

## A mild month overall and dry for eastern areas of the country.

<b>Temperature</b>	July temperatures were above average (+0.51°C to +1.20 °C) in many parts of New Zealand. It was an especially warm month for much of the inland South Island, Kaikoura and Auckland where well above average mean temperatures (> +1.20°C) were observed.
<b>Rainfall</b>	It was a very dry month for many eastern areas of the country, particularly in Gisborne, Hawke's Bay, coastal Wairarapa and eastern Canterbury, where rainfall was well below normal (<50% of normal). Conversely, rainfall was well above normal (>149% of normal) or above normal (120-149% of normal) for most remaining parts of the South Island, Whanganui and the Central Plateau.
<b>Sunshine</b>	July sunshine was well above normal (>125% of normal) or above normal (110-125% of normal) in many parts of the country. It was especially sunny for this time of year in south Otago, Central Otago, eastern Canterbury and the southern North Island.
<b>Soil Moisture</b>	At the end of July 2016, soil moisture levels were below normal for the time of year for eastern parts of the South Island north of Ashburton, and eastern parts of the North Island, particularly coastal Wairarapa. Soil moisture levels for the remainder of the country were near normal for this time of year.

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### Overview

During July 2016, mean sea-level pressures were lower than normal over and to the south of New Zealand. This pressure pattern resulted in a prevalence of winds from a westerly direction. July temperatures were above average (+0.51°C to +1.20°C above the July average) in many parts of the country. It was a particularly warm month for Central Otago, the Southern Lakes, the Mackenzie Basin, Kaikoura and Auckland which recorded well above average temperatures (>1.20°C above the July average). Eastern parts of the lower South Island, the West Coast and the Central Plateau observed near average July temperatures (-0.51°C to +0.50°C of the July average). The nationwide average temperature in July 2016 was 8.6°C (0.7°C above the 1981-2010 July average from NIWA's seven station temperature series which begins in 1909), making July 2016 the 10th-warmest July on record using this series. The first seven months of 2016 have all been warmer than normal, and January-July

2016 is the warmest January-July period in the seven station temperature record with a departure from average of +1.3°C.

The prevalence of winds from a westerly direction was clearly reflected in the rainfall totals observed throughout the country. Eastern areas of both the North Island and South Island were in the rain shadow of these prevailing winds and very dry as a result, with well below normal rainfall (<50% of the July normal) observed in parts of Gisborne, Hawke's Bay, coastal Wairarapa and eastern Canterbury. In contrast, it was a wet month for areas more exposed to the westerly winds, including southern, western and inland parts of the South Island, Whanganui and the Central Plateau, where rainfall was typically well above normal (>149% of the July normal) or above normal (120-149% of the July normal). It was a particularly wet month for inland parts of Southland and Otago, Mount Cook Village, Milford Sound, Reefton and Westport which recorded more than double their normal July rainfall respectively. Rainfall was near normal (80-119% of the July normal) for most of Northland, Auckland, the Bay of Plenty and Taranaki.

As at 1 August 2016, soil moisture levels were below normal for the time of year for eastern parts of Canterbury and Marlborough north of Ashburton, coastal Wairarapa and Hawke's Bay. Soil moisture levels were mostly near normal for remaining parts of New Zealand.

July sunshine was well above normal (>125% of the July normal) in Paraparaumu, Wellington, eastern Canterbury, Central Otago, the Southern Lakes and south Otago, and above normal (110-125% of the July normal) for most remaining areas of New Zealand. The exceptions were areas of Northland, Auckland, the Central Plateau and the West Coast where July sunshine was near normal (90-109% of the July normal).

**Further Highlights:**

- The highest temperature was 22.3°C, observed at Christchurch (Riccarton) on 23 July.
- The lowest temperature was -8.7°C, observed at Hanmer Forest on 12 July.
- The highest 1-day rainfall was 225 mm, recorded at North Egmont on 13 July.
- The highest wind gust was 195 km/hr, observed at Cape Turnagain on 24 July.
- Of the six main centres in July 2016, Christchurch was the coolest, driest and sunniest, Auckland was the warmest, Tauranga was the wettest, and Dunedin was the cloudiest.
- Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2016 so far (1 January – 31 July) were Richmond (1636 hours), Blenheim (1515 hours), New Plymouth (1451 hours) and Takaka (1444 hours).

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## Temperature: Warmer than normal overall

The exceptionally warm start to the year has continued, with a number of locations observing record or near-record high mean, mean maximum and mean minimum temperatures in July. Over the past six months, only one location has recorded a record or near-record low mean, mean maximum and mean minimum temperatures (Motu, this month). Sea surface temperatures to the north and west of New Zealand remain higher than normal for the time of year, and this has contributed to the warmer than normal air temperatures that continue to be observed in many parts of the country. The nationwide average temperature in July 2016 was 8.6°C (0.7°C above the 1981-2010 July average from NIWA's seven station temperature series which begins in 1909).

### Record<sup>1</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>				
Christchurch (Riccarton)	8.5	2.2	1863	Highest
Kerikeri	12.6	1.2	1981	2nd-highest
Kaikohe	12.9	1.9	1973	2nd-highest
Waipawa	8.6	0.9	1945	2nd-highest
Kaikoura	10.0	1.9	1963	2nd-highest
Lauder	4.7	2.7	1924	2nd-highest
Whangarei	12.7	1.1	1967	3rd-highest
Whatawhata	10.8	1.5	1952	3rd-highest
Paraparaumu	10.1	1.4	1953	3rd-highest
Culverden	6.5	1.5	1928	3rd-highest
Waiau	6.6	1.6	1974	3rd-highest
Cheviot	7.2	1.2	1982	3rd-highest
Kaitaia	13.1	1.1	1948	4th-highest
Auckland (Whenuapai)	11.4	1.2	1945	4th-highest
Auckland (North Shore)	12.4	0.9	1994	4th-highest
Masterton	8.8	1.5	1992	4th-highest
Ngawi	11.2	1.0	1972	4th-highest
Mahia	10.9	0.9	1990	4th-highest
Wellington (Airport)	10.7	1.1	1962	4th-highest
Cape Campbell	10.5	1.3	1953	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 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>				
Kerikeri	16.9	1.0	1981	Highest
Kaikohe	15.8	1.8	1973	Highest
Christchurch (Riccarton)	15.3	4.2	1863	Highest
Waipawa	13.8	1.4	1945	2nd-highest
Kaikoura	13.5	2.6	1963	2nd-highest
Cheviot	13.5	1.8	1982	2nd-highest
Orari Estate	12.5	2.2	1972	2nd-highest
Auckland (Mangere)	15.7	1.2	1959	3rd-highest
Masterton	14.1	1.5	1992	3rd-highest
Napier	15.6	2.0	1870	3rd-highest
Hastings	15.4	2.0	1965	3rd-highest
Wairoa	15.7	1.8	1964	3rd-highest
Paraparaumu	14.0	1.5	1953	3rd-highest
Levin	14.0	1.3	1895	3rd-highest
Hawera	13.1	1.1	1977	3rd-highest
Waiau	12.9	2.0	1974	3rd-highest
Winchmore	12.9	2.3	1928	3rd-highest
Christchurch (Airport)	12.9	2.0	1863	3rd-highest
Lincoln	12.9	2.1	1881	3rd-highest
Lumsden	10.1	1.5	1982	3rd-highest
Lauder	10.0	3.2	1924	3rd-highest
Kaitaia	16.4	1.0	1948	4th-highest
Whangaparaoa	15.0	0.9	1982	4th-highest
Whatawhata	14.8	1.1	1952	4th-highest
New Plymouth	14.2	0.9	1944	4th-highest
Ngawi	13.7	1.1	1972	4th-highest
Mahia	13.6	1.1	1990	4th-highest
Palmerston North	13.6	1.0	1928	4th-highest
Wellington (Airport)	13.5	1.2	1962	4th-highest
Whanganui	14.8	1.6	1937	4th-highest
Blenheim	14.1	1.1	1941	4th-highest
Timaru	12.3	1.7	1885	4th-highest
Cromwell	10.5	2.5	1949	4th-highest
<b>Low records or near-records</b>				
None observed				

**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>				
Cape Reinga	11.3	1.1	1951	3rd-highest
Kerikeri	8.3	1.4	1981	2nd-highest
Kaikohe	10.0	2.0	1973	2nd-highest
Whangarei	9.3	1.5	1967	3rd-highest
Auckland (North Shore)	9.2	1.4	1994	4th-highest
Whatawhata	6.8	1.8	1952	4th-highest
Ngawi	8.8	1.0	1972	4th-highest
Cape Campbell	8.2	1.2	1953	3rd-highest
Lauder	-0.7	2.1	1924	3rd-highest
<b>Low records or near-records</b>				
Motu	0.1	-2.1	1990	Lowest

**Rainfall: Dry in eastern parts, but wet for much of the South Island.**

July was a dry month for many eastern locations in New Zealand, although record or near-record low rainfall was only observed at five stations. It was an especially dry July in Mahia (northern Hawke's Bay) and Cape Campbell (coastal Marlborough) which remarkably only recorded 3 mm and 4 mm of total rainfall, respectively. In contrast, it was a wet month for western, southern and inland parts of the South Island, with several locations recording 200% or more of normal July rainfall.

**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>				
Reefton	358	212	1960	Highest
Tara Hills	95	246	1949	Highest
Mt Cook Village	565	213	1928	2nd-highest
Manapouri	189	229	1961	2nd-highest
Alexandra	59	249	1983	2nd-highest
Milford Sound	858	203	1929	3rd-highest
Gore	130	226	1950	3rd-highest
Lumsden	81	137	1982	4th-highest
<b>Low records or near-records</b>				
Wairoa	42	31	1964	Lowest
Mahia	3	2	1990	Lowest
Masterton	44	34	1992	2nd-lowest
Castlepoint	19	16	1902	2nd-lowest
Cape Campbell	4	7	1873	3rd-lowest

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## Sunshine: Ample sunshine for many parts of the country.

It was a sunny July in many parts of the country, and nine stations observed record or near-record high sunshine hours for the month. Ashburton and Timaru each observed their sunniest July on record, and Cheviot recorded 158% of normal July sunshine. The prevalence of winds from a westerly direction during the month meant that the Southern Alps acted like a barrier to unsettled weather conditions, such that eastern parts of the South Island observed many clear and sunny days.

Of the available, regularly reporting sunshine observation sites, the sunniest four locations in 2016 so far (1 January – 31 July) were Richmond (1636 hours), Blenheim (1515 hours), New Plymouth (1451 hours) and Takaka (1444 hours).

### Record or near-record July sunshine hours were recorded at:

Location	Sunshine hours	Percentage of normal	Year records began	Comments
High records or near-records				
Ashburton	182	140	1930	Highest
Timaru	191	145	1930	Highest
Balclutha	144	149	1964	2nd-highest
Wellington (Kelburn)	158	132	1928	3rd-highest
Cheviot	165	158	1983	3rd-highest
Queenstown	132	150	1930	3rd-highest
Cromwell	142	144	1979	3rd-highest
Blenheim	191	122	1947	Equal 3rd-highest
Takaka	181	119	1985	4th-highest
Low records or near-records				
None observed				

## July climate in the six main centres

July temperatures were higher than the respective mean temperatures for all main centres. It was a particularly warm month in Auckland where temperatures were well above average for the time of year. It was a dry month for the three southernmost main centres, particularly in Christchurch which received approximately one-third of normal July rainfall. July was a very sunny month in Wellington which observed its third-highest July sunshine total on record, and Christchurch also received abundant sunshine. Of the six main centres in July 2016, Auckland was the warmest, Christchurch was the coolest, driest and sunniest, Tauranga was the wettest, and Dunedin was the cloudiest.

### July 2016 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland <sup>a</sup>	12.2	+1.3	Well above average
Tauranga <sup>b</sup>	10.9	+0.6	Above average
Hamilton <sup>c</sup>	9.0	+0.3	Near average
Wellington <sup>d</sup>	10.1	+1.2	Above average
Christchurch <sup>e</sup>	6.5	+0.7	Above average
Dunedin <sup>f</sup>	7.0	+0.5	Near average
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland <sup>a</sup>	153	111%	Near normal
Tauranga <sup>b</sup>	154	119%	Near normal
Hamilton <sup>c</sup>	152	118%	Near normal
Wellington <sup>d</sup>	68	50%	Below normal
Christchurch <sup>e</sup>	24	37%	Well below normal
Dunedin <sup>f</sup>	41	71%	Below normal
Sunshine			
Location	Sunshine (hours)	% of normal	Comments
Auckland <sup>a</sup>	143	109%	Near normal
Tauranga <sup>b</sup>	132	87%	Below normal
Hamilton <sup>g</sup>	128	102%	Near normal
Wellington <sup>d</sup>	158	132%	Well above normal (3rd-highest on record)
Christchurch <sup>e</sup>	164	129%	Well above normal
Dunedin <sup>f</sup>	122	112%	Above normal

<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

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## Highlights and extreme events

### Rain and slips

Heavy rain on 8 July caused localised flooding in eastern parts of Coromandel and Bay of Plenty. The small Coromandel township of Tairua was temporarily isolated as floodwaters closed SH25 to the north and south. Flooding forced the closure of Opoutere, Hikuai and Waihi Beach schools. State Highway 2 north of Katikati was closed due to flooding, and SH25a east of Kopu was closed due to a slip. Farther north, isolated flash flooding was reported in Warkworth, Leigh and Matakana as thundery rain passed through in the early hours of the morning.

On 13 July heavy rain caused a slip that partially blocked SH6 near Haast. Minor surface flooding was reported on roads near Wanaka. Some inland parts of the South Island received more rainfall on this day than the total they had received in the previous four weeks or more. For example, Tara Hills (near Omarama) recorded 38.6 mm of rainfall – more than the total rainfall recorded there over the previous 46 days.

On 15 July, SH6 was closed from Fox Glacier to Haast due to a slip.

On 19 July, caution was advised on SH6 from Fox River to Punakaiki due to surface flooding.

On 29 July, surface flooding occurred in parts of Auckland's North Shore following thunderstorms.

On 30 July, SH6 from Hawea to Makarora was closed due to a slip.

The highest 1-day rainfall total in July was 225 mm, recorded at North Egmont on 13 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
Alexandra	18	13th	1983	3rd-highest

### Temperatures

On 3 July parts of Waikato observed near-record low daily maximum temperatures. Persistent low cloud and fog contributed to the cool temperatures.

On 23 and 24 July, numerous locations observed record or near-record high daily maximum and minimum temperatures for July. A warm northerly airflow originating from the tropics contributed to the relatively warm temperatures.

The highest July temperature was 22.3°C, observed at Christchurch (Riccarton) on 23 July. The lowest July temperature was -8.7°C, observed at Hanmer Forest on 12 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
High records or near-records				
Hawera	18.2	23rd	1977	Highest



Waiau	21.8	23rd	1974	Highest
Kaikohe	19.1	4th	1973	Equal highest
Waione	20.4	23rd	1991	2nd-highest
Castlepoint	18.4	23rd	1972	2nd-highest
Martinborough	18.8	23rd	1986	2nd-highest
Waipawa	19.8	23rd	1945	2nd-highest
Mahia	19.3	23rd	1990	2nd-highest
Cheviot	21.7	23rd	1982	2nd-highest
Motu	16.5	5th	1990	3rd-highest
Takapau Plains	18.2	23rd	1962	3rd-highest
Dannevirke	19.8	23rd	1951	3rd-highest
Wairoa	21.4	23rd	1964	3rd-highest
Hanmer Forest	19.6	23rd	1906	3rd-highest
Culverden	20.1	23rd	1928	3rd-highest
Christchurch (Riccarton)	22.3	23rd	1863	3rd-highest
Lincoln	20.8	23rd	1881	3rd-highest
Whitianga	19.6	23rd	1962	Equal 3rd-highest
Napier	21.9	23rd	1868	Equal 3rd-highest
Palmerston North	19.2	23rd	1918	Equal 3rd-highest
Whanganui	19.8	23rd	1937	Equal 3rd-highest
Hastings	21.4	23rd	1965	4th-highest
Ranfurly	16.0	23rd	1975	4th-highest
Taupo	16.1	23rd	1949	Equal 4th-highest
<b>Low records or near-records</b>				
Whatawhata	6.9	3rd	1952	Equal 2nd-lowest
Te Kuiti	6.4	3rd	1959	3rd-lowest
Takaka	7.4	31st	1978	4th-lowest
Hamilton	7.0	3rd	1946	Equal 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>				
Auckland (Whenuapai)	14.6	24th	1951	Highest
Waipawa	12.4	24th	1945	Highest
Wairoa	15.8	24th	1972	Highest
Paeroa	14.2	24th	1971	2nd-highest
Taupo	11.1	24th	1950	2nd-highest
Whatawhata	13.5	24th	1952	2nd-highest
Hastings	13.5	24th	1972	2nd-highest
Whangaparaoa	13.7	24th	1982	Equal 2nd-highest
Te Kuiti	12.9	24th	1959	Equal 2nd-highest
Dargaville	14.3	24th	1951	3rd-highest
Auckland (North Shore)	14.7	24th	1994	3rd-highest
Te Puke	13.9	24th	1973	3rd-highest

Whakatane	14.6	24th	1975	3rd-highest
Auckland (Mangere)	14.7	24th	1961	3rd-highest
Hamilton	13.6	24th	1946	3rd-highest
Gisborne	14.4	24th	1940	3rd-highest
Napier	14.5	24th	1940	3rd-highest
Whanganui	13.6	24th	1972	3rd-highest
Puysegur Point	11.9	13th	1978	3rd-highest
Tauranga	14.7	24th	1941	Equal 3rd-highest
Wellington (Airport)	13.1	24th	1972	Equal 3rd-highest
Lumsden	9.3	4th	1982	Equal 3rd-highest
Auckland (Henderson)	13.7	24th	1971	4th-highest
Rotorua	11.7	24th	1972	4th-highest
Pukekohe	13.5	24th	1969	4th-highest
Hamilton (Ruakura)	13.7	24th	1940	4th-highest
Port Taharoa	13.8	24th	1974	Equal 4th-highest
<b>Low records or near-records</b>				
Motu	-8.4	3rd	1990	Lowest
Te Puke	-2.1	2nd	1973	Equal lowest
Kerikeri	-0.3	2nd	1981	2nd-lowest
Lumsden	-8.3	1st	1982	2nd-lowest
Kaitaia	0.6	2nd	1948	3rd-lowest
Warkworth	-1.8	3rd	1966	3rd-lowest

## Wind

On 13 July a bus carrying 30 passengers was blown off the road on SH8 near Burkes Pass. Nelson was hit by strong winds in the evening, and approximately 900 customers lost power in Redwoods Valley, Atawhai and Moutere due to damaged power lines.

On 14 July strong winds brought down trees in Paraparaumu, and farther south near Richmond. Pongakawa (Bay of Plenty) lost power for a time as strong winds damaged power lines.

On 18 July strong southerlies contributed to large swells in Cook Strait. A trailer unit was lost overboard from a Bluebridge ferry crossing when the ferry was struck by a particularly large wave.

On 19 July strong winds brought down several trees and damaged property in Te Awamutu.

On 20 July wind warnings were issued for motorists travelling on the Auckland Harbour Bridge. A strong wind warning was also in place on SH2 from Takapau to Waipukurau.

From 23-25 July, strong wind warnings were in place for SH1 at the Desert Road and SH5 from Napier to Taupo.

On 23 July, 13 people were roped down from a Coronet Peak ski area chairlift (near Queenstown) due to severe wind gusts which meant the chairlift couldn't be operated safely. The ski area was subsequently closed for the remainder of the day.

On 24 July strong winds contributed to stormy seas which hammered coastal parts of Porirua and the Kapiti Coast and caused considerable coastal erosion. Several roads were closed after being engulfed by high seas and breaking waves. In Plimmerton, 10 metres of seawall was washed away. In

Whanganui, strong winds brought down power lines which cut power to 60 homes. Farther north, a carport was blown over in Ngaruawahia, and several homes in rural South Auckland were flooded due to a king tide. Strong winds reportedly brought down trees and power lines in west Auckland, and the South Island's West Coast and Marlborough Sounds. Approximately 180 customers in the Marlborough Sounds were without power due to downed power lines.

On 29 July, motorists travelling on SH5 from Napier to Taupo and on Auckland's Harbour Bridge were warned to take extra care due to strong winds. In Hamilton, a large gum tree was felled by the high winds, as were power lines and other trees across the upper North Island.

On 30 July motorists were warned to take extra care on the Rimutaka Hill road (SH2) and SH2 from Dannevirke to Waipukurau due to strong winds.

The highest wind gust during July was 195 km/hr recorded at Cape Turnagain on 24 July.

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

Location	Extreme wind gust (km/hr)	Date of extreme gust	Year records began	Comments
Paraparaumu	122	24th	1972	Highest
Whanganui	109	24th	1977	Highest
Taupo	91	8th	1982	Equal highest
Castlepoint	145	28th	1972	Equal highest
Rotorua	98	29th	1972	2nd-highest
Westport	109	24th	1973	2nd-highest
Palmerston North	93	24th	1991	Equal 2nd-highest
Levin	104	24th	1971	3rd-highest
Secretary Island	122	13th	1994	3rd-highest
Lauder	117	23rd	1981	3rd-highest
Auckland (North Shore)	76	19th	1994	Equal 3rd-highest
Hawera	102	29th	1986	Equal 3rd-highest
Mt Kaukau (Wellington)	143	24th	1969	4th-highest
Hanmer Forest	89	24th	1995	4th-highest
Kaikohe	80	29th	1986	Equal 4th-highest
Hamilton	83	29th	1978	Equal 4th-highest
Dannevirke	91	24th	1961	Equal 4th-highest
Hokitika	93	24th	1972	Equal 4th-highest

#### Snow and ice

During the first three days of July, heavy frosts were observed in many parts of the country. On 1 July, a number of car accidents in Dunedin were attributed to icy roads, and the runway at Dunedin Airport was closed for a time due to black ice.

On 3 July, police warned motorists to take extra caution in Waikato due to extensive black ice and fog.

On 8 July, a heavy overnight frost in Southland and eastern parts of Otago was followed by light rain in the early hours of the morning, creating widespread issues with black ice. A number of flights at Dunedin Airport were cancelled, and Police reported attending 30 car accidents where ice was a factor in south Otago, Gore and Invercargill.

On 11 July, SH8 was closed from Twizel to Tekapo due to severe ice.

From 12-15 July, SH94 from Te Anau to Milford Sound was closed due to snow.

On 18 July, snow and ice was a contributing factor to a fatal car accident on the Desert Road (SH1).

From 22-25 July, SH 94 from Te Anau to Milford Sound was closed due to snow, avalanche hazard and black ice.

On 24 July, snow fell and settled to around 100 metres above sea level in parts of Southland, with snowfall also reported in the hill suburbs of Dunedin. Motorists were advised to take extra care on SH87 from Outram to Middlemarch, SH8 from Tarras to Omarama and SH96 from Nightcaps to Ohai due to snow. Farther north, SH 73 from Springfield to Otira was closed to towing vehicles due to snow. All other vehicles required chains.

On 26 July, ice on the runway at Invercargill Airport delayed the departure of three early-morning flights.

On 27 July overnight rain in Queenstown was followed by clear skies which resulted in widespread black ice during the morning. Motorists were warned to take extreme care on SH6 between Frankton and Crown Range due to ice, with slippery conditions and several accidents reported on this road and others in the area. The Milford Road (SH94) was closed overnight due to anticipated snowfall, and remained closed until 31 July.

On 28 July, motorists were warned to take extra care on SH6 from Frankton to Lumsden due to icy conditions. Snow had settled on the Glenorchy to Queenstown road west of Bob's Cove.

On 29 and 30 July, SH73 from Arthurs Pass to Otira was closed to towing vehicles due to snow, with chains essential for remaining vehicles. Caution was advised to motorists travelling over the Lindis Pass (SH8) due to snow and black ice. A warning for icy conditions was also in place for SH6 from Hawea to Haast.

On 30 and 31 July, the Crown Range road between Queenstown and Wanaka was closed at times due to snow.

Late on 30 July and into 31 July, snow fell and settled to low levels in the lower South Island and Central Plateau in the North Island. A number of roads were closed due to snow including SH93 from Matakura to Clinton and the Desert Road (SH1). Motorists were warned to take extra care on SH1 from Palmerston to Balclutha, SH97 from Kyeburn to Mosgiel, the Lindis Pass (SH8), SH73 from Springfield to Otira, the Lewis Pass (SH7) and SH6 from Murchison to Wakefield due to snow and ice.

## **Lightning and hail**

In the early hours of 8 July, thunderstorms were reported in northern parts of the North Island, particularly in Auckland. Approximately 1400 lightning strikes were recorded between midnight and 1 a.m.

On 14 July a flight travelling from Wellington to Auckland was struck by lightning. The plane arrived safely in Auckland.

On 28 July, lightning strikes in Taranaki damaged power infrastructure, and resulted in power outages in Strathmore, Hurdon and Omata.

On 31 July, lightning and hail showers were reported in parts of Auckland, with at least 350 households losing power in the suburbs of Glen Eden and Kaukapakapa.

## **Cloud and fog**

On 1 and 2 July, many parts of the Mackenzie Country observed freezing fog which persisted throughout daylight hours. On 2 July, the maximum temperature at Pukaki Airport was just  $-0.8^{\circ}\text{C}$ .

On 3 and 4 July fog caused the cancellation of flights at Hamilton Airport. Fog was also reported in other parts of the North Island including Auckland, Rotorua and Whangarei.

On 6 July, fog caused the cancellation of flights at Auckland Airport.

On 8 July, fog caused the disruption of flights at Whangarei Airport.

On 18 July, flights scheduled to arrive at Invercargill Airport were diverted due to fog, with the return leg of those flights cancelled.

On 22 July heavy fog developed over Christchurch in the evening, causing disruption to flights arriving and departing the city.

On 23 July, several flights in and out of Nelson Airport were cancelled due to poor weather conditions.

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### **For further information, please contact:**

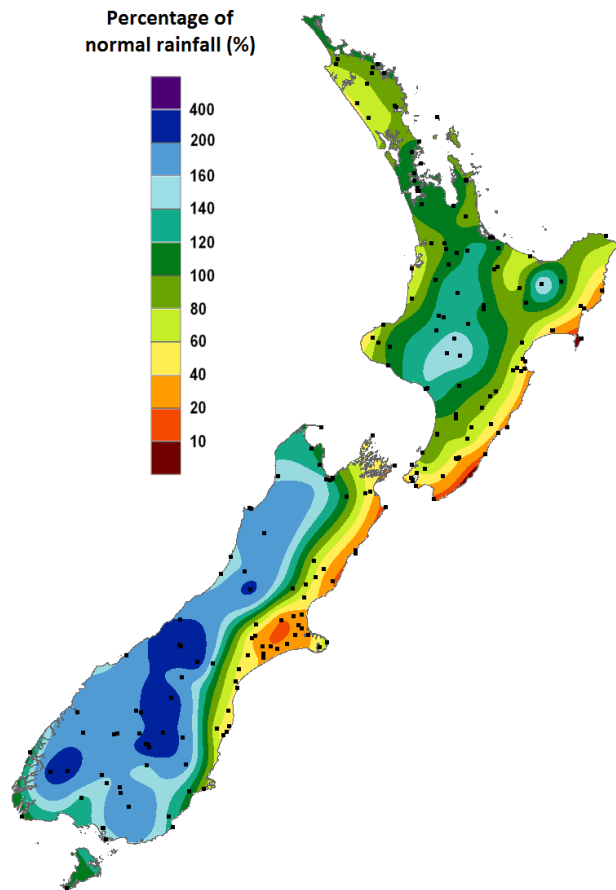
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*July 2016 rainfall, expressed as a percentage of the 1981-2010 normal.*

*It was a dry month for eastern parts of New Zealand, but parts of the South Island observed at least twice as much rainfall as is normal for the time of year (indicated by the dark blue colour on the map).*

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