Christchurch <sup>e</sup>	17.4	+0.6	Above average
Dunedin <sup>f</sup>	15.4	+0.4	Near average
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland <sup>a</sup>	185	258	Well above normal
Tauranga <sup>b</sup>	153	177	Well above normal
Hamilton <sup>c</sup>	203	274	Well above normal

Wellington <sup>d</sup>	185	228	Well above normal (3 <sup>rd</sup> highest on record)
Christchurch <sup>e</sup>	121	281	Well above normal
Dunedin <sup>f</sup>	136	201	Well above normal

Sunshine	
Location <sup>3</sup>	Sunshine (hours)
Auckland <sup>a</sup>	147
Tauranga <sup>b</sup>	159
Hamilton <sup>g</sup>	150 <sup>4</sup>
Wellington <sup>d</sup>	193
Christchurch <sup>e</sup>	181
Dunedin <sup>f</sup>	143

<sup>a</sup> Mangere <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>h</sup> Auckland Aero

## Highlights and extreme events

### Temperatures

On 1 February, the temperature soared into the mid-30s in and around Christchurch and gusty northwesterly winds contributed to two wildfires. Two helicopters and five ground crew battled one blaze near Cass Bay, Canterbury.

On 11 February, a warm and very humid air mass covered much of the country. The dew point temperature at Wellington (Kelburn) was 22.0°C at 6.00 p.m. This is Wellington's highest dew point temperature on record.

The dew point – a measure of humidity – failed to drop below 19°C in Auckland from February 10-15, making it a rare 115-hour period of very high humidity.

On 20-21 February, the passage of ex-Tropical Cyclone Gita caused an unseasonably cold southerly wind in the South Island, leading to several locations in Otago and Canterbury having record or near-record low daily maximum air temperatures. A maximum temperature of 10.2°C in Oamaru on the 21<sup>st</sup> was equal to the mean daily maximum air temperature during the month of July.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
<b>High records or near-records</b>				
Kaikoura (Middle Creek)	34.8	1st	1963	Highest
Whatawhata	30.6	12th	1952	Equal highest
Hawera	28.3	17th	1977	2nd-highest

<sup>3</sup> Tauranga, Wellington and Christchurch record sunshine using Campbell-Stokes manual sunshine recorders, whereas Auckland, Hamilton and Dunedin record sunshine with high-precision electronic sensors.

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

Leigh	29.8	19th	1966	3rd-highest
Cheviot	34.6	1st	1982	3rd-highest
Mt Cook (Village)	32.1	16th	1929	3rd-highest
Te Kuiti	30.4	12th	1959	Equal 3rd-highest
Akaroa	34.0	1st	1978	Equal 3rd-highest
Whitianga	30.2	15th	1962	4th-highest
Dannevirke	31.2	1st	1951	4th-highest
<b>Low records or near-records</b>				
Oamaru	10.2	21st	1972	Lowest
Cromwell	10.6	21st	1949	Lowest
Alexandra	10.5	21st	1930	Lowest
Roxburgh	10.5	21st	1950	Lowest
Cape Reinga	18.2	8th	1971	2nd-lowest
Secretary Island	12.3	5th	1989	2nd-lowest
Tara Hills	9.4	21st	1949	2nd-lowest
Wanaka	9.1	21st	1972	2nd-lowest
Oamaru	11.8	20th	1972	2nd-lowest
Clyde	11.0	21st	1978	2nd-lowest
Akaroa	13.0	21st	1978	Equal 2nd-lowest
Queenstown	9.6	21st	1871	Equal 2nd-lowest
Waipara West	12.7	20th	1973	3rd-lowest
Lake Tekapo	6.8	21st	1928	3rd-lowest
Dunedin (Airport)	11.2	21st	1972	3rd-lowest
Mt Cook (Village)	6.9	21st	1929	4th-lowest
Timaru	11.3	21st	1885	4th-lowest

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
<b>High records or near-records</b>				
Kaitaia	22.2	20th	1948	Highest
Kerikeri	22.2	20th	1952	Highest
Mokohinau	22.4	20th	1994	Highest
Whangaparaoa	21.4	19th	1982	Highest
Auckland (Whenuapai)	22.1	13th	1951	Highest
Auckland (Motat)	22.1	13th	1971	Highest
Paeroa	22.2	13th	1971	Highest
Te Puke	21.4	13th	1973	Highest
Whakatane	22.4	20th	1975	Highest
Rotorua	20.8	13th	1972	Highest
Hamilton	21.8	13th	1946	Highest
Port Taharoa	22.1	13th	1974	Highest
Te Kuiti	22.1	13th	1959	Highest
New Plymouth	21.6	12th	1944	Highest
Masterton (Te Ore Ore)	21.3	13th	1943	Highest
Hicks Bay	21.7	12th	1972	Highest
Palmerston North	20.6	12th	1940	Highest



Levin	21.2	12th	1950	Highest
Wellington (Kelburn)	20.2	1st	1931	Highest
Stratford	20.0	12th	1972	Highest
Hawera	20.9	12th	1977	Highest
Wanganui (Spriggens Park)	22.0	1st	1972	Highest
Farewell Spit	20.2	1st	1972	Highest
Brothers Island	19.3	1st	1997	Highest
Akaroa	21.8	1st	1978	Highest
Kaitaia	22.1	20th	1948	Equal highest
Whatawhata	21.5	13th	1952	Equal highest
Castlepoint	22.0	13th	1972	Equal highest
Wellington (Airport)	21.0	1st	1972	Equal highest
Cape Reinga	20.9	20th	1971	2nd-highest
Whangarei	22.1	13th	1967	2nd-highest
Leigh	22.1	19th	1966	2nd-highest
Auckland (Airport)	22.3	13th	1961	2nd-highest
Pukekohe	21.6	13th	1969	2nd-highest
Ngawi	23.1	13th	1972	2nd-highest
Waipawa	20.4	12th	1945	2nd-highest
Mahia	20.8	21st	1990	2nd-highest
Paraparaumu	20.5	17th	1972	2nd-highest
Westport	19.9	1st	1966	2nd-highest
Greymouth	18.8	1st	1972	2nd-highest
Haast	18.4	1st	1949	2nd-highest
Whitianga	21.9	13th	1971	Equal 2nd-highest
Ohakune	18.1	12th	1972	Equal 2nd-highest
Tauranga	21.8	12th	1941	3rd-highest
Hastings	21.2	13th	1972	3rd-highest
Arapito	19.6	1st	1978	3rd-highest
Waiau	21.2	1st	1974	3rd-highest
Kaikohe	20.7	11th	1973	4th-highest
Taupo	19.6	13th	1950	4th-highest
Taupo	19.5	12th	1950	4th-highest
Martinborough	20.8	13th	1986	4th-highest
Wairoa (North Clyde)	22.3	20th	1972	4th-highest
Upper Hutt (Trentham)	19.4	17th	1972	4th-highest
Takaka	19.3	1st	1978	4th-highest
Motueka (Riwaka)	19.6	1st	1972	4th-highest
Hanmer Forest	20.2	1st	1972	4th-highest
Franz Josef	16.8	1st	1953	Equal 4th-highest
Rangiora	18.9	1st	1972	Equal 4th-highest
<b>Low records or near-records</b>				
Kaikoura (Middle Creek)	6.1	4th	1963	3rd-lowest

## Rain and slips

## Impacts from ex-Tropical Cyclone Fehi

On 1 February, approximately 115 tourists became stranded at Fox Glacier as heavy rain and damaging winds from ex-Tropical Cyclone Fehi impacted the West Coast. Roads between Haast and the Fox Hills were then cleared the following day, 2 February, allowing travel to begin again. Greymouth was impacted by heavy rain and gales, which led to power cuts, closed schools, and closed shops in the CBD. A state of emergency was declared in the Buller District, West Coast. The Westland Milk Factory in Hokitika stopped production and dozens of farmers in the region had to dump milk because of power cuts and impassable roads. A state of emergency was also declared in Dunedin due to rain and flooding. Wastewater overflows contributed to the flood situation. Welfare centres were opened in Dunedin due to the adverse weather. The floodwaters began to recede by the evening.

The Nelson region was also particularly hard-hit by ex-Tropical Cyclone Fehi. Evacuations took place in Ruby Bay due to storm surge that inundated many homes in the area. In Monaco, police used a Nelson Surf Rescue inflatable boat to help people off the peninsula. Numerous roadways were closed about Nelson and flights were suspended at Nelson airport after a nearby stream burst its banks, flooding the airport's access road. Rocks Road was closed due to waves crashing overtop of it.

Furthermore, roads in Christchurch's suburbs of New Brighton, Aranui, Opawa, and parts of the CBD were closed due to flooding.

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On the afternoon of 3 February, flash flooding in the Waitakere Ranges led to the death of two teenagers. The two were from a group of five that attempted to cross the swollen river beneath the Cascades Falls around 5:00 pm. A band of very heavy rain pushed onshore the western Auckland region during the late afternoon – it had been associated with remnant energy from ex-Tropical Cyclone Fehi that had impacted the South Island the day prior.

On 11 February, heavy rain in Nelson flooded roads, threatened homes, and downed trees during the afternoon. The Maitai River through central Nelson overflowed at some points onto area roadways. Slips were also reported on State Highway 60 between Takaka and Richmond. Council contractors cleared away fallen trees in Lower Moutere and Glenhope in the Tasman District. Also, heavy rain in the Auckland region contributed to surface flooding in Whangaparaoa.

On 13 February, heavy rain contributed to flooding in the Opotiki District of the Bay of Plenty. Opotiki mayor John Forbes said that about 20 percent of the town was flooded and damage to the roads could cost Opotiki District Council \$1 million. Opotiki District Council reported that the Otara River, which runs through the town, recorded its highest-ever level.

On 13 February, heavy rain across the Far North District in Northland led to flooding and slips, particularly around the Mangamuka Ranges. A slip blocked State Highway 1 near Rangiahua, making the roadway impassable. State Highway 11 in the Bay of Islands was also closed. In addition, the Ministry of Education said 16 schools in Northland and one early childhood centre had closed due to the inclement weather.

On 18 February, rain and thunderstorms caused a number of slips on State Highway 6 between Whataroa and Haast, Westport and Greymouth, and at Barrytown.

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## Impacts from ex-Tropical Cyclone Gita

A state of emergency was declared in Christchurch, the Selwyn District, the Grey District, the Buller District, the New Plymouth District, and the Nelson-Tasman region, as ex-Tropical Cyclone Gita approached.

On 20 February, more than 40 schools and 17 early learning centres at the top of the South Island were either closed or closed early due to the forecast of heavy rain and wind from ex-Tropical Cyclone Gita. Numerous schools closed across the lower North Island and upper and eastern South Island on Wednesday 21 February. State Highway 6 from Westport to Greymouth closed due to surface flooding and strong winds. State Highway 60 from Riwaka to Takaka, State Highway 1 near Kaikoura, and Route 70 were also closed for a time. Between 4:00 am and 6:00 pm, 148.4 mm of rain was recorded in Motueka-Riwaka. In other words, that is 173% of the February normal rainfall in just 14 hours. This led to the Little Sydney Stream, Riwaka River, and Motueka River bursting their banks, flooding, and localised evacuations across the region – the towns most affected included Motueka, Takaka, Marahau, Upper Moutere, and across the Riwaka Plains. 4000 homes also lost power in the region and a horse got trapped in the flooding Moteuka River. Takaka Hill Road, shut by slips isolating about 6000 locals and tourists in Golden Bay, was expected to remain closed for days.

Between 4:00 am 20 February and 10:00 am 21 February, 202.0 mm of rain was recorded in Kaikoura. That amount is nearly four times the monthly normal, 28% of the annual normal rainfall, and was more rain in less than 24 hours than had fallen in November, December, and January combined. Furthermore, 53.6 mm fell between 4:00-5:00 pm on the 20<sup>th</sup>, which was the wettest hour on record in Kaikoura and over a month's worth of rain in a single hour. This led to flooding across various areas in the Kaikoura District and a car got swept off the road on State Highway in Hapuku north of the town. Some residents living alongside Christchurch's Heathcote River evacuated their homes as the waterway threatened to burst its banks. South of Christchurch, a portion of Speechlys Bridge on State Highway 1 between Geraldine and Fairlie was washed out.

Elsewhere, two lanes of Auckland's Tamaki Drive were closed due to surface water as waves spilled over the seawall onto the road during high tide. State Highway One was closed between Pukerua Bay and Paekakariki after it sustained seawall damage overnight due to storm surge during high tide. Debris also covered the roadway.

Between 20-21 February, Fire and Emergency New Zealand had responded to more than 400 weather-related callouts between 2:00 pm on Tuesday and 5:00 am Wednesday. Taranaki, Tasman, and the West Coast were the busiest areas, with many callouts due to flooding of homes and businesses, roofs lifting, and fallen trees and power lines.

On 22 February, flooding during high tide forced the evacuation of five houses in Paraparaumu and Raumati South between 2:00 am and 4:00 am as remnant energy from ex-Tropical Cyclone Gita passed through the region.

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On 25 February, four helicopters were used to fly stranded tourists out of Doubtful Sound (Fiordland) after a 25 metre slip cut off Wilmot Pass Road. Between 24-25 February, 281 mm of rain fell in nearby Milford Sound.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Nelson	116	11th	1862	Highest
Kaikoura (Middle Creek)	164	20th	1898	Highest
Waipara West	117	20th	1973	Highest
Akaroa	158	20th	1977	Highest
Motueka (Riwaka)	126	20th	1956	2nd-highest
Lake Tekapo	72	20th	1925	2nd-highest
Oamaru	62	20th	1950	2nd-highest
Lauder	48	1st	1924	2nd-highest
Clyde	43	20th	1978	Equal 2nd-highest
Takaka	109	11th	1976	3rd-highest
Blenheim	75	20th	1927	3rd-highest
Christchurch (Airport)	61	20th	1873	3rd-highest
Lincoln	56	20th	1881	3rd-highest
Orari Estate	104	20th	1897	3rd-highest
Timaru	71	20th	1881	3rd-highest
Tara Hills	41	1st	1949	3rd-highest
Wanaka	51	1st	1927	3rd-highest
Manapouri	125	16th	1971	3rd-highest
Leigh	85	3rd	1967	4th-highest
Mahia	62	9th	1990	4th-highest
Wellington (Kelburn)	69	20th	1928	4th-highest
Wellington (Airport)	64	20th	1958	4th-highest
Nelson	108	11th	1862	4th-highest
Blenheim	69	20th	1927	4th-highest
Ashburton	91	20th	1927	4th-highest
Waimate	72	20th	1898	4th-highest
Ranfurly	41	1st	1897	4th-highest
Dunedin (Airport)	50	1st	1962	4th-highest
Dunedin (Musselburgh)	59	1st	1918	4th-highest

**Wind**

**Impacts from ex-Tropical Cyclone Fehi**

On 1 February, State Highway 6 from Greymouth to Westport was closed due to fallen trees and strong winds. Similarly, State Highway 8 between Roxburgh and Millers Flat in Otago was also closed. 6500 Hokitika residents were without power due to wind and rain impacts from ex-Tropical Cyclone Fehi. Transpower warned that the town could have a “long spell” off the grid. Strong northeast winds, the passage of ex-Tropical Cyclone Fehi to the southwest, and king tides, all combined to cause coastal inundation along Auckland’s east coast. This led to the closure of Tamaki Drive during the morning. Winds up to 140 km/h in Wellington led to the cancellation of nine flights out of the city.

## Impacts from ex-Tropical Cyclone Gita

On 20 February, due to the forecast of high winds from ex-Tropical Cyclone Gita, Air New Zealand cancelled all flights in and out of Wellington from 2:45 pm until midnight. It also cancelled services in and out of Hokitika, Nelson, New Plymouth, and Queenstown for a time. KiwiRail's TranzAlpine rail service between Greymouth and Christchurch was cancelled for both the 20<sup>th</sup> and 21<sup>st</sup> of February due to expect impacts from ex-Tropical Cyclone Gita. Strong winds from ex-Tropical Cyclone Gita across the Taranaki region led to power cuts in 23000 properties. The pipeline from the New Plymouth water treatment station to the Mangorei Reservoir was ruptured by a falling tree and residents were urged to conserve water and only use the bare minimum. Fallen trees and traffic accidents were also reported, and sections of State Highway 3 from Urenui to Waitara were closed for tree removal.

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

Location	Extreme wind gust (km/h)	Date of extreme gust	Year records began	Comments
Kaikohe	154	1st	1986	Highest
New Plymouth	104	20th	1972	Highest
Hawera	130	20th	1986	Highest
Waiouru Airstrip	113	1st	1970	Highest
Farewell Spit	95	20th	1973	Equal highest
Kaitaia	100	7th	1972	2nd-highest
Baring Head	137	1st	1991	2nd-highest
Mt Kaukau	143	1st	1969	2nd-highest
Wanganui	109	20th	1977	2nd-highest
Secretary Island	115	25th	1994	2nd-highest
Wanaka Aero	82	18th	1992	2nd-highest
Wellington (Kelburn)	137	1st	1972	Equal 2nd-highest
Wellington (Airport)	124	1st	1972	Equal 2nd-highest
Diamond Harbour	95	1st	1980	Equal 2nd-highest
Blenheim Aero	85	1st	1972	3rd-highest
Oamaru	74	1st	1984	Equal 3rd-highest
Dargaville	82	20th	1997	4th-highest
Dannevirke	74	26th	1961	Equal 4th-highest
Mahia	78	1st	1991	Equal 4th-highest
Oamaru	72	2nd	1984	Equal 4th-highest
Queenstown	83	1st	1972	Equal 4th-highest
South West Cape	152	25th	1991	Equal 4th-highest

### Lightning and hail

On 18 February, the West Coast observed around 9000 lightning strikes as a frontal boundary moved up the South Island. The heavy rain associated with these thunderstorms caused flooding and slips.

### Cloud and fog

On 10-11 February, Wellington Airport saw numerous flights delayed or cancelled due to low clouds and dense fog. A moist and humid sub-tropical airmass created ideal meteorological conditions for fog to form.

## Snow and Ice

On 1 February, Mt Hutt recorded 5cm of snow as ex-Tropical Cyclone Fehi passed the South Island leading to an outbreak of cold, southerly winds.

On 2 February, the ski fields at Cardrona, between Queenstown and Wanaka, had a dusting of snow.

On 21 February, the Crown Range was dusted with snow as a cold southerly pushed into the South Island in ex-Tropical Cyclone Gita's wake. The Remarkables Ski area near Queenstown report 50 cm with drifts up to 1 m deep.

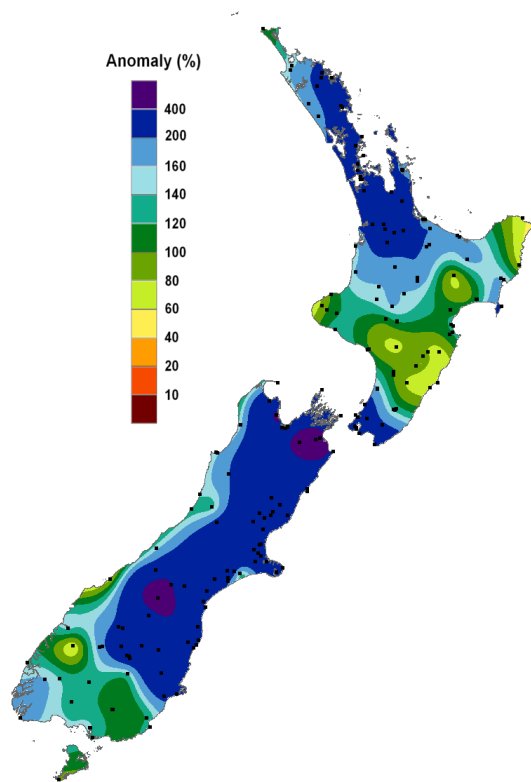
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February 2018 rainfall compared to the 30-year normal (1981-2010 normal).

February 2018 was a particularly wet month across parts of New Zealand, mostly due to the impact of ex-Tropical Cyclones Fehi and Gita.

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