NIWA National Climate Centre

Seasonal Climate Summary

NIWA Taihoro Nukurangi

New Zealand Climate Summary: **Winter 2015** Issued: 4 September 2015

A winter with many extreme weather events

Temperature	Winter temperatures were below average (-1.20°C to -0.51°C) in pockets of western Waikato, Tararua, Wairarapa, mid-Canterbury, Tasman and coastal Otago. Temperatures were above average (+0.51°C to +1.20°C) in Christchurch, central Otago and the Manawatu and near average elsewhere (-0.50°C to +0.50°C).
Rainfall	Rainfall was below normal (50-79%) or well below normal (< 50%) for some eastern areas of New Zealand including Northland, Bay of Plenty, Gisborne, Hawke's Bay, Wairarapa and north Canterbury. Rainfall was either above normal (120-149%) or well above normal (> 149%) for southwestern and western parts of both the North and South Islands and coastal Otago.
Soil moisture	As of 1 September 2015, soil moisture levels were below normal for this time of year for Hawke's Bay, coastal Wairarapa, eastern parts of Canterbury and North Otago.
Sunshine	Winter sunshine was near normal for most of the country (90-109%). Above normal (110-125%) sunshine was observed in western Waikato and Marlborough and below normal sunshine (75-89%) was observed in Taranaki.

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Overview

Overall, winter temperatures were near average (-0.50°C to +0.50°C) across most of the country. There were pockets of below average temperatures (-1.20°C to -0.51°C) in western Waikato, Tararua, Wairarapa, mid-Canterbury, Tasman and coastal Otago. Pockets of above average temperatures (+0.51°C to +1.20°C) were also present in Christchurch, central Otago and the Manawatu. The nation-wide average temperature in winter 2015 was 8.4°C (equal to the 1981-2010 winter average, using NIWA's seven-station temperature series which begins in 1909)[1]. However, this average picture of winter temperatures does not convey the nature of the extremely low

[1] Interim value.

temperatures that affected the Mackenzie Country and Central Otago in late June. These temperatures were some of the lowest ever recorded in New Zealand and will make winter 2015 one to remember. See the *Highlights and Extreme Events* section for more details on this event.

Pressures were higher than normal over the North Island and lower than normal to the south of New Zealand. This resulted in a westerly to southwesterly flow anomaly for the winter season which was subsequently reflected in the seasonal rainfall anomalies across the country. Specifically, rainfall was below normal (50-79%) or well below normal (< 50%) in eastern parts of both Islands, including Northland, Bay of Plenty, Gisborne, Hawke's Bay, Wairarapa and north Canterbury. In contrast, rainfall was plentiful for many western areas of New Zealand. Rainfall was either above normal (120-149% of winter normal) or well above normal (> 149% of the winter normal) for southwestern and western parts of both the North and South Islands as well as coastal Otago. Rainfall was typically near normal (80-119% of the winter normal) for remaining areas of the country. As of 1 September 2015, soil moisture levels were below normal for this time of year for Hawke's Bay, coastal Wairarapa, eastern parts of Canterbury and North Otago.

Winter sunshine was near normal for most of the country (90-109%). Above normal (110-125%) sunshine was observed in western Waikato and Marlborough, and below normal sunshine (75-89%) was observed in Taranaki.

Winter 2015 saw numerous major snowfall events that closed highways across the South Island and parts of the North Island, as well as causing power outages. The *Highlights and Extreme Events* section has more information on these snowfall events.

Further Highlights:

- The highest temperature was 23.8°C, observed at Christchurch (Riccarton) on 3 August.
- The lowest temperature was -21.0°C, observed at Tara Hills on 24 June.
- The highest 1-day rainfall was 466 mm, recorded at North Egmont 19 June.
- The highest wind gust was 189km/hr, observed at Cape Turnagain on 29 June.
- Of the six main centres in winter 2015, Auckland was the warmest and wettest, Dunedin was the cloudiest, Christchurch was the coolest and driest and Hamilton was the sunniest.
- Of the available, regularly reporting sunshine observation sites, the sunniest four stations so far in 2015 (1 January to 31 August) are: Blenheim (1742 hours), Whakatane (1724 hours), Appleby (1701 hours) and Waipara West (1671 hours).

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Temperature: Near average for most of New Zealand

Winter temperatures were generally near average for most New Zealand locations. Despite the near average temperatures overall, a number of notable polar outbreaks struck during the three-month period which were characterised by extremely low temperatures, low-elevation snowfall and severe frosts (see *Highlights and extreme events* section for further details). The nation-wide average temperature in winter 2015 was 8.4°C (equal to the 1981-2010 winter average, using NIWA's seven-station temperature series which begins in 1909).

Record[2] or near-record mean air temperatures for winter were recorded at:

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Whatawhata	11.0	1.2	1952	4th-highest
Stratford	9.0	0.9	1960	4th-highest
Ranfurly	4.4	1.3	1975	4th-highest
Low records or near-records				
Martinborough	7.8	-0.6	1986	2nd-lowest
Le Bons Bay	7.4	-0.4	1984	3rd-lowest

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Christchurch (Riccarton)	13.6	1.7	1863	Highest
Cromwell	10.9	1.5	1949	2nd-highest
Waiau	13.1	1.3	1974	3rd-highest
Hanmer Forest	12.2	1.1	1906	4th-highest
Low records or near-records				
Martinborough	12.4	-0.7	1986	3rd-lowest

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

Location	Mean minimum	Departure from normal (°C)	Year records began	Comments

[2] 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.

	air temp. (°C)			
High records or near-records				
Whatawhata	7.1	1.5	1952	3rd-highest
Ranfurly	-0.9	1.1	1975	3rd-highest
Low records or near-records				
Timaru	-1.2	-1.2	1885	2nd-lowest
Appleby	0.6	-2.1	1932	2nd-lowest
Waiau	-0.5	-0.4	1974	3rd-lowest
Winchmore	-0.5	-1.9	1928	3rd-lowest
Le Bons Bay	4.6	-0.6	1984	4th-lowest

Rainfall: Wet for western parts but generally dry for the east

Winter 2015 was characterised by a number of heavy rainfall events and flooding, including the worst flooding on record for Whanganui in late June and two months' worth of rainfall in 24 hours for Dunedin in early June. These high rainfall events are seen in the seasonal rainfall records – such as Whanganui receiving its second-highest winter rainfall total on record, in records that extend back to 1890. Notably, Hokitika received over 1 metre of rainfall during winter, its second-wettest winter on record, in records that extend back to 1866. Overall, the west of the country had higher than normal rainfall for winter and the east had lower than normal rainfall for winter. The contrast of higher than normal rainfall in the west and lower than normal rainfall in the east can be attributed to the anomalous westerly to southwesterly airflow throughout the season as a whole.

Record or near-record winter rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
High records or near-records				
Lumsden	244	121	1982	Highest
Hawera	478	142	1977	2nd-highest
Whanganui	420	165	1890	2nd-highest
Hokitika	1101	159	1866	2nd-highest
Stratford	791	133	1960	4th-highest
Lauder	121	161	1924	4th-highest
Gore	299	153	1950	4th-highest
Low records or near-records				
Napier	98	38	1870	2nd-lowest
Toenepi	190	59	1951	4th-lowest
Castlepoint	147	46	1902	4th-lowest

Sunshine: Normal sunshine for most of the country

Although winter sunshine was near normal for most parts of the country, three locations recorded their sunniest winters on record. These measurements can be attributed to these three sites being on the leeward side of New Zealand's high elevation terrain, avoiding the wet and cloudy conditions from weather systems coming from the predominant southwest to west direction.

Record or near-record winter sunshine hours were recorded at:

Location	Sunshine hours	Percentage of normal	Year records began	Comments
High records or near-records				
Blenheim	560	115	1947	Highest
Cheviot	461	141	1983	Highest
Cromwell	464	137	1979	Highest
Te Kuiti	383	124	1962	3rd-highest
Waipawa	472	127	1945	3rd-highest
Taumarunui	348	127	1947	4th-highest
Balclutha	387	133	1964	4th-highest
Low records or near-records				
None recorded				

Winter climate in the six main centres

Temperatures were near average for all main centres in winter 2015. Dunedin received well above normal rainfall, with a significant proportion of the seasonal rainfall attributed to the event on 3 June. In contrast, Tauranga recorded below normal rainfall. Sunshine was above normal in Hamilton, and near normal for the remaining main centres. Of the six main centres in winter 2015, Auckland was the warmest and wettest, Dunedin was the cloudiest, Christchurch was the coolest and driest and Hamilton was the sunniest.

Winter 2015 main centre climate statistics:

Temperature			
Location	**Mean temp. (°C)**	**Departure from normal (°C)**	**Comments**
Auckland[a]	11.9	+0.4	Near average
Tauranga[b]	10.7	0.0	Near average
Hamilton[c]	9.2	-0.1	Near average
Wellington[d]	9.4	+0.1	Near average
Christchurch[e]	6.5	0.0	Near average
Dunedin[f]	6.8	-0.3	Near average
Rainfall			
Location	**Rainfall (mm)**	**% of normal**	**Comments**
Auckland[a]	422	114%	Near normal
Tauranga[b]	277	78%	Below normal
Hamilton[c]	316	84%	Near normal
Wellington[d]	386[3]	98%	Near normal
Christchurch[e]	173	94%	Near normal
Dunedin[f]	279	164%	Well above normal
Sunshine			
Location	**Sunshine (hours)**	**% of normal**	**Comments**
Auckland[a]	431	109%	Near normal
Tauranga[b]	416	90%	Near normal
Hamilton[g]	436	115%	Above normal
Wellington[d]	374	102%	Near normal
Christchurch[e]	397[4]	101%	Near normal
Dunedin[f]	350	107%	Near normal

[a] Mangere [b] Tauranga Airport [c] Hamilton Airport [d] Kelburn [e] Christchurch Airport [f] Musselburgh [g] Ruakura

[3] Missing one day of data
[4] Missing two days of data

Highlights and extreme events

This section contains information pertaining to some of the more significant highlights and extreme events that occurred during winter 2015. Note that a more detailed list of significant weather events for winter 2015 can be found in the *Highlights and extreme events* section of NIWA's monthly Climate Summaries. These monthly summaries are available online, and may be viewed at the following website: http://www.niwa.co.nz/climate/summaries/monthly

Temperatures

Winter 2015 began with higher than normal temperatures in the eastern South Island due to a strong northwest airflow in early June, with Cromwell and Lauder observing their highest June temperatures on record. However, winter 2015 will be remembered for record-low temperatures experienced in late June.

During the nights and early mornings of 23-26 June, record and near record-low temperatures for New Zealand were recorded. A high pressure system combined clear skies with a southerly flow, resulting in very cold temperatures for many parts of the country. In particular, sites in the Mackenzie Country and Central Otago dropped to well below freezing. In the early morning of 23 June, Lake Pukaki recorded -19.8°C. A number of other sites also recorded temperatures below -10°C. New Zealand's coldest temperature on record is -25.6°C, recorded in Ranfurly, Central Otago, on 17 July 1903. During the second night of very cold temperatures on 24 June, Tara Hills, a climate station near Omarama, recorded a low temperature of -21.0°C, which is the lowest temperature officially recorded in New Zealand in 20 years (excluding high altitude stations). This temperature is also the fourth-lowest temperature ever recorded in New Zealand (excluding high altitude stations). Overnight on 24-25 June, for the third night in a row, temperatures in the central South Island plunged to well below freezing. Tara Hills recorded -19.7°C and Lake Pukaki observed -16.3°C. Temperatures remained well below freezing for the central South Island overnight on 25-26 June. Omarama recorded -15°C and Pukaki recorded -12°C.

During this period, three out of the 10 lowest temperatures ever recorded in New Zealand were experienced (excluding high elevation alpine sites). For more information on the weather conditions that produced these low temperatures, refer to the June climate summary (link above).

From 9 July a high pressure system gradually became established over New Zealand, bringing widespread frosty conditions which were severe in many areas. The high remained in place until 14 July, and over the course of these six days 18 locations observed record or near-record low minimum temperatures for July. A very cold southerly airflow preceding the high pressure system contributed to numerous locations observing record or near-record low daily maximum temperatures for July.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Kaitaia	20.8	Jun-2nd	1985	Highest
Taihape	19.5	Jun-2nd	1972	Highest
Christchurch (Riccarton)	23.8	Aug-3rd	1863	Highest
Lumsden	18.8	Jun-9th	1982	Equal highest
Paraparaumu	20.0	Jun-2nd	1953	2nd-highest
Reefton	19.0	Jun-2nd	1960	2nd-highest
Lauder	21.0	Jun-9th	1924	2nd-highest
Nugget Point	18.2	Jun-9th	1970	2nd-highest
Mana Island	18.0	Jun-2nd	1987	Equal 2nd-highest
Ranfurly	18.6	Jun-9th	1975	Equal 2nd-highest
Leigh	21.4	Jun-1st	1966	3rd-highest
Auckland (Whenuapai)	21.1	Jun-2nd	1945	3rd-highest
Cromwell	21.0	Jun-9th	1949	3rd-highest
Ophir	20.3	Jun-9th	1924	3rd-highest
Winton	20.0	Jun-9th	1951	3rd-highest
Gore	18.2	Jun-9th	1971	3rd-highest
Tiwai Point	17.8	Jun-9th	1970	3rd-highest
Queenstown	19.6	Jun-9th	1871	Equal 3rd-highest
Wanaka	17.7	Jun-9th	1955	4th-highest
Alexandra	21.2	Jun-9th	1983	4th-highest
Auckland (Mangere)	20.7	Jun-2nd	1959	Equal 4th-highest
Wanganui	21.1	Jun-1st	1937	Equal 4th-highest
Dunedin	20.6	Jun-9th	1947	Equal 4th-highest
Low records or near-records				
Kaitaia	10.1	Jul-10th	1985	Lowest
Waione	4.9	Jul-9th	1993	Lowest
Wairoa	6.4	Jul-9th	1972	Lowest
Le Bons Bay	3.0	Aug-9th	1984	Lowest
Tara Hills	-9.0	Jun-24th	1949	Lowest
Tautuku	3.0	Jul-6th	1976	Lowest
Hicks Bay	8.1	Jul-8th	1972	Equal lowest
Kaitaia	9.6	Jul-10th	1971	2nd-lowest
Motu	3.8	Jul-8th	1990	2nd-lowest
Port Taharoa	8.7	Jul-8th	1974	2nd-lowest
Te Kuiti	6.3	Jul-9th	1959	2nd-lowest
Dannevirke	4.0	Jul-9th	1951	2nd-lowest
Waipawa	4.5	Jul-9th	1945	2nd-lowest
Taihape	4.0	Jul-9th	1972	2nd-lowest
Secretary Island	5.9	Jul-6th	1989	Equal 2nd-lowest
Wanaka	-1.0	Jun-24th	1972	Equal 2nd-lowest
Dunedin	3.9	Jun-22nd	1947	Equal 2nd-lowest

Dargaville	9.4	Jul-9th	1951	3rd-lowest
Whangaparaoa	9.7	Jul-9th	1982	3rd-lowest
Takapau Plains	3.8	Jul-9th	1972	3rd-lowest
Ngawi	6.9	Jul-8th	1972	3rd-lowest
Hastings	6.6	Jul-9th	1972	3rd-lowest
Cape Reinga	10.8	Jul-10th	1971	Equal 3rd-lowest
Castlepoint	6.5	Jul-8th	1972	Equal 3rd-lowest
Kaitaia	10.2	Jul-10th	1948	4th-lowest
Whitianga	9.8	Jul-9th	1971	4th-lowest
Te Puke	8.6	Jul-8th	1973	4th-lowest
Gisborne	6.9	Jul-9th	1940	4th-lowest
Warkworth	9.8	Jul-9th	1966	Equal 4th-lowest

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
Low records or near-records				
Tara Hills	-21.0	Jun-24th	1949	Lowest (4th lowest NZ temperature)
Waione	-5.5	Jul-14th	1991	Lowest
Greymouth	-2.6	Jul-9th	1947	Lowest
Okarito	-4.4	Jul-5th	1982	Lowest
Franz Josef	-5.0	Jul-10th	1982	Lowest
Appleby	-11.0	Jun-24th	1932	Lowest
Auckland (Ardmore)	-4.0	Jul-12th	1969	Equal lowest
Martinborough	-4.3	Jul-14th	1986	Equal lowest
Te Kuiti	-4.9	Jul-13th	1959	2nd-lowest
Takapau Plains	-5.4	Jul-14th	1962	2nd-lowest
Mahia	1.8	Jul-9th	1990	2nd-lowest
Lake Tekapo	-15.0	Jun-24th	1925	2nd-lowest
Alexandra	-9.8	Jul-12th	1992	2nd-lowest
Kaitaia	0.4	Jul-12th	1948	3rd-lowest
Kerikeri	-0.7	Jul-12th	1981	3rd-lowest
Warkworth	-2.3	Jul-12th	1966	3rd-lowest
Lake Tekapo	-14.5	Jun-23rd	1925	3rd-lowest
Le Bons Bay	-0.1	Aug-8th	1984	Equal 3rd-lowest
Arthurs Pass	-10.0	Jun-23rd	1978	4th-lowest
Orari Estate	-7.3	Jul-13th	1972	4th-lowest
Timaru	-7.7	Jun-24th	1885	4th-lowest
Balclutha	-6.1	Jul-13th	1964	4th-lowest
Port Taharoa	0.9	Jul-10th	1973	Equal 4th-lowest
Secretary Island	0.9	Jul-7th	1985	Equal 4th-lowest
Naseby Forest	-9.4	Jun-24th	1983	Equal 4th-lowest
Stewart Is	-3.2	Jul-14th	1975	Equal 4th-lowest
High records or near-records				
Masterton	13.8	Jun-20th	1992	Highest

Stratford	13.4	Jun-20th	1972	Highest
Reefton	11.2	Jun-10th	1972	Highest
Puysegur Point	13.2	Jun-9th	1978	Highest
Wanaka	10.9	Jun-9th	1972	Highest
Thames	16.2	Jun-20th	1957	2nd-highest
Paeroa	15.4	Jun-20th	1971	2nd-highest
Napier	16.1	Jun-20th	1940	2nd-highest
Hastings	15.1	Jun-20th	1972	2nd-highest
Waiouru	10.0	Jun-20th	1972	2nd-highest
Taihape	12.0	Jun-20th	1973	2nd-highest
Blenheim	14.8	Jun-10th	1972	2nd-highest
Ranfurly	10.7	Jun-9th	1975	2nd-highest
Cromwell	12.6	Jun-9th	1949	2nd-highest
Tautuku	10.5	Jun-9th	1976	2nd-highest
Kaikohe	15.6	Jun-20th	1973	3rd-highest
Wellington	14.5	Jun-10th	1972	3rd-highest
Wanganui	14.1	Aug-4th	1972	3rd-highest
Waipara West	14.6	Aug-4th	1973	3rd-highest
Manapouri	10.3	Jun-9th	1973	3rd-highest
Whangarei	16.2	Jun-20th	1967	Equal 3rd-highest
Whangaparaoa	15.0	Jun-20th	1982	Equal 3rd-highest
Kaikoura	12.9	Jun-10th	1972	Equal 3rd-highest
Kerikeri	15.8	Jun-20th	1981	4th-highest
Dargaville	15.7	Jun-20th	1951	4th-highest
Auckland (North Shore)	15.3	Jun-20th	1994	4th-highest
Blenheim	14.0	Jun-10th	1947	4th-highest
Grassmere	14.2	Jun-10th	1972	4th-highest
Culverden	13.2	Aug-4th	1930	4th-highest
Le Bons Bay	12.6	Jun-10th	1984	4th-highest
Ngawi	15.0	Jun-10th	1972	Equal 4th-highest
Lauder	11.6	Jun-9th	1924	Equal 4th-highest

Rain and slips

On 3 June, Dunedin was inundated by very heavy and prolonged rainfall, which resulted in significant flooding, loss of electricity, evacuations and road closures throughout the city and nearby areas. The worst-hit areas included low lying coastal areas, Kaikorai Valley, Brighton, Mosgiel and North East Valley. Dozens of road closures were enforced: most notably the southern motorway (SH1) was mostly down to one lane in each direction, with all northbound lanes closed from Abbotsford to Kaikorai Valley. The Fire Service responded to 345 events, with the vast majority of those in the South Dunedin area, and a Mayoral Fund was established to help flood-affected residents. Numerous locations in and around Dunedin received their highest 1-day rainfall totals on record for winter during this event.

Overnight on 18-19 June, torrential rain in Hokitika caused significant flooding and many people, including 20 retirement home residents, were evacuated. 211 mm of rain fell in Hokitika in the 24

hours to 9 am on 19 June – its highest 1-day rainfall total for winter on record, in records which began in 1866.

The worst flood on record for Whanganui occurred over 20-21 June, and a state of emergency was declared. On 20 June, heavy rain continued for the Kapiti Coast, Wairarapa, Manawatu and Whanganui areas, causing widespread slips, flooding, and road closures. Numerous highways in the region were closed due to flooding. Because parts of SH 1 and SH 3 were closed, motorists travelling to and from Wellington needed to drive through the Wairarapa region. More than 100 households in Whanganui were evacuated on the 20th, mostly on the eastern banks of the Whanganui River, with hundreds more self-evacuating. The Whanganui River breached its banks around midnight on the 20th, spilling floodwaters into Whanganui's CBD. All bridges over the river were closed except for Cobham Bridge. SH 3, both north and south of the city, and SH 4 were closed. There were power outages in some parts of the city, and outages to about half of the 24 pump stations. During this event, numerous sites recorded their highest 1-day rainfall totals on record for winter.

On 21 June, Whanganui was cut off by road. A state of emergency was also declared in Rangitikei and Taranaki after heavy rainfall and flooding in those regions. In the South Taranaki township of Waitotara, sixty households were evacuated, as well as four families from Waitotara Valley. The Army evacuated the isolated village of Koitiata in Rangitikei. Residents of Turakina Beach were trapped due to floodwaters, as were a number of people in Whangaehu. On 22 June, over 300 people in the Taranaki and Whanganui regions remained evacuees from the floods. States of emergency remained in place in the regions.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Baker Road, New Plymouth	116	Jul-28th	1990	Highest
Lake Mangamahoe	145	Jun-19th	1971	Highest
North Egmont	466	Jun-19th	1981	Highest
Te Rehunga	91	Jun-20th	1954	Highest
Putara	211	Jun-19th	1917	Highest
Dannevirke	75	Jun-20th	1951	Highest
Waituna	71	Jun-20th	1984	Highest
Greatford	80	Jun-19th	1978	Highest
Te Horo, Jonelle	96	Jun-19th	1992	Highest
Manakau	129	Jun-19th	1974	Highest
Te Horo, Longcroft	94	Jun-19th	1969	Highest
Raetihi	84	Jun-19th	1979	Highest
Oxton	85	Jun-20th	1950	Highest
Wanganui	79	Jun-19th	1937	Highest
Ngahere Iti	73	Jun-20th	1961	Highest
Hokitika Airport	211	Jun-18th	1866	Highest
Kokiri, Maori Gully Road	181	Jun-18th	1980	Highest

Inchbonnie	328	Jun-18th	1949	Highest
Kowhitirangi	265	Jun-18th	1965	Highest
Lower Whataroa	275	Jun-18th	1949	Highest
Lake Coleridge	119	Jun-19th	1911	Highest
Naseby Forest	57	Jun-3rd	1983	Highest
Lee Flat	76	Jun-3rd	1954	Highest
Balmoral	95	Jun-3rd	1948	Highest
Mosgiel	146	Jun-3rd	1952	Highest
Dunedin (Balaclava)	177	Jun-3rd	1976	Highest
Powder Creek	138	Jun-3rd	1993	Highest
Dunedin Botanical Gardens	173	Jun-3rd	1913	Highest
Maungatua	80	Jun-3rd	1970	Highest
Dunedin Airport	87	Jun-3rd	1962	Highest
Southern Reservoir	165	Jun-3rd	1967	Highest
Green Island	160	Jun-3rd	1993	Highest
Glenledi Rd	93	Jun-3rd	1984	Highest
Rosebank	33	Jun-3rd	1984	Highest
Hillend	95	Jun-3rd	1967	Highest
Lower Retaruke	93	Jun-19th	1974	2nd-highest
Kiritaki	91	Jun-20th	1971	2nd-highest
Palmerston North	90	Jun-20th	1928	2nd-highest
Bainesse	74	Jun-19th	1974	2nd-highest
Opiki	74	Jun-19th	1945	2nd-highest
Reikorangi	87	Jun-19th	1969	2nd-highest
Patiki	80	Jun-19th	1963	2nd-highest
Stratford	127	Jun-19th	1960	2nd-highest
Ross	189	Jun-18th	1909	2nd-highest
Greymouth	149	Jun-18th	1947	2nd-highest
Paroa	145	Jun-18th	1964	2nd-highest
Okarito	165	Jun-18th	1981	2nd-highest
Glenthorne	87	Jun-20th	1985	2nd-highest
Hororata	82	Jun-18th	1890	2nd-highest
Long Beach	88	Jun-3rd	1979	2nd-highest
Dunedin (Musselburgh)	113	Jun-3rd	1918	2nd-highest
Ettrick	30	Jun-3rd	1950	2nd-highest
Tima	26	Jun-22nd	1990	2nd-highest
Balclutha	76	Jun-3rd	1949	2nd-highest
Inchclutha	70	Jun-3rd	1967	2nd-highest
Nugget Point	50	Jun-3rd	1930	2nd-highest
Waipuna	82	Jun-20th	1924	3rd-highest
Castlepoint Station	64	Jun-20th	1994	3rd-highest
Sanson, Ngahere	75	Jun-19th	1973	3rd-highest
Feilding Sandon Rd	70	Jun-20th	1882	3rd-highest
Levin Aws	63	Jun-19th	1949	3rd-highest
Riverlea	101	Jun-19th	1913	3rd-highest
Hunterville	71	Jun-20th	1950	3rd-highest
Lake Tekapo	62	Jun-18th	1976	3rd-highest

Roxburgh	43	Jun-3rd	1946	3rd-highest
Waikawa Valley	83	Jun-3rd	1970	3rd-highest
Tarata	105	Jun-20th	1951	4th-highest
Makairo	62	Jun-20th	1968	4th-highest
Waikanae	72	Jun-19th	1969	4th-highest
Tapawera	56	Jun-1st	1992	4th-highest
Brandy Creek	69	Jun-1st	1985	4th-highest
Pelorus Sound	85	Jun-18th	1982	4th-highest
Kimbell	87	Jun-18th	1971	4th-highest
Hindon	68	Jun-3rd	1973	4th-highest
Lauder	34	Jun-3rd	1924	4th-highest
Lauder Flat	38	Jun-18th	1945	4th-highest
Waiwera	30	Jun-3rd	1954	4th-highest
Tautuku	41	Jun-3rd	1976	4th-highest

Wind

On 9 June, strong winds toppled trees and affected flights in and out of Queenstown Airport. In Wellington, strong winds caused two shipping containers to fall into the harbour, one of which later washed up at Oriental Bay Beach. Power was cut to nearly 2000 homes in Wellington due to high winds. In north Canterbury, a wildfire covering approximately 50 hectares was fanned by strong winds, making it difficult for fire services to control.

On 14 and 15 June, massive waves slammed into Wellington's south coast, washing debris over roads and inundating properties at Lyall Bay and trapping people in their car at Cape Palliser. The large waves, up to 4m in size, were a product of a low pressure system sitting east of New Zealand that had pushed a strong southwest flow up the country. In Dunedin, large waves washed away supporting poles of the ramp down to St Clair Beach, and claimed the life of a Jack Russell dog.

On 18 July, approximately 9000 customers in Northland, Auckland, Coromandel Peninsula and Bay of Plenty were without power as a result of strong winds causing trees to fall onto power lines. The strong winds tore off roofs, smashed boats into sea walls and twisted traffic lights in parts of Auckland, and numerous trees were felled. One family was evacuated from their west Auckland home after wind brought a tree down on their house. At Ardmore Airport in Auckland, two light aircraft were flipped upside down by the wind. Water spouts and mini tornadoes were reported farther south at Mount Maunganui.

Record or near record winter extreme wind gusts were recorded at:

Location	Extreme wind gust (km/hr)	Date of extreme gust	Year records began	Comments
Puysegur Point	148	Jun-9th	1986	2nd-highest
South West Cape	167	Jun-9th	1991	2nd-highest
Secretary Island	128	Jul-25th	1994	Equal 2nd-highest
Turangi	95	Jun-13th	1973	Equal 3rd-highest
Palmerston North	89	Jun-12th	1991	Equal 3rd-highest

Blenheim	102	Jun-29th	1972	Equal 3rd-highest
Tara Hills	95	Jun-18th	1985	Equal 3rd-highest
Wanganui	98	Jun-12th	1977	4th-highest
Tauranga	96	Jul-18th	1973	Equal 4th-highest

Snow and ice

From 18 to 28 June, a weather system bringing snowfall and very cold temperatures affected the South Island. On 18 June, heavy snow fell across Otago and inland Canterbury. Some schools in Queenstown and across the Central Otago region were closed due to the weather conditions. The Remarkables ski field in Queenstown postponed its opening day as the bad weather meant that contractors were unable to carry out work ahead of the opening day. Some flights in and out of Queenstown airport were delayed or cancelled due to the weather. A number of highways across the South Island were closed overnight from 18-19 June. On 19 June, the snow storm was still affecting Canterbury, with Mt Hutt ski field closed due to very high avalanche risk (they reported 1.2 m of new snow over two days), schools closed around Geraldine, Fairlie and Pleasant Point, and power out to over 4500 homes in the region (including the townships of Darfield, Hororata, Coalgate, Sheffield, Springfield, Lake Coleridge, Kirwee and Glentunnel). Two Spark cellphone towers in Fairlie also lost power. The Hermitage Hotel in Mt Cook Village lost power, and around 1 m of snow was reported in Mt Cook Village. Vehicle restrictions and cautions were in place for many State Highways in Canterbury and Otago, and this continued for a number of days.

From 23 to 29 June, extremely cold temperatures (covered above in the *Temperatures* section) caused black ice and dangerous driving conditions. Motorists were warned about black ice and snow on many South Island highways. Numerous crashes, along with one fatal crash, were caused by the black ice.

From 6-10 July, snow affected much of the South Island and central to lower North Island. On 6-7 July, the Milford Road (SH 94) was closed due to snow and avalanche danger. Chains were essential for vehicles travelling on SH 73 between Arthur's Pass and Otira. Caution was required on highways in Canterbury due to snow and ice. In Queenstown, morning flights were delayed after overnight precipitation froze on the runway, and a car rolled on black ice. On 7 July snow showers continued to fall to low levels in parts of the South Island. Some highways were closed, and motorists were warned to take extra care on numerous other highways across the South Island due to snow and ice. On 8 July snow showers persisted in southern and eastern parts of the South Island, and began to affect areas of the North Island. Snow fell to sea level in parts of Southland, while a few centimetres of snow settled in the hill suburbs of Dunedin, to lake level in Queenstown, and on the Port Hills near Christchurch. Numerous roads throughout Southland and Otago were affected by snow and black ice and many accidents were reported in both regions. In the North Island, the Rimutaka Hill Road (SH 2) and the Napier to Taupo Highway (SH 5) were closed due to snow, while caution was required on the Desert Road (SH 1) and SH 1 north of Taupo. A ski patroller both triggered and was partially buried by a size 1 avalanche at Turoa skifield. On 9 July cold southerlies continued over the country, with snow showers falling to low elevations in eastern parts of the South Island north of the Rakaia River, and throughout many central and southern parts of the North Island. Light snow fell and settled in the higher hill suburbs of Wellington, and the Rimutaka Hill Road (SH 2) was again closed due to snow. The Desert Road was also closed due to snow, and caution was advised to

motorists travelling on SH 2 between Gisborne and Wairoa due to snow and ice. On 10 July snow had settled to approximately 700 m above sea level on the Waima Ranges in Northland (southwest of Kaikohe). SH 2 from Wairoa to Gisborne and from Matawai to Otoko (between Gisborne and Opotiki) was closed due to snow. A number of inland North Island roads were also closed by snow.

Lightning and hail

On 9 August, hail showers were experienced in Auckland and other parts of the central North Island. Caution was advised on SH 2 at the Karangahake Gorge near Waihi, as the hailstorms had left slippery ice on the road.

On 10 August, soft hail known as graupel fell around the Auckland region, covering some areas in a blanket that resembled snow. Impressive lightning displays were observed in some areas, and thunder booms shook houses.

Cloud and fog

On 6 June, fog caused flight delays and diversions at Auckland Airport.

On 23 and 25 July, flights at Auckland Airport were disrupted by fog.

On 2 August, thick fog rolled into Nelson and cancelled flights.

On 31 August, heavy fog in Auckland caused one domestic flight to be cancelled and 7 to be delayed.

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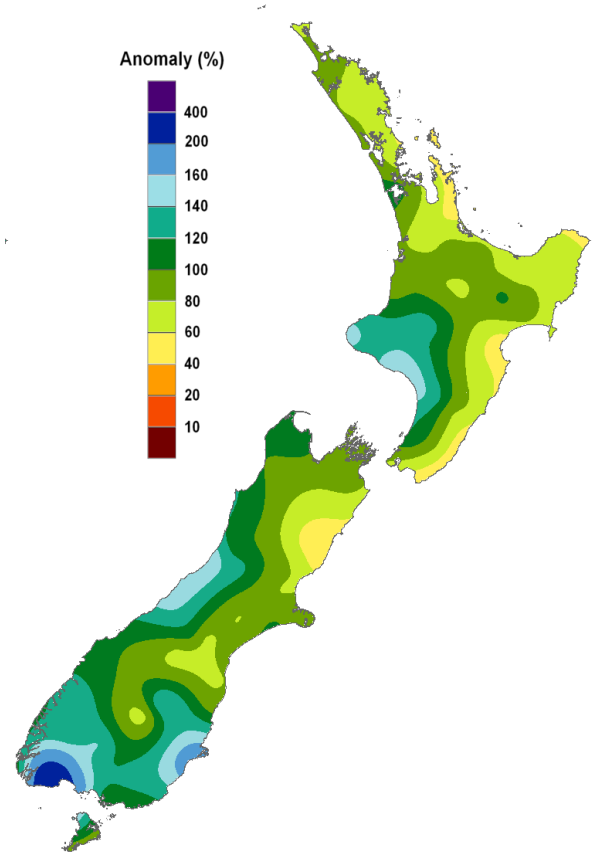

Winter 2015 total rainfall, expressed as a departure from the 1981-2010 average (%).

Many western and southern areas of New Zealand observed above normal rainfall (120-149% of the winter normal) or well above normal rainfall (> 149% of the winter normal) as indicated by the blue shades. Eastern areas received below (50-79% of winter normal) or well below (< 50% of winter normal) normal rainfall as indicated by the yellow shades.

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