

**National Climate Summary – Spring 2006**

**Spring 2006: Distinctive El Niño spring with blustery westerlies and south westerlies; very windy at times with stronger than usual east/west contrasts in climate**

**Rainfall: Dry in Northland, coastal Bay of Plenty, Gisborne, Hawke's Bay, and eastern Otago; wet in the southwest of the North Island, and the west and far south of the South Island**

**Sunshine: Sunny in the northeast of the North Island and southeast of the South Island, rather cloudy in the west of the North Island**

**Temperature: Warm in the east of the North Island and Marlborough; temperatures near normal elsewhere**

Classic El Niño weather patterns produced a spring with many days of westerly gales over the country, with marked contrasts in climate between western and eastern areas. Significant windstorms occurred in some part of New Zealand on at least ten separate occasions, with blustery conditions on many others. Western areas of the North Island and the west and far south of the South Island had very stormy conditions at times whilst the Bay of Plenty, Gisborne and Hawke's Bay were relatively dry, sunny and mild.

Windstorms particularly in October and November produced one of the windiest springs in the South Island and southern North Island in the past two decades, with the loss of one life and damage to property including blowing down forest trees. Spring rainfall was only 50 to 75 percent (half to three quarters) of normal in Northland, coastal Bay of Plenty, Gisborne, Hawke's Bay, and east Otago, with significant soil moisture deficits developed in Gisborne, Hawke's Bay, coastal Marlborough and coastal Bay of Plenty by the conclusion of spring. In contrast spring rainfall was 125 to 150 percent or normal from Manawatu to Wellington, parts of the Southern Lakes and Fiordland. Sunshine showed similar east/west patterns with extremely high values in parts of the southeast of the South Island, and low totals in the west of the North Island from Taranaki to Wellington. The national average temperature for spring of 12.3°C was slightly warmer than normal, being 0.3°C above average. Spring temperatures were particularly mild in Gisborne, Hawke's Bay and Marlborough and parts of central Canterbury where these were up to 1°C above average. These patterns were produced by lower pressures than normal to the south and south east of New Zealand, and higher pressures over the north, resulting in much more frequent westerly winds than normal. These produced the drying hot foehn westerly winds in the east, with frequent rain days in the west, and pushed Lake Wakatipu towards flood levels by the end of November.

**Major Highlights:**

The highest temperature during spring was 30.4 °C recorded at Gisborne Airport on the 13<sup>th</sup> October. 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 25<sup>th</sup>, and at Gisborne (24.9 °C) on the 26<sup>th</sup> September.

The lowest air temperature for spring was -5.6 °C recorded at Hanmer Forest on the 11<sup>th</sup> September.

High rainfall events were very frequent throughout spring in Fiordland, parts of the Southern Lakes, and Arthur's Pass on about 20 occasions, and high rainfall events occurred in Auckland, Taranaki, Wellington and Golden Bay. Surface flooding occurred in the Wairarapa, and in Wellington during Labour weekend.

Severe weather on 1 October produced high winds, attributed to tornadoes or waterspouts, which damaged trees and property in West Auckland. Heavy rainfall and widespread surface flooding occurred on the same day in parts of Auckland City.

A wind gust of 180 km/h from the northwest was recorded at Southwest Cape (Stewart Island) on the 2<sup>nd</sup> September, a new record for a wind gust at that site (measurements commenced in 1992). Windstorms were very frequent, with southerly gales occurring through Cook Strait and Wellington on 4<sup>th</sup>, 5<sup>th</sup> and 24<sup>th</sup> of October, disrupting sea and air transport. The many more days of strong or gale force westerly quarter winds produced fallen trees and power lines on 9/10 November in Auckland and Bay of Plenty, and felled

trees in North Canterbury on 14 November killing one person.

Of the five main centres, spring was especially pleasant in Dunedin. Dunedin again was easily the driest, and Wellington the wettest. Christchurch was the sunniest. Rainfall was above average in Auckland, Wellington and Christchurch, below average in Hamilton and well below average in Dunedin. Temperatures were above average in Dunedin and below average in Wellington. Spring sunshine totals were above average in Christchurch, and well above average in Dunedin. These were below average in Hamilton and Wellington.

**Rainfall:** Spring rainfall was less than 75 percent (three quarters) of normal in eastern Northland, Coromandel, Bay of Plenty, Gisborne, northern Hawke’s Bay, and East Otago. Rainfall was near normal elsewhere. Rainfall was at least 125 percent (one and a quarter) of normal in Manawatu, Horowhenua, Kapiti, South Westland, Queenstown area and coastal Southland.

**Sunshine:** Sunshine totals in spring were at least 110 percent of normal in Gisborne, and from Canterbury to Southland. However, 90 percent or less of normal occurred in the west of the North Island, especially in Manawatu. Gisborne and Dunedin recorded their third sunniest spring on record.

**Temperature:** Seasonal mean temperatures were slightly above normal for New Zealand overall. These were nearly 1°C above normal in the east of the North Island. They were 0 to 0.5°C in most other areas, and close to average in the west and south of the South Island.

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**BELOW NORMAL RAINFALL IN THE NORTHEAST OF THE NORTH ISLAND; WET IN THE SOUTHWEST OF THE NORTH ISLAND AND SOUTHWESTERN PARTS OF THE SOUTH ISLAND;**

Spring rainfall was less than 75 percent (three quarters) of normal in eastern Northland, Coromandel, Bay of Plenty, Gisborne, northern Hawke’s Bay, and East Otago. Rainfall was at least 125 percent (one and a quarter) of normal in Manawatu, Horowhenua, Kapiti, South Westland, Queenstown area and coastal Southland. Rainfall was near normal elsewhere.

**Unusually low spring rainfall was recorded at:**

Location	Spring 2006 rainfall (mm)	Percentage of normal	Year Records began	Comments
Kerikeri	194	43	1981	Lowest
Kaikohe	210	59	1973	3 <sup>rd</sup> lowest
Mokohinau	113	49	1934	3 <sup>rd</sup> lowest
Te Puke	194	47	1973	Lowest
Rotorua Airport	192	56	1964	2 <sup>nd</sup> lowest
Middlemarch	74	56	1916	Lowest since 1981
Musselburgh	102	55	1918	4 <sup>th</sup> lowest
Raoul Island	128	44	1937	2 <sup>nd</sup> lowest

**High spring rainfall was recorded at:**

Location	Spring 2006 rainfall (mm)	Percentage of normal	Year Records began	Comments
Palmerston North Airport	325	146	1943	2 <sup>nd</sup> highest
Puysegur Point	751	164	1879	Well above normal
Mt Cook Village	1682	146	1928	Highest since Nov. 1994
Queenstown	364	153	1871	Well above normal

**WINDY THROUGHOUT THE SOUTH ISLAND AND SOUTHERN NORTH ISLAND**

Although spring is normally the windiest season in New Zealand, this year it was particularly windy. Strong gusty winds were more frequent than average over much of the South Island and over the southern North Island, especially in the east. Some locations had two weeks worth of gusty days more than is typically experienced at this time of year. Wind records and pressure indices indicate that it was one of the windiest springs in the past 20 years of record over much of New Zealand.

**Locations with a near or record high number of windy days (gusts to at least 60 km/h) during Spring:**

Location	Days with wind gusts of at least 60 km/h	Departure from normal	Year records began	Comments
Castlepoint	80	+14	1972	Equal highest
Wellington, Kelburn	77	+17	1967	Highest
Tara Hills	24	+12	1985	2 <sup>nd</sup> highest
Dunedin Airport	36	+13	1992	Highest
Puysegur Point	68	+9	1991	Highest
South West Cape	79	+12	1991	Highest

**SUNNY IN THE NORTHEAST OF THE NORTH ISLAND AND SOUTHEAST OF THE SOUTH ISLAND, RATHER CLOUDY IN THE WEST OF THE NORTH ISLAND**

Sunshine totals in spring were at least 110 percent of normal in Gisborne, and from Canterbury to Southland. with over 120 percent of normal in Gisborne and Dunedin. Gisborne and Dunedin had their 3<sup>rd</sup> sunniest spring on record. However, sunshine hours were 90 percent or less of normal in the west of the North Island, with less than 75 percent of normal in Palmerston North. In other regions sunshine totals were close to or slightly above normal.

**Near record high or low spring sunshine totals were recorded at:**

Location	Spring 2006 sunshine (hours)	Percentage of normal	Year Records began	Comments
Gisborne	718	120	1905	3 <sup>rd</sup> sunniest
Palmerston North	318	72	1930	2 <sup>nd</sup> lowest
Dunedin, Musselburgh	549	126	1948	3 <sup>rd</sup> highest

## TEMPERATURE: ABOVE NORMAL IN THE EAST OF THE NORTH ISLAND AND MARLBOROUGH; NEAR NORMAL ELSEWHERE

Seasonal mean temperatures were slightly above normal for New Zealand overall. The national average temperature for spring of 12.3°C was 0.3°C above average. These were close to 1°C above normal in the east of the North Island. They were between 0 to 0.5°C in most other areas, and near normal in the west and south of the South Island. September 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. November mean maximum temperatures in Hawke’s Bay were equivalent to January values.

### SPRING CLIMATE IN THE FIVE MAIN CENTRES

Of the five main centres, Dunedin again was easily the driest, and Wellington the wettest. Christchurch was the sunniest. Rainfall was above average in Auckland, Wellington and Christchurch, below average in Hamilton and well below average in Dunedin. Temperatures were above average in Dunedin and below average in Wellington. Spring sunshine totals were above average in Christchurch, and well above average in Dunedin. These were below average in Hamilton and Wellington.

Location	Winter Mean Temp. (°C)	Dep. from normal (°C)		Winter rainfall (mm)	% of normal		Winter Sunshine (hours)	% of normal	
Auckland	14.7	+0.2	Average	347 <sup>a</sup>	116	Above average	541	104	Average
Hamilton	12.9	+0.1	Average	213 <sup>b</sup>	73	Below average	458	88	Below average
Wellington	11.5	-0.5	Below average	398	127	Well above average	504	90	Below average
Christchurch <sup>c</sup>	11.6	+0.1	Average	146	110	Above average	641	111	Above average
Dunedin	11.5	+0.7	Above average	102	55	Well below average	549	126	Well above average

a Owairaka, b Hamilton Airport, c Christchurch Airport

### HIGHLIGHTS AND EXTREME EVENTS

#### Temperature

**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 <sup>rd</sup> highest
Dunedin Airport	24.9	25 Sep.	1963	Highest
Queenstown	24.3	25 Sep.	1871	Highest
Whakatane Airport	23.8	24 Sep.	1975	2 <sup>nd</sup> highest
Invercargill Airport	23.1	25 Sep.	1905	2 <sup>nd</sup> highest

The highest temperature during spring was 30.4 °C recorded at Gisborne Airport on the 13<sup>th</sup> October. 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 25<sup>th</sup>, and at Gisborne (24.9 °C) on the 26<sup>th</sup> September.



The lowest air temperature for spring was -5.6 °C recorded at Hanmer Forest on the 11<sup>th</sup> September.

### **High rainfall**

High rainfall events were very frequent during spring in the west and south of the South Island, but none caused any severe flooding. However, at the end of November, Lake Wakatipu levels peaked with Queenstown on flood alert from 24<sup>th</sup> November.

High rainfall affected Wellington, Taranaki, and Golden Bay on the 17<sup>th</sup> November, producing some flooding.

### **Significant Storms**

#### **Weather event of 1 October – tornado, lightning, and flood producing rainfall**

1 October. High winds, attributed to tornadoes or waterspouts, damaged 35 trees along a 1.2 km stretch in Cornwallis, West Auckland, as well as damaging roofs and fences at about 10 West Auckland properties in Ranui. Lightning occurred with the high winds. Heavy rainfall with widespread surface flooding also occurred, with as much as 50 mm in an hour in parts of Auckland City, and 70-110 mm in 24 hours throughout much of the region.

#### **Weather event of 4-6 October – southerly gales, flood producing rainfall, lightning, and snowfall**

Cold southerly gales (with 6 metre swells and gusts up to 120 km/h) meant that Cook Strait ferry sailings were cancelled for much of the day on the 4<sup>th</sup>, and overnight into the 5<sup>th</sup>. At least 80 flights from Wellington Airport were delayed or cancelled, affecting about 4000 passengers. Large waves through water over train tracks leading out of Wellington, affecting rail services from Wellington to Petone. The same weather event produced lightning strikes in central Wellington, and torrential rainfall in parts of Wairarapa, especially north of Carterton. Surface flooding occurred throughout the Masterton District. More than 25 mm was reported within 30 minutes near Mauriceville on the 3<sup>rd</sup>, with large landslips in the area. Heavy snowfall, up to 30 cm deep, lay on the hills at Matawai in the Gisborne high country on the 6<sup>th</sup>, and up to 15 cm deep in the hills inland from Tolaga Bay. Other parts of Gisborne, Hawke's Bay, and the North Island's Desert Road at 500 m or higher were also affected.

#### **Weather event of 24 October – southerly gales**

More cold southerly gales (with huge more than 8 metre swells and gusts to about 150 km/h) occurred through Cook Strait and Wellington on the 24<sup>th</sup>, following Wellington's wettest Labour weekend in more than a decade. The Interislander ferry Kaitaki, which left Picton at 1.30 p.m, had to shelter in Cloudy Bay, due to the closure of Wellington Harbour, due to high seas, before attempting a crossing toward Wellington. Many flights to and from Wellington Airport were cancelled due to the high winds. Heavy rainfall occurred in parts of Wellington, and a house in Eastbourne had to be evacuated due to a large landslide.

#### **Cold southerly outbreak with hail and late spring snowfall 8-9 November**

Cold southerlies brought snowfall to 200 m in the South Island, including Queenstown and Geraldine on the 8<sup>th</sup>, with hail to other eastern regions, including the central North Island on the 9<sup>th</sup>. Hail damaged some blackcurrant crops at Lowcliffe and Waterton (Canterbury).

### **Windstorms**

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

A wind gust of 176 km/h from the northwest was recorded at Castlepoint on the 19 October, with mean wind speeds reached 126 km/h (hurricane force).

High winds from the southwest buffeted Auckland and parts of Bay of Plenty over 9/10 November. Auckland's Sky tower recording gusts to 150 km/h. Damage occurred to roofs, along with fallen trees and broken power lines (20,000 homes were without electricity). In the Bay of Plenty some of the wind was attributed to tornadoes (most of a roof was lifted off a house and hurled 60m away and the house's chimney destroyed at Waiotahi at 10am on the 9<sup>th</sup>).

Severe northwest gales occurred throughout Canterbury, Marlborough, and the lower North Island on 14 November. A man was killed by a fallen tree in North Canterbury, and about 100 trees had fallen at Hanmer Forest. Power was cut to about 2500 residents. Several roofs were damaged by the wind in Wellington's northern suburbs.

### **Significant soil moisture deficit**

By the end of November significant or severe soil moisture deficits had developed in coastal Bay of Plenty, Gisborne, Hawke's Bay and coastal Marlborough. These were 130 mm or more (severe) in parts of Gisborne and Hawke's Bay, and 110 mm or more in coastal Bay of Plenty, Marlborough and other parts of Gisborne and Hawke's Bay.

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