

**National Climate Summary – September 2009: Very sunny, with extreme temperature events**

- Sunshine: It was a very sunny start to spring for most of New Zealand.
- Temperature: Close to normal in many regions for the month as a whole. Two extreme temperature events during September: record cold on the 5<sup>th</sup> and 6<sup>th</sup>, record warm on the 14<sup>th</sup>.
- Rainfall: A dry month in inland regions of the South Island, Coromandel and the Wairarapa. In contrast, wetter conditions prevailed over much of the North Island, in Nelson, coastal Southland and coastal Otago. Near normal rainfall elsewhere.

It was a very sunny start to spring. September sunshine totals were well above normal (above 125 percent of normal) in the northern half of the South Island, as well as in the central North Island. In most other regions, sunshine totals were above normal (between 110 and 125 percent of normal).

Temperatures were close to normal for most regions of the country, for the month as a whole. Exceptions were the northeast of the North Island, and around the Southern Lakes, where temperatures were above average (between 0.5°C and 1.2°C above average). The national average temperature was 10.6°C (+0.3°C above the long-term September average). Two extreme temperature events occurred during September, breaking records at many locations; it was extremely cold on the 5<sup>th</sup> and 6<sup>th</sup>, and record warm on the 14<sup>th</sup>.

September was a dry month for inland parts of the South Island. Rainfall was well below normal (less than 50 percent of usual) in parts of inland Otago, inland Canterbury, Westland and Buller. Rainfall totals were below normal (between 50 and 80 percent of normal) for parts of Marlborough, the Kaikoura coast and inland Southland, but near normal elsewhere in the South Island. In contrast, wetter conditions prevailed in the North Island, with near normal rainfall (between 80 and 120 percent of normal) in most districts. Above normal rainfalls (between 120 and 150 percent of normal) were recorded in parts of Northland, eastern Bay of Plenty, Hawkes Bay, Taranaki, as well as around Nelson and Oamaru. Coromandel and the Wairarapa recorded below normal rainfall (between 50 and 80 percent of normal).

Several notable weather events occurred during September. Record cold temperatures were experienced on the 5<sup>th</sup> and 6<sup>th</sup>, when a large anticyclone became slow moving over the country. Extreme northwesterly winds affected the southern South Island on the 14<sup>th</sup>, bringing extreme wind gusts and record-high September temperatures to eastern parts of the South Island. A deep, wintry, low crossed New Zealand on the 24<sup>th</sup>, bringing very cold temperatures to many regions, and high winds, snow and ice to some areas.

During September 2009, higher pressures and more frequent northerly winds affected New Zealand overall.

**Further Highlights:**

- The highest temperature during September 2009 was 29.0°C recorded at Alexandra on the 14th (a September record). The lowest temperature of -7.2°C was recorded at Hanmer Forest on the 4<sup>th</sup>.
- The highest 1-day rainfall total for September was 101.4 mm, recorded at Cape Turnagain on the 24th.
- The highest wind gust for September was 161 km/hr, recorded at Southwest Cape (Stewart Island) on the 1<sup>st</sup>.
- Of the six main centres, Tauranga was the warmest and sunniest, Hamilton the wettest, and Christchurch the coolest and driest.

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## SUNSHINE: A VERY SUNNY MONTH ACROSS MOST OF NEW ZEALAND.

It was a very sunny start to spring. September sunshine totals were well above normal (above 125 percent of normal) in the northern half of the South Island (Canterbury, Westland, Buller, Nelson and Marlborough), as well as in the central North Island. It was also rather sunny in most other regions, with sunshine totals between 110 and 125 percent of normal. The exceptions were Southland, around Dunedin, and near Cape Reinga, where near normal sunshine totals were observed (between 90 and 110 percent of normal).

Te Kuiti recorded 178 hours of sunshine in September (150% of normal), the highest September sunshine total there, in records that extend back to 1962. Greymouth and Taumarunui also experienced extremely high September sunshine totals, with around 155% of usual sunshine experienced.

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

Location	Sunshine (hours)	Percentage Of normal	Year records began	Comments
Te Kuiti	178	150	1962	Highest
Taumarunui	171	156	1947	2nd-highest
Turangi	173	127	1976	2nd-highest
Hokitika	186	130	1964	4th-highest
Greymouth	205	155	1947	3rd-highest

## TEMPERATURES: CLOSE TO AVERAGE IN MANY LOCATIONS

September temperatures were close to normal for most regions of the country. Exceptions were the northeast of the North Island and around the Southern Lakes, where temperatures were above average (between 0.5°C and 1.2°C above average). The national average temperature was 10.6°C (+0.3°C above the long-term September average).

### Extreme high September mean maximum daily air temperatures were recorded at:

Location	Mean maximum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Whangaparaoa	16.8	1.5	1982	2nd-highest
Kumeu (Waitakere)	17.2	0.9	1978	2nd-highest
Whenuapai	17.5	1.2	1945	2nd-highest
Lake Rotoiti	14.2	2.4	1965	2nd-highest

Record low September minimum temperatures were observed at Dunedin (Airport), with a monthly mean minimum temperature of 2.7°C, the lowest at that site since records began in 1947.

### Extreme low September mean minimum daily air temperatures were recorded at:

Location	Mean minimum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Kumeu (Waitakere)	7.1	-1.1	1978	3rd-lowest
Dannevirke	4.0	-2.1	1951	2nd-lowest
Martinborough	4.7	-1.2	1986	3rd-lowest
Wanganui	7.0	-1	1987	4th-lowest
Blenheim	3.4	-1.4	1932	4th-lowest
Hanmer Forest	-0.3	-2.1	1906	2nd-lowest
Dunedin (Airport)	2.7	-0.3	1947	Lowest

## RAINFALL: A DRY MONTH IN THE SOUTH ISLAND, WETTER IN THE NORTH ISLAND.

Rainfall was well below normal (less than 50 percent of normal) in parts of inland Otago, inland Canterbury, and parts of Westland and Buller. Rainfall totals were below normal (between 50 and 80 percent of normal) for Malborough, the Kaikoura coast and inland Southland. In contrast, wetter conditions prevailed for the North Island, with near normal rainfall (between 80 and 120 percent of normal) in most districts. Above normal rainfalls (between 120 and 150 percent of normal) were recorded in parts of Northland, eastern Bay of Plenty, Hawkes Bay, Taranaki, as well as around Nelson and Oamaru. Coromandel and the Wairarapa were the driest regions of the North Island, recording below normal rainfall (between 50 and 80 percent of normal).

### Near-record low September rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
Lake Tekapo	9	18	1925	4 <sup>th</sup> -lowest
Lumsden	26	40	1982	2 <sup>nd</sup> -lowest

## SEPTEMBER CLIMATE IN THE SIX MAIN CENTRES

September temperatures were above average in Tauranga and Dunedin, but near average in all other centres. Monthly rainfalls were below normal for Auckland and Christchurch, above normal in Hamilton, and near normal in the other main centres. Sunshine totals for September were above normal in all six main centres (between 110 and 125 percent of normal).

Of the six main centres, Tauranga was the warmest and sunniest, Hamilton the wettest, and Christchurch the coolest and driest.

### September 2009 main centre climate statistics:

Location	Mean temp. (°C)	Departure from normal (°C)		Rainfall (mm)	% of normal		Sunshine (hours)	% of normal	
Auckland <sup>a</sup>	12.9	0.0	Near average	80	75%	Below normal	186	125%	Well above normal
Tauranga <sup>b</sup>	13.0	+1.0	Above average	93	90%	Near normal	201	122%	Above normal
Hamilton	11.4	+0.3	Near average	134	124%	Above normal	173	119%	Above normal
Wellington <sup>c</sup>	10.9	+0.3	Near average	90	89%	Near normal	184	118%	Above normal
Christchurch <sup>d</sup>	9.2	-0.1	Near average	33	73%	Below normal	198	120%	Above normal
Dunedin	9.9	+0.6	Above average	46	87%	Near normal	147	114%	Above normal

<sup>a</sup> Mangere    <sup>b</sup> Tauranga Airport    <sup>c</sup> Kelburn    <sup>d</sup> Christchurch Airport    <sup>e</sup> Ruakura

## HIGHLIGHTS AND EXTREME EVENTS

### • Temperature

The highest temperature during September 2009 was 29.0°C recorded at Alexandra on the 14th (a September record for this site), associated with the severe north-westerly winds experienced over the southern South Island on that day. Record high September maximum temperatures were also observed on the 14<sup>th</sup>/15<sup>th</sup> at Farewell Spit, Orari (South Canterbury), Timaru, and Cromwell. Numerous other locations also experienced near-record maximum temperatures on the 14<sup>th</sup>.

Near-record cold afternoon conditions were experienced on September 4/5<sup>th</sup> and 24<sup>th</sup>, with very low maximum temperatures recorded at multiple Northland, Auckland, Nelson and Buller stations.

**Extreme daily maximum air temperatures were recorded at:**

Location	Extreme maximum temperature (°C)	Date of extreme temperature	Year Records began	Comments
Kaitaia	21.5	13 <sup>th</sup>	1985	3rd-highest
Kaikohe	20.7	14 <sup>th</sup>	1973	4th-highest
Kumeu (Waitakere)	20.4	14 <sup>th</sup>	1978	3rd-highest
Ngawi	23.4	14th	1972	3rd-highest
Farewell Spit	20.9	15th	1971	Highest
Lake Rotoiti	21.6	14th	1965	Equal 2nd-highest
Appleby (Nelson)	21.8	15th	1943	3rd-highest
Blenheim	24.4	14th	1932	2nd-highest
Hanmer Forest	26.1	14th	1906	4th-highest
Culverden	24.0	11th	1928	Equal 4th-highest
Le Bons Bay (Banks Peninsula)	22.4	14th	1984	2nd-highest
Orari (South Canterbury)	27.5	14th	1972	Highest
Timaru	28.2	14th	1885	Highest
Oamaru	26.4	14th	1908	2nd-highest
Dunedin (Musselburgh)	25.4	14th	1947	2nd-highest
Manapouri	19.7	14th	1963	2nd-highest
Alexandra	29.0	14th	1928	Highest
Queenstown	23.3	14th	1871	4th-highest
Lumsden	21.0	14th	1982	Equal 3rd-highest
Cromwell	26.0	14th	1949	Highest
Kaitaia	12.9	5th	1972	4th-lowest
Dargaville	11.5	5th	1951	2nd-lowest
Whangarei	11.7	4th	1967	3rd-lowest
Warkworth	11.8	4th	1966	3rd-lowest
Whangaparaoa	11.9	4th	1982	2nd-lowest
Hicks Bay	10.6	4th	1972	3rd-lowest
Takaka	9.8	24th	1978	2nd-lowest
Farewell Spit	10.0	24th	1972	2nd-lowest
Reefton	7.4	24th	1972	2nd-lowest
Motueka	8.6	24th	1972	2nd-lowest
Arthurs Pass	1.5	24th	1973	4th-lowest

The lowest September temperature was recorded at Hanmer Forest on the 4<sup>th</sup>, with a minimum temperature of -7.2°C (not a September record for this location). Numerous September minimum temperature records were broken on the 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> of the month, across the country.

**Extreme daily minimum air temperatures were recorded at:**

Location	Extreme minimum temperature (°C)	Date of extreme temperature	Year Records began	Comments
Kaitaia	2.2	7th	1967	4th-lowest
Warkworth	1.2	6th	1966	Lowest
Whangaparaoa	5.4	5th	1982	Lowest
Kumeu (Waitakere)	-1.5	6th	1978	Lowest
Whitianga	-1.3	6th	1962	Lowest
Ruakura	-2.8	6th	1906	Equal 3rd-lowest
Hamilton	-2.2	6th	1946	Equal lowest
Port Taharoa	1.5	6th	1973	Lowest
Te Kuiti	-2.3	5th	1959	Lowest
Taumarunui	-4.2	5th	1947	2nd-lowest

Turangi	-5.0	5th	1968	2nd-lowest
Dannevirke	-3.4	5th	1951	3rd-lowest
Martinborough	-2.9	5th	1986	3rd-lowest
Ngawi	2.7	5th	1972	Lowest
Paraparaumu	-2.8	5th	1953	2nd-lowest
Levin	-2.3	5th	1895	3rd-lowest
Wallaceville	-4.0	6th	1939	Equal 3rd-lowest
Stratford	-1.6	7th	1960	4th-lowest
Hawera	-2.7	5th	1977	Lowest
Wanganui	0.1	5th	1987	Equal lowest
Takaka	-0.9	6th	1978	4th-lowest
Motueka	-2.2	5th	1956	3rd-lowest
Blenheim	-3.5	5th	1932	Lowest
Culverden	-6.0	5th	1928	4th-lowest
Christchurch (Airport)	-3.9	4th	1863	2nd-lowest
Oamaru	-4.0	5th	1908	3rd-lowest
Dunedin (Airport)	-4.7	5th	1947	Lowest
Queenstown	-3.8	4th	1871	Equal 3rd-lowest
Lumsden	-4.8	4th	1982	2nd-lowest
Gore	-3.4	4th	1971	Equal 4th-lowest

- **Heavy rain and flooding**

The highest 1-day rainfall total for September was 101.4 mm, recorded at Cape Turnagain on the 24th. High 1-day rainfall totals for September are shown below. Notably, Dannevirke experienced its highest September 1-day rainfall event on the 24<sup>th</sup> of the month, with 64 mm observed.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year Records Began	Comments
Whakatane	76	24th	1952	3rd-highest
Dannevirke	64	24th	1951	Highest
Appleby (Nelson)	59	29th	1941	3rd-highest

A major slip in the Johnsonville suburb of Wellington in the early hours of 1 September left houses at the top of a bank, in a precarious position, and blocked a private driveway.

A downpour in Stratford on 17 September, with 27.4 mm of rain falling in 20 minutes, caused surface flooding on roads and the high school grounds.

SH1, north of Bulls, was affected by flooding on 24 September.

Heavy rain on 28 September caused slips and blocked Old Russell Road on Helena Bay Hill in the Whangarei area.

- **High winds and tornadoes**

The highest wind gust for September was 161 km/hr, recorded at Southwest Cape (Stewart Island) on the 1<sup>st</sup> (not a September record at this site).

A 10 m twister caused havoc on an Invercargill farm on 2 September, when it picked up water from a ditch throwing it as high as the power lines, and taking the corrugated roof off a shed.

A significant wind event occurred on the 14<sup>th</sup>, with widespread and record-high wind gusts experienced over the southern half of the South Island during a storm-force northwesterly event. Damage included

felled power lines and lifted roofs on the Otago peninsula. Near Arrowtown, a tree felled by the wind, crashed on to a vehicle, killing the driver.

A tornado funnel cloud, reported over eastern Taranaki on 17 September, dissipated before it touched the ground.

On 28 September, a tornado in Ramarama, south of Auckland, damaged properties, some severely, and uprooted trees.

**Record or near record high extreme wind gusts for September were recorded at:**

Location	Extreme wind gust speed (km/hr)	Date of extreme gust	Year Records Began	Comments
Westport	91	24th	1973	Equal 3rd-highest
Tara Hills	107	14th	1985	Highest
Lauder	119	14th	1981	Equal 4th-highest

- **Snow and ice**

On 2 September, snow closed the Crown Range Road, and both Cardrona and The Remarkables ski fields after 25-35 cm of fresh snow fell overnight. The Milford Road, and Old Coach Road from Matura to Clinton, were also closed in the morning.

SH2 over the Rimutaka Hill was closed by snow for several hours on 24 September. Heavy snow also fell in the Tararua district, closing both the Pahiatua Track and Saddle Road. The weight of the snow tore boughs from trees, interrupted power supplies, and some houses in Atea Valley were on low voltage power all night, meaning appliances like television sets, computers, fridges and freezers had to be turned off. In the Nelson region, SH60 was closed at Takaka Hill.

- **Lightning**

Two electrical storms struck Southland early on 2 September, damaging trees outside and electrical equipment inside. A third storm struck Invercargill about 6 pm, with lightning strike hitting a transformer, knocking out power to several houses.

On 28 September, an Air New Zealand flight from New Plymouth to Christchurch was diverted to Nelson, following a suspected lightning strike. Lightning was reported from many North Island locations.

- **Hail**

On 4 September, hail occurred in Wellington, and at the Matawhero sheep sale, Gisborne.

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