

National Climate Summary – September 2006: Extremely dry in the east; third warmest on record

Rainfall: Extremely low in the east from Wairarapa to Otago; above average in Fiordland and coastal Southland

Significant soil moisture deficits in Central Otago, deficits developing in other eastern regions

Temperature: Above average, especially in the east from Marlborough to Central Otago

Sunshine: Very sunny in Gisborne, Otago, and inland South Canterbury

Very windy in the south of the South Island

September was a month of climate extremes with record low rainfall and high mean temperatures at many locations. Rainfall was low throughout much of New Zealand, especially in the east from Wairarapa to Canterbury, some Canterbury locations recording 10 percent (one tenth) or less of normal rainfall. There was about 10 mm or less in some parts of Marlborough, Canterbury and Otago. The low rainfall has resulted in the development of significant soil moisture deficits (110 mm or more) in Central Otago. Soil moisture deficits, although not major, also exist as far north as Marlborough. It was the third warmest September on record, with the national average temperature being 11.6 °C, 1.2 °C above normal. Temperatures were above average throughout New Zealand, especially in the east from Marlborough to Otago where they were about 2.0 °C above average producing new records of mean temperature. Maximum temperatures exceeded 20 °C in many eastern regions from 21 through 26 September. Sunshine hours were above normal over much of New Zealand, especially in eastern regions. In contrast, it was unsettled and much windier than normal in Fiordland and along the Southland coast, the only districts where September rainfall was above normal. More anticyclones ('highs') predominated over the Tasman and across the North Island, with below average pressures well south of New Zealand. This pattern produced much stronger westerlies than normal over the South Island, and more frequent strong winds than average in Wellington, South Canterbury, Otago, and Southland.

Other Highlights:

The highest temperature during September 2006 was 25.0 °C recorded in Napier on the 22nd. Near or record high September air temperatures were recorded in Dunedin Airport (24.9 °C), Invercargill (23.1 °C) and Queenstown (24.3 °C) on the 25th, and at Gisborne (24.9 °C) on the 26th.

The lowest air temperature for the month was -5.6 °C recorded at Hanmer Forest on the 11th.

A wind gust of 180 km/h from the northwest was recorded at Southwest Cape (Stewart Island) on the 2nd, a new record for a wind gust at that site (measurements commenced in 1992).

High rainfall affected the southwest of the South Island over the 1st, 4th-5th, 15th, 18th-21st, 23rd, and 25th of September. Heavy rainfall totalling 294 mm was measured at Milford Sound from the 18th-21st.

High rainfall also affected the North of the North Island on the 9th and 10th.

Christchurch was the driest, Dunedin the sunniest, and Auckland the wettest of the main centres. Rainfall was below normal, and temperatures above normal in all five main centres. It was extremely warm and dry for the time of year in Christchurch. Sunshine hours were near normal in Wellington, and above normal in the four other main centres, with record values in Dunedin.

Rainfall: September rainfall was extremely low, being 10 percent (one tenth) or less of normal in parts of Canterbury, and 25 percent (quarter) or less of normal in Waikato, Southern Wairarapa, Marlborough, and North and East Otago. In many of these locations it was the lowest September rainfall on record. Rainfall was also well below normal in many other parts of the North Island, as well as Nelson. In contrast, Fiordland and the Southland coast were the only districts where rainfall was above normal, by as much as 50 percent.

Temperature: Mean temperatures were about 2.0 °C above average in parts of Marlborough, Canterbury, and Otago, and more than 1.0 °C above average in parts of Wairarapa, Hawke's Bay, Kapiti, Wellington, Nelson, and Southland. Temperatures were also above average in most other regions.

Sunshine: Sunshine hours and/or solar radiation were at least 120 percent of normal in Gisborne, inland South Canterbury, and Otago. It was also sunny in Northland, Auckland, Waikato, Bay of Plenty, Napier, Marlborough, Nelson, and North Canterbury.

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**LOW RAINFALL, ESPECIALLY IN THE EAST FROM WAIRARAPA TO CANTERBURY
ABOVE AVERAGE RAINFALL IN FIORDLAND AND THE SOUTHLAND COAST**

September rainfall totals were extremely low, being 10 percent (one tenth) or less of normal in parts of Canterbury, and 25 percent (quarter) or less of normal in Waikato, Southern Wairarapa, Marlborough, and North and East Otago. Rainfall was also low with totals 50 percent (half) or less of normal in parts of Northland, Auckland, Thames, much of the west of the North Island from Taranaki to Wellington, as well as Nelson, and 75 percent (three quarters) or less of normal in most other North Island regions, as well as Buller. New low monthly rainfall records occurred in parts of Northland, Waikato, Bay of Plenty, Wairarapa, Marlborough, and Canterbury, and about 10 mm or less was recorded in some parts of coastal Marlborough, Canterbury and Otago. In contrast, Fiordland and the Southland coast were the only districts where rainfall was above (up to 150% of) normal.

Low September rainfall was recorded at:

Location	September Rainfall (mm)	Percentage of normal	Year Records began	Comments
Kerikeri EWS	43	24	1982	Lowest
Kerikeri Airport	47	29	1978	Lowest
Kaikohe	61	45	1973	3 rd Lowest
Matamata, Hinuera	34	27	1999	Lowest
Te Puke	53	39	1973	Lowest
Rotorua Airport	41	35	1964	2 nd lowest
Taupo Airport	24	29	1976	2 nd lowest
Pukekohe	42	36	1970	Lowest
Hamilton, Ruakura	21	20	1906	Lowest
Hamilton Airport	28	26	1935	Lowest
East Taratahi	17	25	1972	2 nd lowest
Wellington Airport	25	31	1960	3 rd lowest
Waiuoru MWD	32	36	1950	2 nd lowest
Motueka, Riwaka	23	20	1943	Equal 2 nd lowest
Nelson Airport	21	30	1941	Equal 3 rd lowest
Nelson, Appleby	11	15	1932	2 nd lowest
Blenheim Research	7	14	1929	3 rd lowest
Blenheim Airport	10	15	1941	Equal 2 nd lowest
Winchmore	11	21	1947	Equal 3 rd lowest
Rangiora	11	19	1999	2 nd lowest
Darfield	9	15	1920	Equal lowest
Christchurch Airport	4	8	1944	2 nd lowest
Lincoln, Broadfield	3	7	1881	Equal 2 nd lowest
Le Bons Bay	10	16	1987	Lowest
Ranfurlly	5	19	2000	Lowest
Ettrick	10	22	1985	3 rd lowest
Chatham Islands	17	24	1951	Lowest

**TEMPERATURE: ABOVE AVERAGE, ESPECIALLY IN THE EAST FROM MARLBOROUGH
TO CENTRAL OTAGO**

It was the third equal warmest September on record, with the national average temperature being 11.6°C, 1.2 °C above normal. The only warmer September months were in 1988 (11.9) and 1996 (11.6). Mean temperatures were about 2.0 °C above average in parts of Marlborough, Canterbury, and Otago, producing new record September mean temperatures at several sites in these regions. Mean temperatures were more than 1.0 °C above average in parts of Wairarapa, Hawke’s Bay, Kapiti, Wellington, Nelson, and Southland. They were more than 0.5 °C above average in most other regions.

High September mean temperatures were recorded at:

Location	September Mean air temperature (°C)	Departure from normal (°C)	Year Records began	Comments
Mt Ruapehu, Chateau	6.3	+1.6	1981	2 nd equal highest
Ngawi, Palliser	13.9	+2.0	1972	Equal highest
Mahia AWS	13.1	+1.8	1991	Highest
Napier Airport	12.7	+1.3	1974	Equal 3 rd highest
Paraparaumu Airport	12.3	+1.4	1953	Equal highest
Wellington Airport	12.7	+1.4	1962	3 rd equal highest
Wallaceville	11.8	+1.6	1940	3 rd highest
Farewell Spit	12.8	+1.3	1971	Equal highest
Reefton	10.7	+1.4	1960	Equal 3 rd highest
Nelson Airport	11.9	+1.7	1943	Highest
Blenheim Research	12.5	+1.8	1932	3 rd highest
Blenheim Airport	11.7	+1.4	1941	2 nd highest
Kaikoura	11.9	+1.8	1964	Well above normal
Mt Cook Village	8.7	+2.1	1930	2 nd highest
Winchmore	10.9	+2.0	1950	2 nd highest
Rangiora	10.8	+1.5	1999	Highest
Darfield	11.7	+2.2	1939	Equal 2 nd highest
Lincoln, Broadfield	11.2	+1.9	1881	Well above normal
Le Bons Bay	10.9	+2.0	1984	Highest
Lake Tekapo	8.6	+2.1	1927	Well above normal
Timaru Airport	9.9	+1.4	1962	Equal 3 rd highest
Tara Hills	9.3	+2.1	1950	Equal highest
Wanaka Airport	9.9	+1.6	1992	Highest
Dunedin Airport	10.5	+1.9	1963	Highest
Dunedin, Musselburgh	11.3	+2.0	1947	Highest
Queenstown	10.3	+1.7	1871	Equal 2 nd highest
Lumsden	9.6	+1.7	1982	2 nd highest
Clyde EWS	10.4	+1.8	1983	Equal highest
Invercargill Airport	9.7	+1.4	1948	3 rd highest

VERY SUNNY IN GISBORNE, OTAGO, AND INLAND SOUTH CANTERBURY

Sunshine hours and/or solar radiation were at least 120 percent of normal in Gisborne, inland South Canterbury, and Otago, and at least 110 percent of normal in Northland, Auckland, Waikato, Bay of Plenty, Napier, Marlborough, Nelson, and North Canterbury. Sunshine hours were near normal in most other regions.

Well above average September sunshine hours were recorded at:

Location	September Sunshine (hours)	Percentage of normal	Year records began	Comments
Gisborne Airport	224	130	1905	Well above normal

Lake Tekapo	246	140	1928	3 rd highest
Dunedin, Musselburgh	194	150	1932	Equal highest

SEPTEMBER'S CLIMATE IN THE FIVE MAIN CENTRES

Christchurch was the driest, Dunedin the sunniest, and Auckland the wettest of the main centres. Rainfall was below normal, and temperatures above normal in all five main centres. It was extremely warm and dry for the time of year in Christchurch. Sunshine hours were near normal in Wellington, and above normal in the four other main centres, with record high hours in Dunedin.

Location	Sept. Mean Temp. (°C)	Dep. from normal (°C)		Sept. rainfall (mm)	% of Normal		Sept. Sunshine (hours)	% of Normal	
Auckland	13.7	+0.8	Above normal	58 ^a	50	Well below normal	181	121	Above normal
Hamilton	12.1	+0.7	Above normal	21	20	Well below normal	176	118	Above normal
Wellington	11.2	+0.6	Above normal	39	38	Well below normal	157	100	Near normal
Christchurch	10.6	+1.3	Above normal	4 ^b	8	2 nd lowest	185 ^b	112	Above normal
Dunedin	11.3	+2.0	Highest on record	12	22	Well below normal	194	150	Equal highest

^a Owairaka ^b Christchurch Airport

HIGHLIGHTS AND EXTREME EVENTS

Temperature

Maximum temperatures exceeded 20.0 °C in many eastern regions from 21 through 26 September. The highest temperature during September 2006 was 25.0 °C recorded in Napier on the 22nd. The lowest air temperature for the month was -5.6 °C recorded at Hanmer Forest on the 11th.

Extremely high September maximum temperatures were recorded at:

Location	Maximum temperature (°C)	Date	Year Records began	Comments
Napier, Nelson Park	25.0	22 Sep.	1868	-
Gisborne Airport	24.9	26 Sep.	1905	3 rd highest
Dunedin Airport	24.9	25 Sep.	1963	Highest
Queenstown	24.3	25 Sep.	1871	Highest
Whakatane Airport	23.8	24 Sep.	1975	2 nd highest
Invercargill Airport	23.1	25 Sep.	1905	2 nd highest

High winds

A wind gust of 180 km/h from the northwest was recorded at Southwest Cape (Stewart Island) on the 2nd, a new record for a wind gust at that site (measurements which commenced in 1992). Mean wind speeds reached 128 km/h.

High rainfall

There were several high rainfall events, with at least 50 mm in 24 hours, during September. These were:

Date	Region/s affected	Locations with high rainfall	Rainfall (mm)
1 Sep.	Southern Lakes	Manapouri, West Arm	88 (1-day)
4 Sep.	Fiordland, Southern Alps	Milford Sound	73 (1-day)
5 Sep.	Westland	Hokitika Airport	62 (1-day)
9 Sep.	Auckland, Coromandel, East Cape	Whitianga Airport	63 (1-day)
10 Sep.	Northland	Whangarei Airport	53 (1-day)
15 Sep.	Fiordland	Milford Sound	67 (1-day)
18-21 Sep.	Fiordland, Southern Alps	Milford Sound	294 (4-days)
23 Sep.	Fiordland, Southern Alps	Milford Sound	50 (1-day)
25 Sep.	Fiordland	Milford Sound	115 (1-day)

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