

## Spring westerlies kick-start September

<b>Rainfall</b>	Spring westerlies produced a very wet month in western regions of the South Island, as well as for Nelson, Southland, and parts of Central Otago. In contrast, it was a dry September in eastern areas of both Islands.
<b>Temperature</b>	A mild September for the lower South Island, as well as north Canterbury, Coromandel, the Hauraki Plains, and the Rodney District. Elsewhere, temperatures were close to September average.
<b>Sunshine</b>	An extremely sunny September for eastern parts of both Islands. Rather cloudy for Westland. Generally close to average sunshine elsewhere.
<b>Soil moisture</b>	At the end of September, soil moisture levels were slightly drier than usual for Taranaki, Waikato, Central Plateau, and parts of the Bay of Plenty, Gisborne, Hawkes Bay, and coastal Wairarapa. Soil moisture levels in Dunedin and across south Canterbury remain above normal.

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### Overview

Spring westerlies arrived during the first few days of September, and prevailed during the first half of the month. These stormy westerly quarter winds produced very wet conditions on the West Coast of the South Island, but in contrast, a rather dry month in eastern areas of both islands. From mid-month, a pattern change saw more anticyclones than usual lie over New Zealand and to the east of the country. This combination of patterns resulted in more northwest winds than normal over New Zealand for the month of September, overall.

The frequent west to northwest winds of September produced a very wet September for western regions of the South Island, as well as for Nelson, much of Southland, and Central Otago, with totals exceeding one and a half times September normal rainfall in these regions. Above normal rainfall

was also observed in eastern parts of Northland. In contrast, it was a rather dry September in eastern areas of both Islands, illustrating the lee effect of westerly winds. In particular, rainfall was less than half of September normal for parts of Gisborne, Hawkes Bay and Canterbury. Below normal rainfall was also experienced between Wanganui and Wellington. Across the remainder of the country, rainfall was generally near normal.

At the end of September, soils were slightly drier than is usual for the time of year for Taranaki, Waikato, Central Plateau, and parts of the Bay of Plenty, Gisborne, Hawkes Bay, and coastal Wairarapa. Soil moisture levels in Dunedin and across south Canterbury remain above normal for the time of year. Elsewhere, soil moisture levels were generally close to normal.

It was a mild September over the lower South Island, as well as for north Canterbury, Coromandel, the Hauraki Plains, and the Rodney District, with temperatures between 0.5°C and 1.2°C above the September average. Elsewhere, temperatures were generally near average. The nation-wide average temperature in September 2012 was 10.8°C (0.4°C above the 1971-2000 September average), using NIWA's seven-station temperature series which begins in 1909. Notably, an unusually cold southerly air stream for the time of year affected New Zealand between 11 and 13 September, with record or near-record low September temperatures observed at many locations. In stark contrast, the last two days of September were extremely warm.

It was an extremely sunny September for eastern areas of both Islands (with sunshine totals typically exceeding 125 percent of September normal), reflecting the high frequency of westerly winds during the month. In contrast, it was a rather dull September for Westland. Elsewhere, sunshine totals were generally close to normal.

Further Highlights:

- The highest temperature was 25.5°C, observed at Waiau on 30 September.
- The lowest temperature was -8.1°C, recorded at Mt. Ruapehu on 13 September.
- The highest 1-day rainfall experienced was 165 mm at Milford Sound on 14 September.
- The highest gust recorded was 169 km/hr at Southwest Cape, Stewart Island, on 6 September.
- Of the six main centres in September 2012, Christchurch was the driest but also the coolest; Wellington was the sunniest, Hamilton the cloudiest, Tauranga the warmest, and Auckland the wettest.

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**Rainfall:** A very wet September for western regions of the South Island, as well as for Nelson, Southland and Central Otago. In contrast, a dry September for eastern areas of both Islands.

The frequent west to northwest winds of September produced a very wet September for western regions of the South Island, as well as for Nelson, much of Southland, and Central Otago, with totals exceeding one and a half times (150 percent of) September normal rainfall in these regions. Above normal rainfall was also observed in parts of Northland (with totals between 120 and 149 percent of September normal). In contrast, it was a rather dry September in eastern areas of both Islands, illustrating the lee effect of westerly winds. In particular, rainfall was well below normal (less than 50 percent of September normal) for parts of Gisborne, Hawkes Bay and Canterbury. Below normal rainfall (between 50 and 79 percent of September normal) was also experienced between Wanganui and Wellington. Across the remainder of the country, rainfall was generally near normal (between 80 and 119 percent of September normal).

**Record or near-record September rainfall totals were recorded at:**

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
<b>Record high or near-record high</b>				
Nelson	151	177	1941	4th-highest
Appleby	163	185	1941	Equal 3rd-highest
Manapouri	202	190	1961	Equal 4th-highest
Lumsden	94	142	1982	3rd-highest
<b>Record low or near-record low</b>				
Wairoa	19	21	1964	2nd-lowest
Mahia	19	29	1990	3rd-lowest

At the end of September, soils were slightly drier than is usual for the time of year for Taranaki, Waikato, Central Plateau, and parts of: the Bay of Plenty, Gisborne, Hawkes Bay, and coastal Wairarapa. Soil moisture levels in Dunedin and across south Canterbury remain above normal for the time of year. Elsewhere, soil moisture levels were generally close to normal.

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**Temperature:** A mild September over the lower South Island, as well as for north Canterbury, Coromandel, the Hauraki Plains, and Rodney.

It was an unusually mild September over the lower South Island, as well as for north Canterbury, Coromandel, the Hauraki Plains, and the Rodney District, with temperatures between 0.5°C and 1.2°C above the September average. Elsewhere, temperatures were generally near average (within 0.5°C of the September average).

The nation-wide average temperature in September 2012 was 10.8°C (0.4°C above the 1971-2000 September average), using NIWA's seven-station temperature series which begins in 1909<sup>1</sup>.

**Record<sup>2</sup> or near-record mean minimum air temperatures for September were recorded at:**

Location	Minimum air temp. (°C)	Departure from normal <sup>3</sup> (°C)	Year records began	Comments
Record high or near-record high				
Alexandra	3.7	1.3	1983	4th-highest
Gore	5.2	1.2	1971	4th-highest

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

Location	Maximum air temp. (°C)	Departure from normal (°C)	Year records began	Comments
Record high or near-record high				
Leigh	18.2	1.8	1966	Highest
Motueka	17.4	1.7	1956	3rd-highest
Cheviot	15.8	0.7	1982	3rd-highest
Ranfurly	14.6	1.5	1975	4th-highest

**Sunshine: An extremely sunny September for eastern parts of both Islands. Rather cloudy for Westland. Generally close to average sunshine elsewhere.**

It was an extremely sunny September for eastern areas of both Islands (with totals typically exceeding 125 percent of September normal), reflecting the high frequency of westerly winds during the month. In contrast, it was a rather dull September for Westland, with sunshine totals around 80 percent of September normal. Elsewhere, sunshine totals were generally close to normal.

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

Location	Sunshine hours	Percentage of normal	Year records began	Comments
Record high or near-record high				
Gisborne	241	133	1905	2nd-highest
Waipawa	210	149	1945	4th-highest
Cheviot	199	138	1983	3rd-highest
Balclutha	174	127	1964	4th-highest

<sup>1</sup> Interim monthly value

<sup>2</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.

<sup>3</sup> This climate summary uses the updated 'normal' period, 1981-2010. (A 'normal' period is a 30 year window of time from which the normal (average) and percentage of normal are calculated from).

## September climate in the six main centres

Of the six main centres, Christchurch was the driest but also the coolest; Wellington was the sunniest, Hamilton the cloudiest, Tauranga the warmest, and Auckland the wettest.

### September 2012 main centre climate statistics:

Temperature			
Location	Mean temp. (°C)	Departure from normal (°C)	Comments
Auckland <sup>a</sup>	12.6	-0.4	Near average
Tauranga <sup>b</sup>	12.8	+0.4	Near average
Hamilton <sup>c</sup>	11.4	+0.1	Near average
Wellington <sup>d</sup>	11.2	+0.4	Near average
Christchurch <sup>e</sup>	9.7	+0.3	Near average
Dunedin <sup>f</sup>	10.5	+1.0	Above average
Rainfall			
Location	Rainfall (mm)	% of normal	Comments
Auckland <sup>a</sup>	92	89%	Near normal
Tauranga <sup>b</sup>	68	81%	Near normal
Hamilton <sup>c</sup>	90	89%	Near normal
Wellington <sup>d</sup>	64	66%	Below normal
Christchurch <sup>e</sup>	32	79%	Below normal
Dunedin <sup>f</sup>	53	109%	Near normal
Sunshine			
Location	Sunshine (hours)	% of normal	Comments
Auckland <sup>a</sup>	164	109%	Near normal
Tauranga <sup>b</sup>	170	98%	Near normal
Hamilton <sup>g</sup>	144	99%	Near normal
Wellington <sup>d</sup>	189	116%	Above normal
Christchurch <sup>e</sup>	184	108%	Near normal
Dunedin <sup>f</sup>	168	125%	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

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## Highlights and extreme events

### Rain and slips

The highest 1-day rainfall experienced in September was 165 mm, observed at Milford Sound on 14 September.

On 3 September, heavy rain caused flooding and property damage in Auckland and Northland. The northbound Esmonde Road onramp to SH1 was flooded, some schools were closed, and flights were delayed.

A slip closed SH6 at the Haast Pass between Haast and Hawea on 6 September.

On 8 September, torrential rain caused a slip, which closed one lane of SH1 south of Paekakariki for about two hours. Parts of Manawatu also suffered surface flooding.

State Highway 1 was closed by a slip at Hihitahi, between Taihape and Waiouru, on 10 September.

On 13 September, after recent heavy rain and snow, a large section of Skippers Canyon Road at Devil's Elbow slipped into the Shotover River, closing the road.

On 16 September, another slip closed SH6 at Makarora. Overnight closures were planned to clear the slip. In the Bay of Plenty, heavy rain caused slips and turned paddocks into lakes.

On 17 September, very heavy rain in Wellington caused surface flooding, affecting commuter traffic. All buses were running 15 minutes late. Slips in Wadestown closed the Johnsonville railway line, and Mairangi Road, with other roads affected by slips. There were reports of heavy water flows blowing off manhole covers.

On 19 September, a large slip came down on SH35 at the new alignment on Maraenui Hill.

### 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
Ranfurlly	24	26 <sup>th</sup>	1943	4th-highest
Manapouri	60	14 <sup>th</sup>	1963	2nd-highest
Lumsden	26	14 <sup>th</sup>	1982	3rd-highest

### Temperatures

The highest temperature recorded in September was 25.5°C, observed at Waiiau on 30 September. The lowest temperature was -8.1°C, recorded at Mt. Ruapehu on 13 September.

An unusually cold southerly air stream for the time of year affected New Zealand on 11 and 12 September, breaking September records at many southeastern sites. Afternoon temperatures on the 12th at Martinborough and Mahia were the coldest on record for September (see Tables next two pages). On the following morning (13 September), ridging produced clear skies and light winds, which resulted in record or near-record low minimum temperatures at numerous locations across

the country. It was a record cold September morning on the 13th at Kerikeri, Warkworth, Whangaparaoa, Rotorua and Te Kuiti. Also notable was the -4.4°C minimum temperature recorded at Christchurch Airport on the 13th, being equal to the second-lowest September temperature in a group of Christchurch stations which date back to 1863.

In stark contrast, the last two days of September were extremely warm, with many sites experiencing near-record September warmth. Cheviot observed 25.1°C on 30 September, a new September record there since records began in 1982, and Dunedin Airport recorded 24.9°C on the same afternoon (equalling the September record there).

**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
<b>High records or near-records</b>				
Paraparaumu	14.0	8th	1972	Equal 2nd-highest
Wellington (Airport)	14.2	8th	1972	2nd-highest
Wanganui	14.3	8th	1972	Equal 4th-highest
Hokitika	12.9	7th	1866	3rd-highest
Greymouth	12.9	7th	1972	Highest
Cheviot	12.7	6th	1982	2nd-highest
Oamaru	13.3	6th	1908	Equal 4th-highest
Ranfurlly	10.9	6th	1975	2nd-highest
Alexandra	12.9	6th	1983	Highest
<b>Low records or near-records</b>				
Kaitaia	2.0	13th	1967	3rd-lowest
Kerikeri	0.9	13th	1981	Lowest
Leigh	4.8	13th	1966	Equal 3rd-lowest
Warkworth	-0.5	13th	1966	Lowest
Whangaparaoa	4.6	12th	1982	Lowest
Whakatane	-1.0	13th	1975	Equal 4th-lowest
Rotorua	-3.2	13th	1964	Lowest
Taupo	-4.7	13th	1949	4th-lowest
Hamilton	-3.5	13th	1906	2nd-lowest
Port Taharoa	2.0	13th	1973	Equal 3rd-lowest
Te Kuiti	-2.4	13th	1959	Lowest
New Plymouth	-1.3	13th	1944	2nd-lowest
Castlepoint	1.2	12th	1972	3rd-lowest
Hicks Bay	2.3	13th	1969	Equal 3rd-lowest
Hokitika	-1.9	12th	1963	3rd-lowest
Haast	-1.5	12th	1949	Equal 3rd-lowest
Motueka	-2.4	12th	1956	2nd-lowest
Cheviot	-2.9	13th	1982	4th-lowest
Christchurch (Airport)	-4.4	13th	1863	Equal 2nd-lowest
Le Bons Bay	0.2	12th	1984	2nd-lowest
Ranfurlly	-5.9	13th	1975	Equal 4th-lowest

**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
<b>High records or near-records</b>				
Kaikohe	21.3	29th	1973	3rd-highest
Leigh	22.8	30th	1966	2nd-highest
Hamilton	22.5	29th	1906	2nd-highest
Te Kuiti	22.1	29th	1959	Equal 3rd-highest
Ngawi	21.6	30th	1972	4th-highest
Wairoa	25.3	30th	1964	4th-highest
Reefton	22.2	29th	1960	3rd-highest
Milford Sound	18.6	29th	1934	Equal 4th-highest
Motueka	23.1	7th	1956	4th-highest
Blenheim	24.6	30th	1941	2nd-highest
Cheviot	25.1	30th	1982	Highest
Ranfurlly	21.7	29th	1975	3rd-highest
Dunedin (Airport)	24.9	29th	1962	Equal highest
Manapouri	20.3	29th	1963	3rd-highest
Lumsden	22.7	29th	1982	2nd-highest
Tiwai Point	21.8	29th	1970	3rd-highest
Balclutha	22.7	25th	1964	4th-highest
<b>Low records or near-records</b>				
Dargaville	12.0	12th	1951	4th-lowest
Whangaparaoa ws	11.7	12th	1982	2nd-lowest
Castlepoint	7.9	12th	1972	2nd-lowest
Martinborough	8.5	12th	1986	Lowest
Gisborne	9.0	12th	1940	2nd-lowest
Mahia	8.5	12th	1990	Lowest
Wanganui	9.9	12th	1987	2nd-lowest
Reefton	7.1	11th	1972	2nd-lowest
Ranfurlly	4.2	11th	1975	3rd-lowest
Dunedin (Airport)	6.1	11th	1972	3rd-lowest
Dunedin (Musselburgh)	6.1	11th	1947	4th-lowest
Manapouri	4.6	11th	1973	4th-lowest
Queenstown	3.2	11th	1871	2nd-lowest
Lumsden	4.4	11th	1982	3rd-lowest



## Wind

The highest wind gust recorded in September was 169 km/hr, at Southwest Cape on 6 September.

On 3 September, strong winds brought down trees in the Bay of Plenty, closing some secondary roads. In Tauranga city, a strong gust blew the head off a Queen Palm tree leaving just a tall stump. On 4 September, a wind warning was issued for SH87 between Outram and Middlemarch.

On 5 September, wind warnings were issued for SH1 between Waikouaiti and Milton, SH8 between Fairlie and Twizel, and SH80 between Pukaki and Mt Cook. In the Mackenzie Country, the wind closed Mt Dobson ski field, with snow drifts blown on to the access roads. At the Remarkables, the Freeski Open of New Zealand final was delayed after strong winds closed the ski field.

On 6 September, strong winds brought down power lines in Balclutha, and uprooted trees at Whataroa on the West Coast. Wind warnings were issued for SH73 at Porters Pass. The Lux-Mini Light Festival on the Wellington waterfront was closed early because of the strong winds.

On 7 September, strong winds battered Wellington, bringing down power lines and trees, cutting power to some northern suburbs.

On 8 September, strong winds closed SH2 over the Rimutaka Ranges. Flights at Wellington Airport were cancelled, delayed or diverted. Power poles, telephone lines and trees were brought down, trampolines were sent flying, roofs were lifted, and in the central city, the wind forced a window at the Amora Hotel to crash onto Wakefield Street, and a large sign on Dixon Street was uplifted, smashing into a car, breaking its windscreen. Gusts caused powerlines to clash, resulting in about 6000 homes in Upper Hutt, and another 700 in Wainuiomata, losing power for several hours. In Taranaki, high winds brought down trees and cut power to 1600 homes. A Stratford supermarket had to close for more than an hour when glass panels on the entrance roof were lifted by the wind. Trees were also brought down in Manawatu, while in Wairarapa, power lines were downed and roofs lifted. Wind warnings were issued for SH1 between Blenheim and Kaikoura.

On 10 September, wind warnings were issued for SH1 between Allanton and Gore, SH8 between Clarksville and Raes Junction, SH73 at Porters Pass, SH87 between Outram and Kyeburn, and SH90 between Raes Junction and Gore. In Invercargill, trampolines were sent flying and trees toppled, and power cuts were reported in Winton, Otatara and Invercargill. In central Tauranga, a large waka sail on a stainless steel pole, blew over in strong winds blocking the railway line.

On 11 September, wind warnings were issued for SH1 between Balclutha and Gore. In the Hutt Valley, a roof was blown off a home, cutting power to neighbouring houses.

On 14 September, wind warnings were issued for SH8 between Fairlie and Twizel, SH73 at Porters Pass, and SH80 between Pukaki and Mt Cook Village.

On 17 September, strong winds in Christchurch uprooted a large tree growing on the Avon River bank. In Queenstown, the wind disrupted flights, with some planes diverted to Dunedin, or returned to Christchurch.

### 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
Tauranga	98	9th	1973	3rd-highest
Taupo	80	8th	1982	4th-highest
Baring Head	143	8th	1991	Equal 3rd-highest
Wellington (Airport)	128	8th	1972	Equal 4th-highest
Kaikoura	122	17th	1972	Equal 3rd-highest
Oamaru	80	4th	1984	4th-highest

### Lightning and hail

On 4 September, Christchurch had thunder, lightning and a severe hailstorm in the early evening. Conservatories and cars were damaged, power was lost to some suburbs, and one flight was delayed. Thunderstorms were also reported in Buller, Northland, Wellington and the Waikato.

On 8 September, a lightning storm in Manawatu caused a brief power outage in Wellington City. It occurred at half time in the rugby match between New Zealand and Argentina, causing a 30 minute delay as the lights had to cool down before being restarted. Hail storms also passed through Manawatu.

On 9 September, Hamilton and the surrounding region experienced thunder, lightning, and torrential downpours of hail, damaging cars.

On 11 September, hail fell in Wellington and Palmerston North.

On 17 September a fast-moving front brought thunderstorms to mid-Canterbury.

### Snow and ice

On 5 September, SH94 was closed between Te Anau and Milford Sound because of the danger of avalanche caused by snow melt. It remained closed on 6 and 7 September.

On 9 September, snow fell on SH73 between Arthurs Pass and Otira, closing the road to towing vehicles, with chains required on all other vehicles.

On 10 September, heavy snow closed SH94 between Te Anau and Milford Sound. Chains were required on SH73 between Arthurs Pass and Otira, and the road was closed to towing vehicles.

On 11 September, SH94 remained closed by snow, Chains were essential on SH7 at the Lewis Pass, SH6 between Athol and Lumsden, SH94 between Mossburn and Te Anau, and the Crown Range Road between Arrowtown and Wanaka. These roads were closed to towing vehicles. Snow also affected SH1 between Balclutha and Gore, SH93 between Clinton and Matakura, SH6 between Kingston and Arrow Junction, and SH6A between Frankton and Queenstown, where chains had to be carried. The snow closed Queenstown Airport with about 30 flights diverted. Garston School was closed for the day, with 13 cm of snow measured at the school. In Dunedin, snow in the hill suburbs delayed starting times for schools and kindergartens with some high roads closed, and later in the day traffic in the hill suburbs came to a halt when hail stones froze on roads in the late afternoon. Taxis

stopped running to the hill suburbs about 7 pm, and bus services were affected by sleet, snow and hail all day. SH1 was closed between Rangipo and Waiouru in the late afternoon.

On 12 September, snow closed SH2 over the Rimutaka Ranges from early morning. Extreme care was required on SH25, the Napier-Taupo road. Further south, SH87 between Outram and Middlemarch and SH94 from Te Anau to Milford Sound were closed, and chains were required on SH73 at Porters Pass. Residents on Wellington's hill suburbs reported snow falling but not settling. Snow was also reported around Palmerston North and in Norsewood.

On 14 September, SH94 remained closed by snow at the Lower Hollyford turn-off to Milford Sound.

### **Cloud and fog**

On 17 September, fog caused delays at Christchurch Airport.

On 28 September, fog caused flight cancellations at Gisborne Airport.

On 29 and 30 September, fog rolled across Hawkes Bay, causing cancellations and delays at Napier Airport.

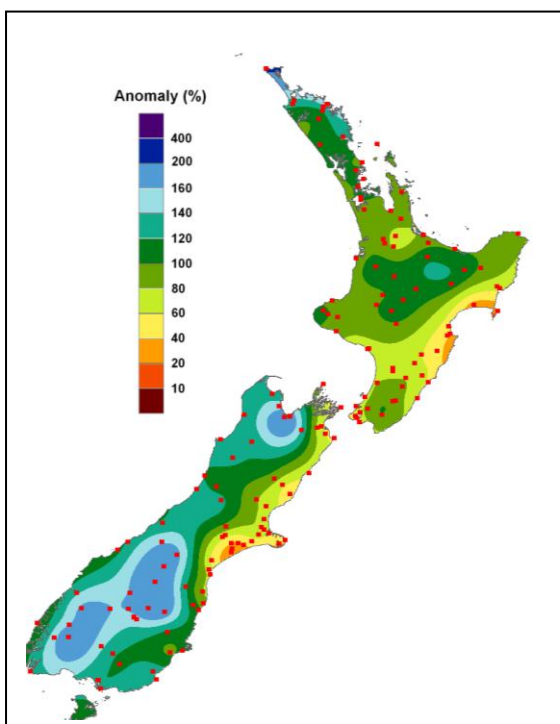
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*September 2012 rainfall, expressed as an anomaly from normal September conditions (percent of September normal rainfall). The teal colour indicates September rainfall exceeding 120 percent of September normal, such as in seen over the north, west, and south of the South Island. In contrast, an orange colour indicates rainfall less than 40 percent of September normal (as seen in parts of Canterbury, Hawkes Bay and Gisborne).*