

National Climate Summary – Autumn 2008: a season of extremes – heatwaves, drought, floods and frost

- **Rainfall: Well below normal in alpine areas and the west and south of the South Island**
- **Soil moisture: Significant deficits in western areas of the North Island**
- **Temperature: Above average in the north and west, below average in Otago**
- **Sunshine: Well above normal in west and south of the South Island**

Low rainfall occurred in the alpine areas and west of the South Island, with one of the driest autumn's on record. It was very dry and sunny in the west and south of the South Island and Manawatu. Mean autumn air temperatures were above average in the north and west of both islands, but below average in Otago. The national average temperature of 13.3 °C was exactly average for autumn. But in the South Island unusual in March, and May brought extended periods of frost. It was extremely sunny in the west and south of the South Island.

Rainfall was about 50 percent (half) of normal in alpine areas and in South Westland, Fiordland, and less than a quarter of normal in Timaru. Unusually, significant soil moisture deficits (at least 110 mm) persisted until the end of March in many western North Island areas, dramatically affecting dairy production. Seven people drowned in a river flood in April, whilst May was unusually windless and extremely dry in many South Island places. The overall autumn climate pattern was dominated by more anticyclones to the south and southeast of the South Island, and depressions northwest of the North Island, producing more easterlies and northeasterlies.

Major Highlights:

- The highest temperature during autumn 2008 was 34.8 °C recorded at both Timaru Airport, and 35°C (rounded to the nearest degree) at Culverden and Woodbury on March 19th. This was 1°C less than the highest ever New Zealand March temperature of 36°C recorded at Ashburton in 1956. Heatwave conditions occurred from 18-21 March in inland and eastern South Island areas, with temperatures of 30°C or more, and many locations recording their highest March temperatures on record.
- The lowest air temperature during the month was -7.7°C recorded at Albert Burn in Central Otago on May 5th under clear skies. It was much frostier than normal in May, with ground frosts of 5°C or more occurring on 24 days in some inland areas.
- April produced several high rainfall/flood-producing events – the worst being that of 14-16 April with 132 mm in 24 hours in Takaka on 14 April, 126 mm at Matamata, 108 mm at Rotorua and 101 mm at Taupo on the 15th – the deluge caused flooding of homes in Rotorua, and a river flood on the Mangetopopo drowning seven people, and earlier in the day a man was struck by lightning and killed near Dargaville. On 29 and 30 April 40 mm at Paraparaumu, 95 mm at North Egmont, and 94 mm in Wellington caused flooding in the Okato, the Kapiti Coast and Wellington.
- By 29th March severe and significant soil moisture deficits (more than 130 and 110 mm) were present in throughout the west of the North Island from Auckland to the Manawatu, east of North Island, and the east of the South Island. The combination of the hot and dry conditions meant that dairy farmers continued drying off dairy stock, with sheep farmers selling stock early. April rainfall ended the severe and significant soil moisture deficits.
- Of the five main centres, Auckland was easily the warmest, Wellington by far the wettest, Hamilton the sunniest and Christchurch the driest. Autumn temperatures were above average in Hamilton and Wellington, and below average in Christchurch. Rainfall was well above normal in Wellington, near normal in Auckland, and below normal in the three other centres. Autumn sunshine was near normal in Auckland and Christchurch, and above normal in Hamilton, Wellington and Dunedin.

Rainfall: Autumn rainfall was about 50 percent (half) of normal in alpine areas and south Westland, Fiordland, and less than a quarter of normal around Timaru. Cape Reinga record almost 200 percent (double) normal rainfall, and 150 percent (one and a half times) normal rainfall occurred in eastern Bay of Plenty, parts of the east of the North Island and Wellington.

Temperature: Seasonal mean temperatures were about 0.5 °C above average throughout the north and west of both islands. They were closer to average in other North Island areas, and below average but about 0.5°C in Marlborough, Canterbury and Central Otago.

Sunshine: Autumn sunshine hours and/or solar radiation were at least 110 percent of normal in the southwest of the North Island, the west, south and alpine areas of the South Island. Southern and alpine areas received totals in excess of 120 percent of normal. Only in Gisborne were totals less, being 90 percent of normal.

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RAINFALL: WELL BELOW NORMAL IN THE EAST, INCLUDING MANAWATU AND WELLINGTON

Autumn rainfall was about 50 percent (half) of normal in alpine areas and south Westland, Fiordland, and less than a quarter of normal around Timaru. Except in Marlborough and eastern Otago, rainfall totals in the remainder of the South Island were between 50 percent (half) and 75 percent (three-quarters) of normal. Cape Reinga record almost 200 percent (double) normal rainfall, and 150 percent (one and a half times) normal rainfall occurred in eastern Bay of Plenty, parts of the east of the North Island and Wellington. Rainfall totals were closer to normal in other North Island areas.

Near or record autumn rainfall totals were recorded at:

Location	Autumn 2007 rainfall (mm)	Percentage of normal	Year Records began	Comments
Cape Reinga	510	196	1920	2 nd highest
Whakatane Airport	434	159	1975	Well above average
Mahia	444	173	1991	4 th highest
Timaru Airport	37	23	1951	2 nd lowest

TEMPERATURE: ABOVE AVERAGE IN THE NORTH AND WEST OF BOTH ISLANDS, BELOW AVERAGE IN INLAND AND EASTERN SOUTH ISLAND

Seasonal mean temperatures were about 0.5 °C above average throughout the north and west of the North Island, Nelson, and the South Island west coast. They were closer to average in other North Island areas, and below average but about 0.5°C in Marlborough, Canterbury and Central Otago. The national average temperature of 13.3°C was exactly average for autumn.

SUNSHINE: WELL ABOVE NORMAL IN WESTERN AREAS AND SOUTHERN NEW ZEALAND

Autumn sunshine hours and/or solar radiation were at least 110 percent of normal in the southwest of the North Island, the west, south and alpine areas of the South Island. Southern and alpine areas received totals in excess of 120 percent of normal. Only in Gisborne were totals less, being 90 percent of normal.

AUTUMN CLIMATE IN THE FIVE MAIN CENTRES

Of the five main centres, Auckland was the warmest, Wellington by far the wettest, Christchurch the driest and Hamilton the sunniest. Autumn temperatures were above average in Hamilton and Wellington, and below average in Christchurch. Rainfall was well above normal in Wellington, near normal in Auckland, and below normal in the three other centres. Autumn sunshine was near normal in Auckland and Christchurch, and above normal in Hamilton, Wellington and Dunedin.

Location	Autumn Mean Temp. (°C)	Dep. from normal (°C)		Autumn rainfall (mm)	% of normal		Autumn Sunshine (hours)	% of normal	
Auckland ^a	16.5	+0.2	Near average	288	95	Near normal	518	108	Near normal
Hamilton	14.7	+0.3	Above average	230	84	Below normal	520	108	Above normal
Wellington	14.1	+0.4	Above average	480	156	Well above normal	531	112	Above normal
Christchurch ^b	11.5	-0.5	Below average	118	74	Below normal	500	103	Near normal
Dunedin	11.7	+0.1	Near average	187	93	Below normal	424	117	Well above normal

a Mangere, b Christchurch Airport

HIGHLIGHTS AND EXTREME EVENTS

- **Temperature**

The highest temperature during autumn 2008 was 34.8 °C recorded at both Timaru Airport, and 35 °C (rounded to the nearest degree) at Culverden and Woodbury on March 19th. This was 1 °C less than the highest ever New Zealand March temperature of 36 °C recorded at Ashburton in 1956. From the March 18th to the 21st heatwave conditions occurred in inland and eastern South Island areas, with temperatures of 30 °C or more, and many locations recording their highest March temperatures on record.

The lowest air temperature during the month was -7.7 °C recorded at Albert Burn in Central Otago on May 4th under clear skies. It was much frostier than normal in May, with ground frosts of 5 °C or more occurring on 24 days in some inland areas.

- **Drought**

By 29th March severe soil moisture deficits (more than 130 mm) were present in parts of Auckland, Waikato, South Taranaki, Manawatu, Wairarapa and Marlborough. Significant soil moisture deficits (more than 110 mm) persisted throughout much of the west of the North Island, and from the Heretaunga Plains to Wairarapa, and in the east of the South Island. The combination of the hot and dry conditions meant that dairy farmers continued drying off dairy stock, with sheep farmers selling stock early. The stock feed situation remained very low in the drought areas. April rainfall ended the severe and significant soil moisture deficits in much of the North Island and May rains in other areas.

- **High rainfall**

30 March: Heavy drought breaking rain occurred in Taranaki on the 30th with 100 mm at Stratford.

4 April: A localised deluge of 25 mm between 8.00 and 9.15 pm brought flash flooding in Greymouth.

14-16 April: A low over the Tasman Sea with a front moved over Nelson and the North Island and produced heavy rainfall and flooding in Northland, Bay of Plenty, Central North Island and Nelson. It caused 8 deaths, one from a lightning strike, and seven in a river flood. On the 14th in the Nelson area 132 mm in 24 hours in Takaka, and 99 mm at Appleby caused isolated slips and floods briefly. On the 15th in Northland 55 mm occurred in an hour in the Hokianga, with 94 mm in 3 hours. A man and his horse were

struck by lightning and killed near Dargaville. The Opononi area school was closed and evacuated. A lightning strike near Kaitaia caused the Doubtless Bay area to be without power for 3 hours. Further south, 1-day totals of 126 mm at Matamata, 108 mm at Rotorua Airport and 101 mm at Taupo caused flooding and slips. The deluge caused flooding of some homes in Rotorua and car crashes, with a two metre high wall of water sweeping down an Otonga hillside. The deluge in Tongariro National Park caused a river flood on the Mangatepopo stream 25 km west of Turangi drowning seven people. Further heavy rainfall in the eastern Bay of Plenty and near East Cape produced 120 to 130 mm in the hill country with minor slips on SH2. The highest 1-day rainfall was 132 mm recorded at Takaka on the 14th.

29-30 April: A trough passing over New Zealand produced further heavy rainfall, with flood damage around coastal in Northland, Taranaki and Kapiti. A 40 mm rainfall occurred at both Paraparaumu and New Plymouth between 10 pm on the 29th and 3 am on the 30th, with 95 mm at North Egmont. A number of houses were severely damaged near Okato when the Stony River burst its banks, with widespread damage to farms to the south. Floodwaters swept through 10 shops and several houses on the Kapiti Coast. In Wellington 94 mm on 30th April occurred with fire fighters being called out 40 times to weather-related incidents, with most incidents involving surface flooding.

- **Snowfall**

Snow fell on the Napier-Taupo highway overnight on May 5th.

On May 23-24th snowfall occurred across the alpine regions of the South Island with many ski fields reporting their first significant snow fall for the season. Reports of between 10-40 cm were not uncommon, with areas in central Otago receiving the most (e.g. Coronet Peak, The Remarkables, Cardrona and Treble Cone). Snow fall data collected at one of our new NIWA snow monitoring sites supported these reports with up to 48cm recorded at Albert Burn - a site situated at about 1280m and about 30km north of Treble Cone and about 20km east of Mt Aspiring.

- **High winds and tornadoes**

A tornado on 1st April hit Ngakawau, near Westport at 5.10 pm tearing the roof off a workshop, blowing in windows and snapping a power pole. Wind speeds were estimated at 180-200 km/h.

Another tornado on 30th April occurred at 3.30 am across forests and farmlands between Te Haroto and Tarawera about 60 km northwest of Napier. It uprooted some trees and snapped power poles, cutting power to 100 homes for a few hours.

The highest wind gust for the season was 183 km/h at Mokohinau Island on May 11 in strong easterly conditions.

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