

## A dry month for the South Island with warm and wet conditions in the North.

<b>Rainfall</b>	Below normal (50-79%) rainfall was recorded for much of the South Island with pockets of well below normal (< 50%) rainfall observed in some locations. Conversely, above normal (120-149%) September rainfall occurred in several North Island regions including parts of Auckland, Bay of Plenty, Gisborne, Hawke's Bay, Manawatu-Whanganui and Taranaki.
<b>Temperature</b>	A mild September for the majority of the North Island and parts of the West Coast. Below average temperatures (-1.20 to -0.51°C) for much of coastal Otago and close to average (within 0.50°C of average) temperatures elsewhere.
<b>Soil Moisture</b>	As of 1 October, 2014 soil moisture levels on the east coast of the South Island were below normal for the time of year, while levels for the remainder of the South Island were near normal. Soil moisture levels in the North Island were at field capacity and were slightly wetter than normal in the Hawke's Bay.
<b>Sunshine</b>	A sunny September for the South Island with above normal (110-125%) sunshine recorded. Near normal (90-109%) sunshine for the North Island, Marlborough and Nelson.

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### Overview

September 2014 was characterised by lower pressures than normal over the north-east of the country and higher pressures well to the west of New Zealand. This pressure pattern brought about more south-easterly flows across northern New Zealand.

A long reigning dry spell in many parts of the South Island began in mid-August and persisted into the first half of September, contributing to the south experiencing a dry September as a whole. Overall, rainfall was largely below normal (50-79%) for the Island and well below normal (< 50%) in parts of the Queenstown Lakes district. Conversely, rainfall was above normal (120-149%) in several North Island regions including parts of Auckland, Bay of Plenty, Gisborne, Hawke's Bay, Manawatu- Whanganui and

Taranaki. Rainfall was generally in the near normal range for the remainder of the North Island as well as the Tasman and Nelson regions of the South Island.

Soil moisture levels were slightly lower than normal along the West Coast, Tasman and Taranaki at the start of the month and have become drier this month due to lack of significant rain. While soil moisture along the West Coast began to slightly replenish from 12 September onwards, drier conditions in the east of the Island sparked the rapid depletion of soil moisture levels during the second half of September. As of 1 October, 2014 soil moisture levels on the east coast of the South Island were below normal for the time of year, while levels for the remainder of the South Island are near normal. Soil moisture levels in the North Island were at field capacity and were slightly wetter than normal in the Hawke's Bay as a result of the abundant rainfall in the region during September.

It was a mild September for Auckland, Waikato, Bay of Plenty, Manawatu-Wanganui, Taranaki and parts of the West Coast with above average (0.51 to 1.20°C) temperatures recorded. It was particularly warm in the north of the South Island on September 24th, when higher pressures and a north easterly flow brought about near-record high temperatures at several locations. Coastal Otago was not as warm during September and was characterised by below average temperature (-1.20 to -0.51°C). Generally near normal temperature was experienced elsewhere. The nation-wide average temperature in September 2014 was 10.9°C (0.50°C above the 1971-2000 September average from NIWA's seven station temperature series which begins in 1909)<sup>1</sup>.

It was a sunny start to spring for most of the South Island, reflecting the dryness experienced during September. Several stations in the south received near-record sunshine hours, with Queenstown enjoying its highest September sunshine total on record following on from the sunniest August last month. The North Island along with Nelson and Marlborough were not as bright in September and received near normal (90-109%) sunshine levels.

#### **Further Highlights:**

- The highest temperature was 24.1°C, observed at Leeston on 11 September.
- The lowest temperature was -6.9°C, observed at Middlemarch on 28 September.
- The highest 1-day rainfall was 113.6 mm, recorded at Lake Moeraki on 12 September.
- The highest wind gust was 170 km/hr, observed at Cape Turnagain on 26 September.
- Of the six main centres in September 2014, Auckland was the warmest, Christchurch was the coldest and driest, Hamilton was the cloudiest and wettest and Dunedin was the sunniest.
- Of the available, regularly reporting sunshine observation sites, the sunniest four centres<sup>2</sup> so far in 2014 (January to September) are: Whakatane (1992 hours), Lake Tekapo (1792 hours) Tauranga (1786 hours) and Nelson (1750 hours).

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<sup>1</sup> Interim value

<sup>2</sup> New Plymouth sunshine is still omitted from this ranking while recent instrumentation changes are assessed.

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## Rainfall: Dry in the South and wet in parts of the North

September as a whole was a dry month for the South Island with below normal (50-79%) rainfall recorded for much of the Island. Persistent highs to the west of the country contributed to a long-lasting dry spell which began in mid-August and extended into the first half of September, affecting many areas of the south as well as Southern Taranaki and Whanganui. Although there was some reprieve from the dryness during the second half of September, rainfall totals for the month were still well below normal (< 50%) in several locations including Wanaka, Ranfurly and Queenstown.

Conversely, more frequent south-easterly winds over the North Island brought plenty of rain to the Bay of Plenty, Gisborne and Hawke's Bay regions. For the month as a whole, well above normal (> 149%) rainfall was recorded in Whakatane and Napier alongside near-record rainfall totals in Motu, Hawera and Mahia (177%, 175% and 173% of normal respectively). Above normal (120-149%) rainfall was also experienced in the Auckland, South Taranaki and Whanganui regions. Rainfall was generally in the near normal range for the remainder of the North Island as well as the Tasman and Nelson regions of the South Island.

Soil moisture levels were slightly lower than usual along the West Coast, Tasman and Taranaki at the start of the month and continued to fall due to the persistence of dry conditions. While soil moisture along the West Coast began to slightly replenish from 12 September onwards, drier conditions in the east of the Island sparked the rapid depletion of soil moisture levels during the second half of September. As of 1 October, 2014 soil moisture levels on the east coast of the South Island were below normal for the time of year, while levels for the remainder of the South Island were near normal. Soil moisture levels in the North Island were at field capacity and were slightly wetter than normal in the Hawke's Bay as a result of the abundant rainfall in the region during September.

### Record <sup>3</sup>or near-record September rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
High records or near-records				
Motu	352	177	1990	3rd-highest
Hawera	165	175	1977	3rd-highest
Auckland (Airport)	175	193	1959	4th-highest
Mahia	113	173	1990	4th-highest
Low records or near-records				
South West Cape	54	49	1991	3rd-lowest
Campbell Island	82	70	1992	4th-lowest

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<sup>3</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.

## Temperature: A mild September for the North Island and largely average temperatures in the South

It was a mild September for Auckland, Waikato, Bay of Plenty, Manawatu-Whanganui, Taranaki and parts of the West Coast, with above average (0.51 to 1.20°C) temperatures recorded. Pockets of well above average temperature (>1.20°C) were recorded in Te Puke, Tauranga, Stratford and Masterton. Warm nights were felt in both Te Puke and Masterton where mean minimum temperatures in September were the warmest on record.

Mean temperatures were not as balmy along the east coast of Otago, registering as below average (-1.20 to -0.51°C) at several locations. Most notably, the mean minimum temperature of 1.5°C recorded at Dunedin Airport was the lowest on record (records began in 1962). Mean temperatures were generally in the near normal range elsewhere. Interestingly, despite the near normal mean temperatures in Southland as well as the Queenstown Lakes and Central Otago districts, mean maximum temperatures were above normal and mean minimum temperatures were below normal at several locations including Queenstown, Cromwell and Invercargill. This coincides with the high sunshine hours in the area indicating plenty of sunny days and clear, cool nights. The nation-wide average temperature in September 2014 was 10.9°C (0.50°C above the 1971-2000 September average from NIWA's seven station temperature series which begins in 1909).

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

Location	Mean air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Te Puke	13.6	1.8	1973	Highest
Stratford	11.2	1.6	1960	Highest
Masterton	11.8	1.5	1992	2nd-highest
Tauranga	13.7	1.3	1913	3rd-highest
Kaikohe	13.5	1.2	1973	4th-highest

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

Location	Mean maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Wallaceville	16.5	1.8	1939	Highest
Mt Cook	14.7	2.9	1929	Highest
Westport	15.4	1.2	1937	2nd-highest
Reefton	16.5	1.9	1960	2nd-highest
Stratford	15.2	1.5	1960	3rd-highest
Milford Sound	14.7	1.4	1934	3rd-highest
Ranfurly	15.1	2.0	1975	3rd-highest
Te Puke	17.9	1.2	1973	4th-highest
Nelson	16.3	1.3	1943	4th-highest
Cheviot	15.4	0.3	1982	4th-highest
Motueka	17.4	1.7	1956	Equal 4th-highest

Low records or near-records				
Kaitaia	16.1	-0.8	1967	4th-lowest
Le Bons Bay	11.6	-0.8	1984	4th-lowest

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

Location	Mean minimum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
High records or near-records				
Te Puke	9.4	2.6	1973	Highest
Masterton	6.8	2.5	1992	Highest
Dargaville	10.5	0.9	1943	2nd-highest
Paeroa	9.1	1.4	1947	2nd-highest
Stratford	7.2	1.7	1960	2nd-highest
Kaitaia (Observatory)	10.6	1.1	1985	4th-highest
Kaikohe	10.4	1.4	1973	4th-highest
Farewell Spit	9.5	1.3	1971	4th-highest
Low records or near-records				
Dunedin (Airport)	1.5	-1.5	1962	Lowest
Winchmore	1.2	-2.6	1928	2nd-lowest

## Sunshine: A sunny September in the South Island

It was a sunny start to spring for most parts of the South Island, reflecting the dryness experienced during September. Several stations in the south received near record sunshine hours, with Queenstown enjoying its highest September sunshine total on record following on from the sunniest August last month. Dunedin also experienced high sunshine hours in September, with the associated clear nights contributing to their lowest mean minimum temperature on record mentioned prior. The North Island, along with Nelson and Marlborough, were not as bright in September and received near normal (90-109%) sunshine levels.

Of the available, regularly reporting sunshine observation sites, the sunniest four centres so far in 2014 (January to September) are: Whakatane (1992 hours), Lake Tekapo (1792 hours) Tauranga (1786 hours) and Nelson (1750 hours).

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

Location	Sunshine hours	Percentage of normal	Year records began	Comments
High records or near-records				
Queenstown	246	161	1930	Highest
Cheviot	216	150	1983	2nd-highest
Cromwell	237	131	1979	2nd-highest
Balclutha	193	141	1964	2nd-highest
Dunedin	193 <sup>4</sup>	143	1980	3rd-highest <sup>4</sup>
Mt Cook	167	138	1930	4th-highest

<sup>4</sup> Missing data on 1 September

## September climate in the six main centres

September temperatures were above average for the four North Island main centres, below average in Christchurch and near average in Dunedin. Monthly rainfall totals ranged from below normal in Christchurch to 140% of normal in Hamilton. Sunshine was in the near normal range for the main centres with the exception of Wellington, where above average sunshine was recorded. Of the six main centres in September 2014, Auckland was the warmest, Christchurch was the coldest and driest, Hamilton was the cloudiest and wettest and Dunedin was the sunniest.

### September 2014 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland <sup>a</sup>	13.9	+0.9	Above average
Tauranga <sup>b</sup>	13.7	+1.3	Well above average
Hamilton <sup>c</sup>	11.9	+0.6	Above average
Wellington <sup>d</sup>	11.4	+0.6	Above average
Christchurch <sup>e</sup>	8.6	-0.8	Below average
Dunedin <sup>f</sup>	9.2	-0.3	Near average
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland <sup>a</sup>	140	137%	Above normal
Tauranga <sup>b</sup>	.5	-	-
Hamilton <sup>c</sup>	141	140%	Above normal
Wellington <sup>d</sup>	134	136%	Above normal
Christchurch <sup>e</sup>	32	77%	Below normal
Dunedin <sup>f</sup>	39	80%	Near normal
Sunshine			
Location	Sunshine (hours)	% of normal	Comments
Auckland <sup>a</sup>	147	97%	Near normal
Tauranga <sup>b</sup>	164	94%	Near normal
Hamilton <sup>g</sup>	145	101%	Near normal
Wellington <sup>d</sup>	190	116%	Above normal
Christchurch <sup>e</sup>	184	108%	Near normal
Dunedin <sup>f</sup>	193	143%	Well 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

<sup>5</sup> Missing data from 11-19 September

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## Highlights and extreme events

### Temperatures

On 13 September a warm moist northerly quarter flow ahead trough contributed to a warm night and as result several stations recorded near-record high minimum temperatures.

On 24 September several locations in the north of the South Island experienced record or near-record maximum temperatures due to a warm north-easterly flow.

The highest daily temperature was 24.1°C, observed at Leeston on 11 September.

The lowest daily temperature was -6.9°C, observed at Middlemarch on 28 September.

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

Location	Extreme maximum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Motueka	23.9	24th	1956	Highest
Motu	21.8	24th	1990	2nd-highest
Hawera	20.0	13th	1977	2nd-highest
Whakatane	22.8	24th	1975	3rd-highest
Secretary Island	18.2	28th	1985	3rd-highest
Nelson	22.5	24th	1943	3rd-highest
Ngawi	23.0	24th	1972	4th-highest
Takaka	22.3	24th	1978	4th-highest
Haast	20.0	5th	1949	4th-highest
Tiwai Point	21.5	30th	1970	4th-highest
Low records or near-records				
Martinborough	8.1	28th	1986	Lowest
Port Taharoa	11.9	1st	1974	3rd-lowest
Waione	9.8	28th	1993	Equal 3rd-lowest

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

Location	Extreme minimum (°C)	Date of extreme temperature	Year records began	Comments
High records or near-records				
Appleby	13	13th	1941	Equal 2nd-highest
Campbell Island	9.0	11th	1991	Equal 2nd-highest
Motueka	12.4	13th	1972	3rd-highest
Cheviot	12.5	26th	1982	3rd-highest
Waipara West	15.4	12th	1973	3rd-highest
Lumsden	12.9	24th	1982	3rd-highest

Balclutha	11.9	24th	1972	3rd-highest
Stratford	12.3	13th	1972	Equal 3rd-highest
Ohakune	11.4	13th	1972	Equal 3rd-highest
Nelson	13.4	13th	1943	Equal 3rd-highest
Levin	13.8	13th	1950	4th-highest
Nugget Point	11.1	24th	1972	4th-highest
<b>Low records or near-records</b>				
Whangaparaoa	5.1	23rd	1982	2nd-lowest
Rotorua	-2.4	23rd	1964	Equal 3rd-lowest
Lumsden	-4.1	20th	1982	Equal 3rd-lowest

### Rain and slips

On 2 September heavy rain in the Hawke's Bay caused a slip on State Highway 2 between Napier and Wairoa. The slip came down at 1pm and closed the highway overnight.

On 11 September, rain in the South Island brought an end to a long-lasting dry spell. A "dry spell" is defined as a period of 15 days or more with less than 1mm of rain on any one day. The dry spell in Wanaka and Timaru lasted 31 days in total with many other locations also experiencing dry conditions for a comparable length of time.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Hawera	80	13th	1977	Highest
Alexandra	14	12th	1983	4th-highest

### Wind

On 20 September hundreds of households lost power after high winds wrecked electricity lines in the lower North Island. Affected areas included parts of Bulls, Feilding, Himatangi, Marton, Ratana, Turakina and Waitotara.

On 22 September strong south-westerly winds were recorded in many parts of the country and set records at several locations. In Wellington, winds brought down power lines on Grafton Road and closed the Interislander ferry service for the day. The storm also forced buses to replace some train services in the capital after the high tide and wind caused water to cover rail tracks just south of Petone. Christchurch was similarly affected with a roof blown off one house and the loss of power to about 400 homes for a short period after a tree branch fell on power lines. Contractors were kept busy clearing debris and branches off roads especially on State Highway 75 in Banks Peninsula. In Auckland, strong gusts brought down several trees affecting power lines and leaving 10,000 households without power.

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

Location	Extreme wind gust (km/hr)	Date of extreme gust	Year records began	Comments
Hamilton (Ruakura)	83	22nd	1991	Highest
Baring Head	154	22nd	1991	Highest
Whanganui	98	22nd	1977	Highest
Cape Campbell	122	22nd	1963	Highest
Taupo	82	28th	1982	Equal 2nd-highest
Mahia	106	22nd	1991	Equal 2nd-highest
Kaikoura	126	22nd	1972	Equal 2nd-highest
Kaukau Top	145	22nd	1969	Equal 3rd-highest
Warkworth	115	22nd	1972	Equal 4th-highest
Hawera	91	28th	1986	Equal 4th-highest

### Snow and ice

On 22 September a southerly change swept across the country bringing snow and hail and promoted the south-westerly mentioned prior. The snow led to the closure of Desert Road and State Highway 94, Te Anau to Milford Sound, while a combination of ice and strong winds prompted caution from the New Zealand Transport Agency on SH1, Waitati-Dunedin; SH87, Middlemarch-Outram; and SH85, Kyeburn-Palmerston. The cold snap was welcomed by ski fields after a slow start to the season. Porters ski area received 35cm of new snow which was the single largest fall of the season with many other fields also receiving their biggest snow dump of the season on this day.

### Lightning and Hail

On 22 September hail halted bus services in some Dunedin hill suburbs including Brockville and Maori Hill. Hail was also observed in many parts of Auckland throughout the day.

### Cloud and fog

On 2 September a warm moist air mass over the North Island brought about afternoon fog which hung about till 2pm the following day causing flight delays at Hawke's Bay airport.

On 10 September several morning flights in and out of Christchurch Airport were delayed and cancelled due to a thick fog.

On 13 September early morning fog delayed domestic flights out of Auckland. The fog lifted by 9am allowing flights to resume.

On 25 September morning fog struck Christchurch, again delaying and cancelling several flights.

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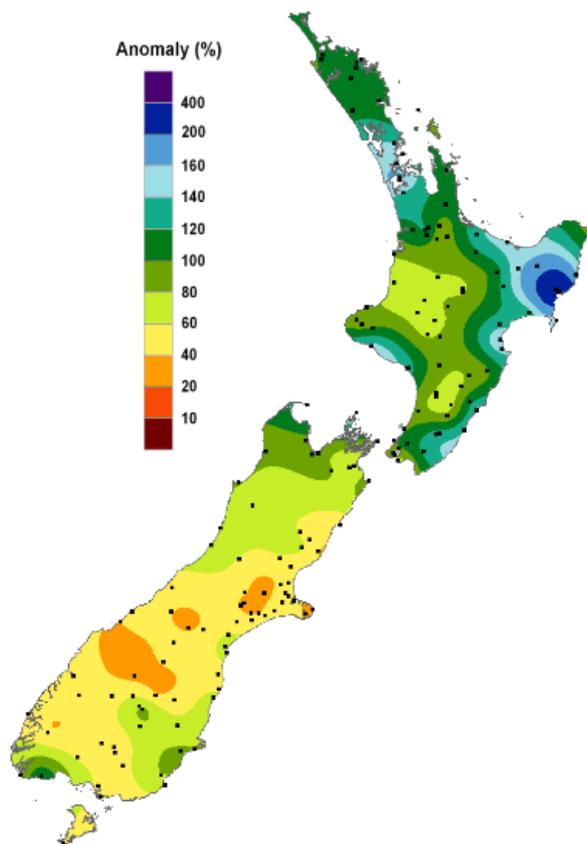
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*September 2014 total rainfall, expressed as a percentage of the 1981-2010 average.*

*Below normal (50-79%) rainfall was recorded for much of the South Island with pockets of well below normal (< 50%) rainfall observed in some locations. Conversely, above normal (120-149%) September rainfall occurred in several North Island regions including parts of Auckland, Bay of Plenty, Gisborne, Hawke's Bay, Manawatu- Whanganui and Taranaki.*

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