

10 JANUARY 2006

NEW ZEALAND NATIONAL CLIMATE SUMMARY - THE YEAR 2005

***2005: MUCH WARMER, WITH MORE ANTICYCLONES AND LESS WIND THAN NORMAL
VERY LOW RAINFALL IN THE SOUTH ISLAND
CATASTROPHIC FLOODS AND EXTREMELY HIGH RAINFALL IN BAY OF PLENTY;
DESTRUCTIVE TORNADOES; AN UNSEASONABLY LATE SNOWSTORM***

New Zealand's climate for 2005 was marked by too little rain in some places, and too much in others. Principal scientist Dr Jim Salinger of the NIWA National Climate Centre, says "Rainfall during the year was less than 75 percent of normal over much of the South Island whereas severe flooding in the Bay of Plenty in May caused widespread damage. "The national average temperature of 13.1°C made 2005 the fourth warmest year nationally since reliable records commenced in the 1860s. Only 1971, 1998 and 1999 have been warmer with temperatures of 13.2, 13.3 and 13.3 °C respectively. Notable climate features in various parts of the country included heat-waves, low soil moisture, the Greymouth tornado, an unseasonable snowstorm, and damaging hailstorms. The year was dominated by more anticyclones with less wind than average, although more easterlies at times occurred on to the north east of the North Island."

"A weak El Niño prevailed in the equatorial Pacific during the first part of the year. More anticyclones in January commenced the trend of low rainfall and severe or significant soil moisture deficits in the northern half of the North Island and Canterbury; these conditions persisting into April. Anticyclones and northeasterlies brought one of the warmest Februaries on record, with maximum temperatures of 30°C or more in many locations throughout New Zealand, and temperatures of 35°C or more in sheltered inland areas of the South Island during the first 10 days. March was wetter in the North Island, but more anticyclones in April kept conditions dry. However, weather patterns changed abruptly in May. The Bay of Plenty floods of 3-4 May and 17-18 May were most disastrous, the earlier of the two causing widespread damage in parts of Tauranga, and the later being phenomenal, with unprecedented high-rainfall for the district and a state of emergency declared from Tauranga to Matata. Hundreds of people were evacuated. Homes were destroyed by mudslides and floodwaters and rising waters threatened hundreds of others. Flooding was extreme in Matata, where a stream became a torrent of water, mud, huge boulders, and debris", says Dr Salinger.

Halfway through the year, more frequent anticyclones over the North Island and north westerlies over the South Island produced the sixth warmest winter on record, with extremely dry conditions in the east of the South Island. "Winter snowfall was much less frequent than normal. However, an early spring occurrence (on 19 September) to sea level in Canterbury was unusual for the month", says Dr Salinger. This resulted in the closure of Christchurch Airport, along with schools and universities, with snow depths of 5-10 cm in the region. Power cuts also occurred. Hundreds of newborn lambs died in the cold.

More anticyclones over New Zealand continued into early spring, with milder conditions and below average spring rainfall, which resulted in significant soil moisture deficits developing much earlier than usual from Southland to Marlborough, and spreading to Nelson and the southwest of the North Island in November, and developing in Hawke's Bay, Auckland, and parts of Northland in December. However southeasterlies in both October and November produced significant flooding in Gisborne. Patterns changed with warm northerlies producing the 3rd warmest December month.

“For the year there were at least 26 heavy rainfall events, half of which produced floods,” said Dr Salinger. There were also seven damaging hailstorms, and twelve damaging tornadoes (or events attributed to tornadoes) in 2005,” said Dr Salinger. The Greymouth tornado of 10 March was particularly destructive for a New Zealand occurrence, leaving 30 people homeless, and resulting in damage worth at least \$10 million. Wellington Airport was closed for many more hours than usual in 2005. There were 52 hours with fog there, the highest for any year in 45-years of measurement.

NIWA analyses of month-by-month records and preliminary end of year data show:

The year’s national average temperature of 13.1 °C (0.5 °C above the 1971-2000 normal), was the fourth warmest nationally since reliable records commenced in the 1860s.

The highest annual mean temperature recorded for the year was 16.1 °C recorded at both Cape Reinga and Whangarei Airport.

The highest recorded extreme air temperature for the year was 38.7 °C recorded at Alexandra on 5 February (the highest temperature there for any month, in records back to 1929). This is only one a few occasions when temperatures in New Zealand have exceeded 100 °F (37.8 °C).

The highest temperatures during August 2005 were 25.1 °C recorded at Hanmer Forest on the 30th, and 25.4 °C recorded in Amberley on the 31st. These both exceeded the previous all-time New Zealand maximum temperature record for August.

The lowest temperature for the year was -9.5 °C, recorded at Ophir (Central Otago) on 17 July. February was the 8th warmest on record.

June was the coldest in a decade.

July was the 3rd warmest on record.

August was the 4th warmest on record.

December was the 3rd warmest on record.

The driest rainfall recording locations were Clyde in central Otago with 348 mm of rain for the year, followed by Lake Tekapo with 352 mm.

Christchurch was easily the driest of the four main centres with 450 mm and Auckland the wettest with 1112 mm. Wellington received 975 mm and Dunedin 647 mm.

Of the regularly reporting gauges, the Cropp River gauge in Westland, inland in the headwaters of the Hokitika River, recorded the highest rainfall with a 2005 annual total of 9290 mm.

Nelson was the sunniest centre in 2005, recording 2571 hours, followed by Tauranga with 2495 hours, then Blenheim with 2466 hours. Auckland was easily the sunniest of the four main centres with 2254 sunshine hours, followed by Wellington (2211 hours) and Christchurch (2055 hours). Dunedin recorded 1807 hours.

The highest recorded wind gust for the year was 174 km/h from the northwest, recorded at Southwest Cape (Stewart Island) on 3 April.

PREVAILING CLIMATE PATTERNS – A WEAK EL NIÑO EARLY IN THE YEAR

Overall, mean sea level pressures were above average over much of New Zealand, with more anticyclones (‘highs’) than average in the Tasman Sea and to the east of the South Island. This pattern resulted in less wind than is normal over much of New Zealand. February, March, May, and December were the only months when more lows (cyclonic anomalies) occurred over New Zealand. Low pressure systems prevailed in the Tasman Sea and over central New Zealand during those months.

A weak El Niño prevailed in the equatorial Pacific during the first half of the year. Sea temperatures around New Zealand were 0.5°C above average, being warmer than normal in all months except January.

EXTREMELY LOW RAINFALL OVER MUCH OF THE SOUTH ISLAND; HIGH RAINFALL IN BAY OF PLENTY AND HAWKE'S BAY

2005 was one of the driest on record in parts of Marlborough and Canterbury, as well as in eastern Northland, Nelson, and parts of the West Coast. In contrast, it was one of the wetter years on record in parts of Bay of Plenty, and Hawke's Bay. The year was much drier than average (with totals less than 75 percent of normal) throughout much of the South Island. Totals were also below average (75 to 90 percent of normal) in the north and west of the North Island from Northland to Wellington (excluding Wanganui), as well as southern Wairarapa. However, rainfall was well above average (more than 125 percent of normal) in western Bay of Plenty, Hawke's Bay, and the far southwest of the South Island. Rainfall was near normal elsewhere.

Extremely low annual rainfall, for the year 2005, was measured at:

Location	2005 rainfall (mm)	Percentage Of normal	Year Records began	Comments
Whangarei Airport	984	66	1937	2 nd lowest
Takaka	1315	59	1986	Lowest
Reefton	1298	65	1961	Lowest
Franz Josef	3757	64	1983	Lowest
Motueka	895	64	1943	2 nd lowest
Nelson Airport	644	68	1941	Lowest
Appleby	646	65	1932	2 nd lowest
Blenheim Airport	506	70	1941	2 nd lowest
Hanmer Forest	698	59	1905	3 rd lowest
Mt Cook Village	2701	63	1930	3 rd lowest
Darfield	484	61	1920	Lowest
Lake Tekapo	352	59	1927	2 nd lowest
Tara Hills	366 ^a	69	1950	Lowest
Wanaka Airport	444	63	1993	Lowest

^a 4-days missing

High annual rainfall, for the year 2005, was measured at:

Location	2005 rainfall (mm)	Percentage of normal	Year Records began	Comments
Tauranga Airport	1681	139	1898	Well above average
Napier Airport	1055	127	1951	3 rd highest
Puysegur Point	2659	130	1994	Well above average

Of the four main centres, Christchurch (Airport) was the driest with 450 mm (69% of average) and Auckland the wettest with 1112 mm (90% of average). Wellington received 975 mm (78%) and Dunedin 647 mm (80%).

Clyde, in Central Otago, was the driest of the sites where NIWA records rainfall, with only 348 mm (76% of average), followed by Lake Tekapo with 352 mm (59% of average). Of the regularly reporting rainfall stations, the wettest location in 2005, for which rainfall data are presently available was the Cropp River gauge in Westland, inland in the headwaters of the Hokitika River, with an annual total of 9290 mm.

2005 MUCH WARMER THAN NORMAL

The national average temperature in 2005 was 13.1 °C, 0.5 °C above the 1971 – 2000 normal. It was the fourth warmest year nationally since reliable records commenced in the 1860s. Only 1971, 1998 and 1999 have been warmer with temperatures of 13.2, 13.3 and 13.3 °C respectively. For New Zealand as a whole, there were seven warmer than normal months (February, March, May, July through September, and December), two cooler (January and April) and three months with mean temperatures close to the climatological average (June, October and November). February with a mean temperature of 18.6 °C (1.3 °C above normal) was the 8th warmest on record, July with 9.1 °C (1.2 °C above normal) was the 3rd warmest on record, August with 9.8 °C (1.1 °C above normal) was the 4th warmest on record, and December with 17.5 °C (1.9 °C above normal) was the 3rd warmest on record. 2005 mean temperatures were at least 0.3 °C above average in most regions, and 0.5 to 0.9 °C above average in parts of Auckland, Coromandel, western Bay of Plenty, the west of the North Island from Wanganui to Wellington, as well as Wairarapa, and much of the South Island. Temperatures were near average in coastal Wairarapa, along the Kaikoura Coast, and in coastal areas of south Canterbury. The warmest locales were Cape Reinga and Whangarei Airport, both with a mean temperature for the year of 16.1 °C (0.2 and 0.5 °C above normal respectively).

Well above normal mean temperatures for the year 2005 were measured at:

Location	Mean temperature (°C)	Departure from normal	Year Records began	Comments
Dargaville	15.6	+0.6	1944	3 rd highest
Auckland, Henderson	15.7	+0.6	1986	3 rd highest
Pukekohe	15.3	+0.8	1971	2 nd highest
Motu	11.7	+1.1	1995	Highest
Chateau Ruapehu	8.2	+0.8	1933	Equal 2 nd highest
East Taratahi	13.0	+0.9	1973	Well above normal
Wanganui	14.7	+0.8	1938	Highest
Palmerston North	13.9	+0.6	1928	Equal 2 nd highest
Wallaceville	13.1	+0.7	1940	Equal 3 rd highest
Kelburn, Wellington	13.5	+0.6	1928	Equal 3 rd highest
Farewell Spit	14.5	+1.1	1972	Highest
Nelson Airport	13.4	+0.9	1944	3 rd highest
Blenheim Research	13.6	+0.6	1987	Equal 2 nd highest
Tara Hills, Omarama	10.2	+0.8	1950	2 nd highest
Wanaka Airport	11.4	+0.7	1993	Highest
Queenstown	11.6	+0.9	1872	2 nd highest
Lauder	10.5	+0.9	1982	Highest
Clyde	11.2	+0.7	1984	Equal highest
Invercargill Airport	10.7	+0.8	1949	Equal highest
Campbell Island	7.5	+0.4	1944	3 rd highest

SUNNY IN MANY WESTERN REGIONS, AS WELL AS SOUTHERN REGIONS OF THE SOUTH ISLAND, NEAR NORMAL ESLEWHERE

Sunshine hours were more than 110 percent of normal in Northland, Auckland, Buller, Westland, Southland, and coastal Otago, and at least 105 percent of normal in Taranaki, Gisborne, Hawke's Bay, Wairarapa, Manawatu, Kapiti, Wellington, Nelson, and inland areas of south Canterbury. They were near normal in all other regions.

/4 of 22 pages

Nelson was the sunniest centre in 2005, recording 2571 hours, followed by Tauranga with 2495 hours, and then Blenheim with 2466 hours.

Total sunshine hours for the year 2005 in selected main centres were:

Location	2005 Sunshine (hours)	Normal (hours)	Departure from normal	Comments
Auckland	2254	2019	+12%	Highest for Mangere, records began in 1963
Wellington	2211	2064	+7%	Above normal
Christchurch	2055	2100	-2%	Near normal
Dunedin	1807	1597	+13%	Above normal
Invercargill	1785	1609	+11%	Above normal
Tauranga Airport	2495	2250	+11%	3 rd highest, records began in 1933
New Plymouth	2377	2171	+9%	Highest since 1943, records began in 1916

For further information, please contact:

Dr Jim Salinger, NIWA - Auckland,

Tel (09) 375 2053 (Business) or (027) 521 9468 (Mobile)

Stuart Burgess – Climatologist, NIWA National Climate Centre, Wellington Tel. (04) 386 0569

© Copyright NIWA 2006. All rights reserved.

Acknowledgement of NIWA as the source is required.

/5 of 22 pages

SIGNIFICANT WEATHER AND CLIMATE EVENTS - 2005

LOW SOIL MOISTURE LEVELS AND RECORD LOW MONTHLY RAINFALL

January

Soil moisture deficits became severe in Gisborne, Hawke's Bay, and north Canterbury, and developed in Northland, Auckland, Bay of Plenty, Taranaki, Wanganui, and Wairarapa. Rainfall was well less than 25 percent of normal in eastern Bay of Plenty, and less than 50 percent of normal in western Bay of Plenty and throughout much of Northland, Auckland, Coromandel, the Kaikoura Coast, and in north Canterbury.

February

Severe soil moisture deficits persisted in Gisborne and Hawke's Bay, spreading to Bay of Plenty, Wairarapa, Wanganui, Marlborough, and north Canterbury, and were significant in parts of Northland, Auckland, Thames, Taupo, Manawatu, Horowhenua, Kapiti, Wellington, Nelson. Water restrictions occurred in Taranaki, with total bans on sprinklers, irrigation systems and unattended hoses. Rainfall was less than 25 percent of normal in parts of Hawke's Bay, and less than 50 percent of normal in inland and eastern Bay of Plenty, Gisborne, Manawatu, and Wairarapa.

March

Soil moisture deficits were significant in Northland, Auckland, Waikato and Coromandel, as well as the southwest of the North Island from Wanganui to Horowhenua, and Marlborough, Canterbury, and Otago, until the last week of March. Rainfall was less than 25 percent of normal throughout much of Northland, and less than 50 percent of normal in parts of Auckland.

April

Soil moisture deficits were severe in Northland, with significant deficits in Auckland, Horowhenua, the Kapiti coast, Marlborough, and parts of Canterbury. Much of Northland has had only 20 to 30 mm of rainfall since the end of February. Rainfall was less than 25 percent of normal throughout much of Northland, parts of Auckland, Coromandel, Bay of Plenty, Nelson and central Marlborough, with many locations recording totals less than 10 mm. Totals were less than 50 percent of normal in Waikato, Taranaki, Marlborough, Buller, Westland and Fiordland.

August

A lack of rainfall resulted in significant soil moisture deficits for the time of year in northern and eastern Otago and South Canterbury. Rainfall was less than 25 percent of normal rainfall in much of Canterbury, coastal Otago, Wairarapa and Wellington, less than 50 percent of normal in much of Northland, Auckland, Wanganui, Manawatu, Hawke's Bay, Marlborough, and Nelson.

September

A lack of substantial rainfall in North and Central Otago and South Canterbury (less than 25 mm for the month in some areas) resulted in a continuation of significant soil moisture deficits. Fire bans existed in parts of Canterbury and Otago at the start of the month. Rainfall was well below average in parts of Nelson. Appleby's rainfall totalled 9 mm (11 percent of normal), and was the lowest September total in more than 70 years of measurement. Rainfall was less than 50 percent of normal in Gisborne and Marlborough.

October

Significant soil moisture deficits existed in Marlborough, south Canterbury and much of Otago.

November

Little rainfall occurred in many regions during the first two to three weeks of November. Rainfall was well below normal throughout much of the north and west of both islands, and less than 25 percent (quarter) of normal rainfall was recorded in Kapiti, and Golden Bay. Paraparaumu Airport and New Plymouth Airport, both recorded their driest November in at least 60 years. As a result, significant soil moisture deficits occurred in eastern regions from southern Wairarapa to Otago, as well as Kapiti, Wellington, and Nelson.

December

Significant soil moisture deficits persisted in eastern regions, occurring from Hawke's Bay to Otago, as well as Kapiti, Wellington, and Nelson. Deficits were severe in parts of Marlborough and Central Otago.

Some locations measured unusually low rainfall at various times during the year. These were:

Location	Rainfall (mm)	Percentage of normal	Year Records began	Comments
January				
Warkworth	32	35	1973	3 rd lowest
Whangaparaoa	27	29	1989	2 nd lowest
Henderson, Auckland	28	30	1986	2 nd lowest
Taupo Airport	13	17	1977	2 nd lowest
Port Taharoa	13	18	1975	Lowest
February				
Whakatu	10	16	1983	3 rd lowest
March				
Kaitaia Observatory	7	10	1986	Lowest
Kerikeri	26	21	1982	2 nd lowest
Kaikohe	16	15	1973	3 rd lowest
Whangarei Airport	16	12	1937	2 nd equal lowest
April				
Cape Reinga	10	9	1920	2 nd lowest
Kaitaia Observatory	17	20	1986	2 nd lowest
Kerikeri EWS	21	17	1982	Lowest
Kerikeri Airport	11	9	1978	Lowest
Kaikohe	13	10	1973	Lowest
Whangarei Airport	5	4	1937	Lowest
Mokohinau Island	13	11	1935	3 rd lowest
Warkworth	22	19	1972	Lowest
Whangaparaoa AWS	24	30	1987	2 nd lowest
Auckland, Owairaka	20	19	1949	2 nd lowest
Whitianga Airport	13	9	1991	Lowest
Paeroa	19	17	1914	2 nd lowest
Tauranga Airport	14	12	1898	2 nd lowest
Te Puke	22	15	1973	2 nd lowest
Whakatane Airport	5	6	1975	Lowest
Rotorua Airport	10	8	1964	2 nd lowest
Taupo Airport	18	24	1976	Lowest
Motu	26	16	1991	Lowest
Auckland, Mangere	11	11	1959	Lowest
Auckland Airport	21	22	1963	2 nd equal lowest
Stratford	43	27	1961	Lowest
Takaka	15	9	1971	Lowest
Farewell Spit	5	5	1874	Lowest
Lake Rotoiti	17	12	1934	Lowest
Franz Josef	118	27	1983	2 nd lowest
Stephens Island	4	6	1894	Lowest
Motueka, Riwaka	7	6	1943	3 rd lowest
Nelson Airport	5	6	1941	Equal lowest
Nelson, Appleby	3	4	1932	Lowest
Blenheim Research	7	13	1986	2 nd lowest
Blenheim Airport	6	9	1941	2 nd lowest
June				
Blenheim Research	15	24	1986	Lowest
Timaru Airport	4	10	1957	3 rd lowest
Ranfurly	7	27	1975	2 nd lowest
Clyde	11	35	1983	2 nd lowest
July				
Ranfurly	7	28	1975	3 rd lowest
Raoul Island	48	32	1940	2 nd lowest

Location	Rainfall (mm)	Percentage of normal	Year Records began	Comments
August				
Dargaville	31	27	1943	Lowest
Whangarei Airport	54	39	1937	2 nd lowest
Warkworth	43	27	1972	2 nd lowest
Auckland, Mangere	35	30	1959	Lowest
Auckland Airport	38	35	1962	2 nd lowest
Pukekohe	37	35	1970	Lowest
New Plymouth Airport	52	40	1944	Lowest
Waione	25	21	1992	Lowest
East Taratahi	19	24	1972	Lowest
Ngawi	26	22	1989	2 nd lowest
Whakatu	16	28	1983	Equal lowest
Paraparaumu Airport	23	26	1945	2 nd lowest
Wellington, Kelburn	30	26	1862	Equal 2 nd lowest
Wellington Airport	35	36	1960	Equal lowest
Wallaceville	18	14	1924	Lowest
Stephens Island	20	23	1894	3 rd lowest
Blenheim Research	15	21	1985	Lowest
Blenheim Airport	22	33	1941	3 rd lowest
Hanmer Forest	12	10	1905	Lowest
Darfield	10	11	1920	Equal 3 rd lowest
Christchurch Gardens	11	16	1864	3 rd lowest
Le Bons Bay	11	9	1989	Lowest
Dunedin Airport	10	20	1963	Lowest
Musselburgh	10	15	1918	2 nd lowest
September				
Takaka	56	32	1986	Lowest
Motueka	23	20	1943	Lowest
Appleby	9	11	1932	Lowest
Blenheim Research	19	37	1985	2 nd lowest
October				
Takaka	69	28	1986	Lowest
Franz Josef	218	31	1982	3 rd lowest
Manapouri Airport	38	30	1991	2 nd lowest
November				
Kaitaia Observatory	29	28	1985	Lowest
Kerikeri EWS	33	25	1981	3 rd lowest
Kerikeri Airport	29	23	1978	Equal 2 nd lowest
Taupo Airport	25	33	1976	Lowest
New Plymouth Airport	33	30	1944	Lowest
Lower Retaruke	40	30	1966	Lowest
Paraparaumu Airport	5	6	1945	Lowest
Wallaceville	18	18	1924	2 nd lowest
Stratford	37	22	1960	Lowest
Waiouru MWD	29	35	1950	2 nd lowest
Takaka	38	19	1986	Lowest
Farewell Spit	15	16	1874	Equal 3 rd lowest
Reefton	55	32	1960	2 nd lowest
Stephens Island	4	6	1894	Lowest
Riwaka	20	19	1943	3 rd lowest
Blenheim	13	24	1985	3 rd lowest
Le Bons Bay	19	28	1990	Lowest

FLOODS AND HIGH RAINFALL

There were at least 26 heavy rainfall events during 2005, half of which produced floods. The events that produced the catastrophic floods in Tauranga and Matata during May were by far the most destructive.

- **5 January**

Rainfall totalling 50-100 mm occurred in Kapiti, Horowhenua, Manawatu, and the Hutt Valley, and Golden Bay on the 5th. Rainfall totals for 24 hours exceeded 300 mm in the Tararuas, and 230 mm and 100 mm were reported in Otaki in 12 and 3 hours respectively, with 124 mm and 74 mm reported in the Akatarawa Hills during the same periods. The Waitohu Valley Road Bridge was washed out during the high rainfall/flooding event. The flash floods on the Kapiti coast resulted in metre high (waist deep) water at Otaihanga, and 23 houses near the Waikanae River, which breached its banks, were evacuated. Roads out of Wellington, including SH1 at Paekakariki were closed for a time. Localised high, short period rainfall also affected eastern areas of Southland on the same day.

- **7-8 January**

Localised high rainfall also resulted in flooding and landslips in South and West Otago over January 7-8, leaving one bridge closed, and several damaged. Reports of almost 60 mm in an hour were sighted, and 80 mm over 6 hours. The flooding also damaged roads and pasture, and resulted in stock losses.

- **17 January**

Heavy rainfall on the afternoon of the 17th resulted in flooding in Dunedin, with totals of 9 mm in 5 minutes.

- **7 February**

Thunderstorms occurred in Dunedin on the 7th, between 6 pm and 6.30 pm, with heavy rainfall totalling 17 mm in 15 minutes in the city, and 34 mm in 20 minutes in the hills. Flash flooding resulted with the downpour, water being knee-high in some areas, affecting many houses and shops, damages estimated in the millions of dollars.

- **11-16 February**

High rainfall totalling 70-80 mm occurred in Takaka on the 11th, with significant falls totalling 130-150 mm in Hokitika on the 16th. Heavy rainfall, totalling at least 100 mm, occurred in Temuka over the 13-14th, resulting in surface flooding, and a temporary closure of SH1 south of Timaru.

- **5-10 March**

Rainfall was extremely high in Fiordland from 5 through 10 March, with 306 mm recorded at Milford Sound on the 5th, and 702 mm for the 6-day period.

- **17 March**

Rainfall totalling 50-75 mm occurred in Bay of Plenty and Hawke's Bay on the 17th.

- **24 March**

Rainfall on the 24th of March totalled 137, 96, and 50-60 mm at Lake Rotoiti (Nelson Lakes), Takaka, and Nelson respectively.

- **29-31 March**

Further high rainfall, totalling 60-100 mm occurred throughout much of Taranaki, Wairarapa and Wellington over the 29th-31st, some areas recording more than 100 mm. Six houses were evacuated after flooding occurred in the Riversdale-Castlepoint district. Torrential rainfall totalling 57 mm was recorded at Castlepoint between 5 and 6pm on the 30th, with 115 mm between 5 and 8pm that evening. For the 24-hours to 9am on the 31st, Wellington Airport recorded its highest 1-day rainfall (94 mm) total since 1981.

- **1-2 May**

High rainfall (100 mm reported in 6 hours at Pohokura, and 80 mm in 3 hours at Motunui, Taranaki) resulting in slips and surface flooding closing SH 43, and the closure of a school. High winds, attributed to a tornado, also affected Taranaki, between Motunui and Urenui during the early morning on the 2nd, damaging an orchard, and destroying a farm shed.

- **3-4 May**

Torrential rainfall resulted in serious widespread flooding in Tauranga, especially in Otumoetai, Arataki, and Omanu. Many homes and businesses were flooded, with water a metre deep in areas, and emergency services were stretched to the limit. Rainfall totalling 144 mm was measured at Tauranga Airport in the 24 hours to 8am on the 4th. Heavy rainfall occurred between 3 pm and 11 pm on the 3rd, during which time there was 1-hour with rainfall totalling 67 mm. High rainfall also affected other sites in Bay of Plenty, as well as Hawke's Bay, on the same day, many locations recording 75-100 mm.

- **17-18 May**

A phenomenal, unprecedented high-rainfall flood-producing event affected Bay of Plenty, particularly from Tauranga to Matata. Heavy rainfall occurred between 11 pm on the night of the 17th and 8 pm on the night of the 18th, during which time there were 6-hours with rainfall exceeding 30 mm per hour, and one hour with 58 mm. Tauranga Airport recorded a massive 347 mm of rainfall in 24-hours. This was well above any other daily rainfall total there in records which commenced in 1910, but comparable with those recorded for shorter durations on 17 April 1948, when 95, 146 and 212 mm was recorded in 1, 2 and 6 hours respectively. Rainfall totalling 95 mm in one hour was reported at Awakaponga, inland from Matata. The New Zealand low lying land-station record was 109 mm in an hour recorded at Leigh (north of Auckland) on 30 May 2001. A state of emergency was declared on 18 May in Tauranga and Matata. There were hundreds of calls for emergency services. Police and army personnel assisted evacuations, while fire fighters pumped water from homes. Emergency personnel were also called in from outlying districts. About 450 people were evacuated for Tauranga, Papamoa, and Matata. In Tauranga, several city homes were destroyed by mudslides and floodwaters and rising waters threatened hundreds of others. The airport was closed by flooding. Landslides threatened several homes and over a hundred residents were evacuated. More than 40 houses in Papamoa were evacuated. Many residents described the scene in Tauranga as a "disaster zone". Several of the Tauranga houses had to be demolished. Flooding was extreme in Matata, where a stream became a torrent of water, mud, huge boulders, and debris. Approximately 200 of the towns 500 people were evacuated. Houses were pushed off their foundations, nearly 100 being damaged, many motor vehicles were swept into the lagoon, some buried. Children were trapped in schools. One family became trapped in the roof of their home. Two houses and several caravans were swept out to sea. Railway lines were buckled, and about 20 motorists trapped. Parts of roads and two bridges near Matata on SH 2 were washed away. There was no drinking water supply. It was stated that the town of Matata looked as through a tsunami had gone through it. At least one house was flooded in Edgecumbe, and there was surface flooding after 170mm of rainfall at Pongakawa and 150mm at Awakaponga on the 18th on the Rangitaiki Plains. The cost of the damage from this event has been estimated to be at least \$40-50 million.

- **17 June**

Rainfall totalling 50 to 90 mm occurred in the Bay of Islands, western Nelson, and South Westland.

- **24 June**

Rainfall totalling about 70 mm occurred in Whitianga.

- **28 June**

Rainfall totalling 65-90 mm occurred in South Westland and Fiordland, and western Southland.

- **4-6 July**

High rainfall totalling 130 – 215 mm occurred in inland and eastern parts of Northland, with some flooding, and several schools closed.

- **10 July**

Surface flooding occurred near and about Matata, Bay of Plenty, after heavy rainfall, with truck drivers having to be rescued.

- **17 July**

High rainfall totalling 160 - 170 mm occurred in the high country of southern Coromandel and western Bay of Plenty, with a washout near Pauanui, north of Whangamata.

/10 of 22 pages

- **18 July**

Rainfall totalling 80-90 mm occurred in Golden Bay and western Nelson.

- **19 July**

Isolated, but heavy rainfall (about 100 mm), occurred in the Kakanui Range (north Otago) causing the Kakanui River to reach its highest flood level since January 2002.

- **4-7 September**

High rainfall totalling 338 mm was recorded at Arthurs Pass between 4 and 7 September.

- **2 October**

Rainfall totalling 70-80 mm was recorded in Western Bay of Plenty on the 2nd.

- **20-22 October**

A major rainfall event produced rainfall totals of 55 to 85 mm throughout much of Northland, Auckland, Coromandel, Bay of Plenty on the 20th, spreading to Gisborne and Hawke's Bay the next day; Gisborne Airport recording 148 mm for the 24 hours to 9 am on the 22nd, and Motu 134 mm, with 93 mm at Napier Airport. However, more than 300 mm of rainfall was reported in the inland hill country in areas north of Gisborne. There were extensive crop losses (affecting about 3000 ha of horticultural land), and damage to roads on the Tologa and Poverty Bay plains. About 50 homes were evacuated, and the water supply cut off. The Mangatuna settlement appeared to be the worst affected area. The cost of the damage and losses is estimated to be in the millions.

- **20-22 November**

Rainfall totalling 73 mm was recorded in Whitianga on the 25th. Several days of high rainfall, especially in the hill country, resulted in surface flooding in the Gisborne region on the 27th and 28th. Motu recorded 170 mm over two days. The Te Karaka and Manutuke areas were the worst affected. Several roads were closed, including SH2 between Gisborne and Opotiki. A number of schools were closed, and many residents were on standby in case of evacuation, due to high river levels. The rainfall also damaged ripening cherry crops.

- **13-17 December**

Rainfall totalled over 100 mm at Cape Reinga on the 13th, and over 50 mm in parts of Northland, Thames, Bay of Plenty, and Taranaki from the 15-17th. Torrential rainfall occurred in Wanganui during the afternoon on the 13th totalling 20 mm in 20 minutes.

Some locations experienced unusually high monthly rainfall at various times during the year. These were:

Location	Rainfall (mm)	Percentage of normal for the month	Year Records began	Comments
February				
Timaru Airport	129	285	1957	2 nd highest
Tiwai Point	142	186	1971	3 rd highest
March				
Castlepoint	278	307	1902	2 nd highest
East Taratahi	208	286	1973	Highest
Lake Rotoiti	245	224	1934	2 nd highest
April				
Chatham Islands	154	206	1951	2 nd highest
May				
Whitianga Airport	306	263	1988	2 nd highest
Tauranga Airport	634	714	1898	Highest for any month
Te Puke	405	356	1973	Highest
Whakatane Airport	341	433	1975	Highest
Rotorua Airport	284	260	1964	3 rd highest
Hamilton Airport	243	230	1935	Highest
October				
Whangaparaoa	162	217	1987	Highest
Auckland, Henderson	219	201	1986	Highest
Auckland, Owairaka	209	229	1949	Highest
Whitianga Airport	246	193	1990	Highest
Te Puke	313	228	1973	2 nd equal highest
Whakatane Airport	216	215	1975	3 rd highest
Taupo Airport	174	192	1976	3 rd highest

Auckland Airport	180	218	1962	2 nd highest
Hamilton Airport	202	204	1935	2 nd highest
Gisborne Airport	225	356	1905	2 nd highest
Napier Airport	194	328	1950	2 nd highest
Whakatu	155	318	1983	2 nd highest
Mahia	202	244	1991	Highest
December				
Cape Reinga	177	306	1919	Highest
Tauranga Airport	189	218	1898	Well above average
Lower Retaruke	228	177	1966	3 rd highest
Wanganui	196	279	1890	Highest
Ranfurly	116	213	1975	3 rd highest
Lumsden	190	208	1986	2 nd highest

SNOWFALL

Snowfall was much less frequent than normal during mid and late winter, with ski areas having a very short season. The September occurrence to sea level in Canterbury was unusual for the month.

- **23-24 April**

Snowfall settled on the North Island's Desert Road, the Rimutaka Hill Road, and as low as 400 metres in the South Island.

- **2-3 June**

Several Otago and Southland roads were closed by snow, with sleet and hail elsewhere in the region. As much as 15 cm of snowfall lay in parts of eastern Southland, with lesser amounts in the Catlins and along the South Otago coast, including the motorway north of Dunedin. Several central North Island roads were also closed due to snowfall, about 20 cars and two trucks being trapped in the snow.

- **25-26 June**

Snow fall on the North Island Desert Road, and on the Orongorongo Ranges east of Wellington

- **19 September**

A depression which had intensified over the Tasman Sea tracked over the lower North Island (with central pressures below 970 hPa) on the 18th. An unseasonably cold southerly outbreak followed, with snowfall to sea level in Canterbury on the 19th. The snowfall resulted in the closure of Christchurch Airport, along with schools and universities, with snow depths of 5-10 cm reported in the region. Power cuts also occurred. The maximum air temperature at the airport was only 4.8 °C on 19 September, the lowest there in September in records that commenced in 1954. The southerlies resulted in significant fresh snowfall in the central North Island mountains, and closed the Desert Road. In Canterbury, hundreds of newborn lambs died in the cold. Snowfall depths of 10 cm were reported in the Queenstown district. With 25 cm of new snow, Coronet Peak ski field was able to reopen after having closed early on 12 September. Further south, snow lay briefly in Alexandra on the 19th.

- **8 October**

Snowfall occurred on the Desert Road, with 15 cm at Arthurs Pass, Lewis Pass, and Porters Pass.

SEVERE OR DAMAGING HAIL STORMS

- **23-24 April**

Thunderstorms affected southern and eastern regions of New Zealand, accompanied by large hail stones, some 15-20 mm in diameter, following the passage active the frontal bands during the night of 23/24 and evening of 24 April. In Christchurch, some windows were smashed.

/12 of 22 pages

- **5 October**

A hailstorm affected parts of Hawke's Bay (Mangateretere and Whakatu) at about 2.30 pm on the 5th, damaging summer fruit crops. Most of the hailstones were described as pea-sized, which lasted for 10 minutes. Hail was still lying on the ground at 5 pm.

- **17 October**

Hailstorms affected parts of Gisborne (Te Karaka) during the afternoon, some hail stones estimated to be the size of small golf balls and the ground covered to a depth of 25 mm, and also Hawke's Bay with crops in some orchards damaged.

- **30 October**

Pea sized hail occurred in Wairarapa. These were associated with thunderstorms which produced torrential rainfall, totalling 22 mm in 10 minutes and 32 mm in an hour (4-5 pm) in Masterton.

- **19 November**

Hailstones 10 mm in diameter affected Kaiwaka near Welsford, between 10am and 10.45am. The hail was 10-15cm thick on lawns, and up to 45 cm depth on some roads, ice lay on the road until 5pm. Golf ball size Hailstones (40 mm in diameter) occurred at Waipu Cove, Northland, shredding fruit, tomatoes, onions, and lettuce for 30 minutes, followed by surface flooding.

- **19 November**

Hailstones 10 mm in diameter affected Kaiwaka near Wellsford, between 10am and 10.45 am. The hail was 10-15 cm thick on lawns, and up to 45 cm depth on some roads, ice lay on the road until 5pm. Golf ball size Hailstones (40 mm in diameter) occurred at Waipu Cove, Northland, shredding fruit, tomatoes, onions, and lettuce for 30 minutes, followed by surface flooding.

- **5 December**

Marble-sized hail stones occurred during thunderstorms in Waimatuku, Southland on the 5th.

- **15 December**

Intense hail occurred at Heddon, Southland on the 15th destroying crops.

ELECTRICAL STORMS

- **23-24 April**

Thunderstorms affected southern and eastern regions, accompanied by extensive lightning.

- **17 July**

Severe electrical storms from Northland to Thames, some places recording 200 lightning strikes in an hour.

- **6 December**

Frequent lightning strikes occurred in Taranaki, leaving over 3000 people temporarily without power.

TORNADOES, GALES, HIGH WINDS, AND ROUGH SEAS

- **8 and 10 March**

Tornado like winds struck Blaketown (Westland) about 6.15 pm on the 8th, damaging three properties. A severe, damaging, tornado tracked through parts of Greymouth just after 1 pm on the 10th. Many buildings, houses, and dozens of motor vehicles were seriously damaged (some overturned) by the high winds and flying debris (roofs lifted and window panes smashed), with damages estimated to be at least \$10 million. A power pole even snapped in half. About 30 people were left homeless, and three injured. There were no fatalities. The tornado left a 400-500 m wide and 4 km long track of damage from the river mouth, southeast through the township, toward the hills. Estimates of maximum wind speeds, based on the international Fujita tornado scale, range from 180 km/h to 250 km/h. The tornado was preceded by lightning.

/13 of 22 pages

- **25 March**

More tornado-like winds struck parts of Bay of Plenty, damaging trees and properties near Kawerau on the 25th.

- **17 March**

Huge waves, with 6 m swells, generated by an offshore low pressure system northeast of Gisborne and strong easterlies, resulted in flooding and damage in the Hawke's Bay coastal settlement of Haumoana on the 17th, six houses being evacuated, 60 being affected.

- **1 April**

A series of waterspouts were sighted off the Whangamata coast on the 1st.

- **3 April**

A high wind gust of 174 km/h was recorded from the northwest, measured at Southwest Cape (Stewart Island) on the 3rd.

- **4 April**

A small tornado was sighted in Greymouth on the 4th.

- **2 May**

High winds, attributed to a tornado, affected Taranaki, between Motunui and Urenui during the early morning on the 2nd, damaging an orchard, and destroying a farm shed.

- **1 June**

Damaging winds, attributed to a tornado, toppled trees – cutting electricity to over 1000 homes near Lake Rotoiti, Rotorua.

- **11-12 June**

A couple (one person was injured) and their yacht were caught in a severe storm in high winds and 7 to 8 metre swells about 750 km north of New Zealand. They were safely rescued and brought back to New Zealand.

- **25 June**

At least three tornados hit southeastern parts of Auckland, resulting in fallen trees (trapping several people), and surface flooding.

- **12/13 July**

High winds damaged power lines on the Coromandel Peninsula overnight, leaving about 9000 residents without electricity, including the townships of Whitianga and Coromandel.

- **5 September**

A tornado struck Hokitika at 12.30 am , lifting a house roof, smashing windows, overturning a furniture truck, and leaving a trail of damage.

- **19 September**

Cape Reinga recorded a wind gust of 156 km/h occurred from the southwest.

- **8 October**

During gale force westerlies and rough seas on the 8th, a 3000-tonne container ship crashed into Auckland's old Mangere Bridge, and about 20 boats were blown off their moorings. Trees were felled, power lines broken, and roofs lifted in the city, with power cuts for about 17,500 residents. Gusts to 150 km/h were noted at Tiri Tiri Matangi lighthouse, and 100 km/h at Auckland Airport. The same weather system resulted in fallen trees in Northland.

- **11 October**

A tornado affected parts of Auckland city just after 1am, including Western Springs, Kingsland, and Morningside, resulting in damaged roofs.

/14 of 22 pages

- **15 October**

High winds, attributed to a tornado, damaged an Okorore barn, trees, fences and power lines near Matamata.

- **5 November**

Castlepoint recorded a wind gust of 150 km/h from the northwest.

- **5 and 6 December**

Four tornadoes were sighted during thunderstorms at Waimatuku, Southland on the 5th, some damage occurring to property. Sudden and brief tornado-like winds occurred in Rotorua on the 6th damaging property.

- **15 December**

Tornado-like winds occurred at Heddon, Southland, felling trees.

SEVEN WARMER MONTHS, TWO COOLER, THREE NEAR AVERAGE

The 2005 national average temperature was 13.1 °C, 0.5 °C above the 1971 – 2000 normal, and the fourth warmest year nationally since reliable records commenced in the 1860s. Only 1971, 1998 and 1999 have been warmer with temperatures of 13.2, 13.3 and 13.3 °C respectively. For New Zealand as a whole, there were seven warmer than normal months (February, March, May, July through September, and December), two cooler than normal months (January and April), and three months with mean temperatures close to the climatological average (June, October and November). February with a mean temperature of 18.6 °C (1.3 °C above normal) was the 8th warmest on record, July with 9.1 °C (1.2 °C above normal) was the 3rd warmest on record, August with 9.8 °C (1.1 °C above normal) was the 4th warmest on record, and December with 17.5 °C (1.9 °C above normal) was the 3rd warmest on record.

Some highlights were:

HIGH TEMPERATURES

- **Mid-summer heat wave**

The highest January 2005 temperatures were 36.2 °C recorded at Darfield on the 15th (the 3rd highest January temperature in records back to 1939), and 34.4 °C recorded in Murchison on the 27th (their 2nd highest January temperature in records back to 1970). Darfield maximum temperatures were 30.0 °C or higher on 4 consecutive days from the 13th-16th. Murchison maximum temperatures were 30.0 °C or higher on 4 consecutive days from the 24th-27th. January 31 was New Plymouth's hottest day for 30 years. The airport recorded 29.2 °C, the highest there since January 1975 when 30.3 °C was recorded.

- **8th warmest February on record**

February 2005 was one of the warmest on record. The first 10-days of February were very hot, with maximum temperatures of 30 °C or more in many locations throughout New Zealand, and temperatures of 35 °C or more in sheltered inland areas of the South Island. For the month, the national average temperature of 18.6 °C was 1.3 °C above normal, and 8th highest since reliable measurements dating back to the mid 1860s. The highest temperatures during the February 2005 heat wave was 38.7 °C recorded at Alexandra on the 5th (the highest temperature there for any month, in records back to 1929). This is only one a few occasions when temperatures in New Zealand have exceeded 100 °F (37.8 °C). Mean temperatures were at about 1.5 °C above average in many regions, but more than 2.0 °C above average throughout parts of inland Wairarapa, Manawatu, Horowhenua, Kapiti, Canterbury, the Southern Lakes, and in Central Otago. Temperatures were 0.5 °C above average in Northland.

- **3rd warmest July on record**

July, for many, was very much warmer, and windier than normal. The national average temperature of 9.1 °C was 1.2 °C above normal, and the third highest for July in reliable records dating back to the mid 1860s. Only July 1998 (9.6 °C) and July 2000 (9.3 °C) were warmer. There were only about half the average number of days with screen (air) frost in July in many North Island and most low lying/coastal South Island locations. Frostiness was also less frequent in inland South Island areas. Mean temperatures were about 1.0 °C above average throughout much of the North Island, and 1.5 °C above average throughout much of the South Island. The largest anomalies were in parts of Buller, Marlborough, and Central Otago, with mean temperatures about 2.0 °C above average. Overnight minimum temperatures were generally about 1.5 °C above average. They were almost 3.0 °C above average in Paeroa and Nelson.

- **4th warmest August on record**

The month was much warmer than normal with the national average temperature of 9.8 °C being 1.1 °C above normal: the fourth highest for August in reliable records dating back to the mid 1860s. Only August 1893 and

1967 (both 9.9 °C), and August 1987 (10.0 °C) were warmer. The highest temperatures during August 2005 were 25.1 °C recorded at Hanmer Forest on the 30th, and 25.4 °C recorded in Amberley on the 31st. These both exceeded the previous all-time New Zealand maximum temperature record for August. Maximum temperatures reached at least 20.0 °C somewhere in Canterbury every day from 19 through 23 August.

• **Unusually warm December**

Temperatures were remarkably high throughout the nation. The national average temperature was 17.5 °C, 1.9 °C above average. This was the warmest December in 71 years (18.5 °C in 1934), and third warmest since reliable records commenced in the mid 1860s. Mean temperatures were at least 1.5 °C above average throughout much of New Zealand. However, they were 3.0 °C or more above average in parts of Otago, and Southland.

Extremes of daily maximum temperature in 2005 were recorded at:

Location	Maximum temperature (°C)	Date of occurrence	Records began	Comments
January				
Darfield	36.2	15 Jan	1939	3 rd highest
Murchison	34.4	27 Jan	1970	2 nd highest
New Plymouth Airport	29.2	31 Jan		Highest since 1975
February				
Alexandra	38.7	5 Feb	1929	Highest for any month
Whakatane Airport	31.3	1 Feb	1975	Equal highest for Feb.
New Plymouth Airport	29.5	1 Feb	1944	Highest for Feb.
East Taratahi	33.1	10 Feb	1973	2 nd highest for Feb.
Palmerston N. Airport	31.3	5 Feb	1962	2 nd highest for Feb.
Levin	31.1	5 Feb	1896	Highest for any month
Wellington Airport	28.1	6 Feb	1962	3 rd highest for Feb.
Reefton	33.5	1 Feb	1961	Highest for Feb.
Murchison	36.8	4 Feb	1970	Highest for any month
Hanmer Forest	35.1	10 Feb	1906	3 rd highest for Feb.
Culverden	35	6, 9 & 10 Feb	1984	Highest for any month
Hororata, Illana	35	9 Feb	1998	Equal highest for any month
Wanaka Airport	34.5	4 Feb	1993	Highest for any month
Queenstown	33.2	4 Feb	1872	2 nd highest for Feb.
Queenstown Airport	32.2	4 Feb	1969	Highest for any month
Lauder	35.0	5 Feb	1981	Highest for any month
Clyde	35.7	5 Feb	1984	Highest for any month
Ranfurly	33.4	5 Feb	1975	Highest for any month

/16 of 22 pages

Extremes of maximum temperature in 2005 were recorded at:

Location	Maximum temperature (°C)	Date of occurrence	Records began	Comments
August				
Amberley	25.4	31 Aug	1973	Highest *New Zealand August record
Hanmer Forest	25.1	30 Aug	1906	Highest *Exceeded previous New Zealand August record
Culverden	25.0*	31 Aug	1983	Highest

Waipara	23.8	31 Aug	1973	Highest
Ranfurly	23.0	31 Aug	1975	Highest
Lauder	22.2	31 Aug	1987	Highest
Alexandra	22.0	29 & 30 Aug	1993	Highest
East Taratahi	21.9	31 Aug	1972	Highest
Ngawi/Cape Palliser	21.8	31 Aug	1972	Highest
Waione	21.6	30 Aug	1993	Highest
Tara Hills	21.6	31 Aug	1950	Highest
Clyde	21.6	31 Aug	1983	Highest
Dunedin Airport	21.1	21 Aug	1963	3 rd highest
Blenheim Airport	21.0	30 Aug	1941	Highest
Motu	20.9	31 Aug	1991	Highest
Mt Cook Village	20.9	31 Aug	1931	Highest
September				
Auckland, Henderson	23.3	12 Sep	1986	Highest
November				
Takaka	27.7	4 Nov.	1986	2 nd highest
Culverden	30	9 Nov.	1983	Highest
Queenstown	29.3	9 Nov.	1871	Highest
Alexandra	30.0	9 Nov.	1992	Highest

Unusually high mean monthly temperatures were recorded at:

Location	Mean temperature	Departure (°C)	Records began	Comments
February				
Pukekohe	20.3	+1.3	1971	2 nd highest
Tauranga Airport	20.9	+1.4	1913	3 rd equal highest
Whakatane Airport	20.6	+1.4	1975	2 nd highest
New Plymouth Airport	19.5	+1.5	1945	2 nd equal highest
East Taratahi	19.6	+2.1	1973	3 rd highest
Paraparaumu Airport	19.4	+2.1	1953	2 nd equal highest
Palmerston North Airport	20.2	+2.3	1962	3 rd highest
Palmerston North	20.4	+2.2	1928	3 rd highest
Levin	19.7	+1.9	1896	2 nd equal highest
Kelburn	18.7	+1.6	1928	3 rd equal highest
Wellington Airport	19.6	+1.7	1962	3 rd highest
Wallaceville	18.8	+1.8	1940	2 nd equal highest
Ohakune	17.4	+2.6	1994	Highest
Takaka	18.7	+1.4	1986	2 nd highest
Farewell Spit	19.5	+1.6	1971	Equal highest
Franz Josef	16.8	+1.3	1982	Equal highest
Nelson Airport	19.4	+1.8	1944	2 nd highest
Blenheim Airport	19.4	+1.7	1986	3 rd highest
Hanmer Forest	18.0	+2.3	1906	2 nd highest
Kaikoura	18.1	+1.6	1964	3 rd highest
Winchmore	18.2	+2.0	1950	2 nd highest
Christchurch Airport	18.5	+1.7	1954	2 nd highest
Timaru Airport	17.3	+1.8	1962	2 nd highest
Dunedin Airport	16.8	+2.0	1963	3 rd highest
Queenstown Airport	17.4	+2.0	1969	3 rd equal highest
Clyde	18.6	+1.9	1984	3 rd equal highest
Chatham Islands	17.3	+2.1	1957	2 nd highest

/17 of 22 pages

Unusually high mean monthly temperatures were recorded at:

Location	Mean temperature	Departure (°C)	Records began	Comments
May				
Kaitaia	15.9	+1.4	1985	Equal highest
Kerikeri EWS	15.4	+1.4	1982	Equal highest
Kaikohe	15.1	+1.6	1973	Highest
Dargaville	15.5	+1.7	1943	Highest
Whangarei Airport	15.7	+1.5	1968	Highest

Te Puke	13.6	+1.6	1973	Highest
Whakatane Airport	13.1	+1.5	1975	2 nd equal highest
Taupo Airport	11.2	+1.8	1976	Highest
Motu	10.5	+1.8	1991	Equal highest
Mangere, Auckland	15.1	+1.3	1959	2 nd equal highest
Auckland Airport	15.2	+1.5	1962	Highest
Pukekohe	14.4	+1.4	1971	2 nd highest
Hamilton Airport	12.9	+1.6	1971	2 nd equal highest
Mt Ruapehu, Chateau	7.5	+2.0	1930	3 rd highest
East Taratahi	11.5	+1.5	1973	2 nd highest
Paraparaumu Airport	12.8	+1.4	1953	3rd highest
Palmerston North Airport	12.5	+1.6	1962	2nd equal highest
Palmerston North EWS	12.9	+1.5	1928	3rd equal highest
Levin	12.9	+1.5	1896	3rd equal highest
Wallaceville	12.4	+1.9	1940	2nd equal highest
Ohakune	9.8	+1.8	1994	Highest
Wanganui, Spriggens Pk	13.5	+1.3	1937	3rd equal highest
July				
Dargaville	12.6	+1.4	1943	2 nd highest
Whangarei Airport	12.6	+1.1	1968	3 rd highest
Pukekohe	11.5	+1.4	1970	2 nd highest
Wanganui, Spriggens Pk	11.0	+1.6	1937	2 nd highest
Farewell Spit	11.1	+1.6	1937	Highest
Nelson Airport	8.9	+1.5	1943	3 rd highest
Blenheim Airport	8.8	+1.7	1941	2 nd highest
Hanmer Forest	6.4	+2.2	1906	2 nd highest
Winchmore	7.1	+1.6	1950	2 nd equal highest
Lincoln	7.7	+1.5	1987	3 rd highest
Tara Hills	4.2	+2.3	1950	Highest
Wanaka Airport	5.0	+1.5	1992	Highest
Dunedin Airport	6.3	+1.2	1963	Highest
Queenstown	5.6	+1.5	1872	2 nd highest
Lauder	3.7	+2.0	1986	Highest
Clyde	4.9	+2.1	1983	2 nd highest
Invercargill Airport	6.6	+1.4	1948	Highest

Unusually high mean monthly temperatures were recorded at:

Location	Mean temperature	Departure (°C)	Records began	Comments
August				
Motu	8.1	+2.5	1992	Highest
Mt. Ruapehu, The Chateau	4.8	+1.6	1932	2 nd highest
Wellington, Kelburn	10.7	+1.5	1862	2 nd highest
Puysegur Point	10.0	+1.7	1980	Highest
Blenheim Research	10.2	+1.6	1985	Highest
Hanmer Forest	7.7	+2.1	1906	2 nd highest
Kaikoura	10.2	+1.7	1964	2 nd equal highest
Winchmore	8.5	+1.7	1950	3 rd highest
Lincoln	9.3	+2.0	1881	2 nd highest
Dunedin, Musselburgh	8.8	+1.2	1947	2 nd highest
Manapouri Airport	6.7	+1.7	1992	Highest
Queenstown	7.3	+1.7	1872	2 nd highest
Lauder	6.5	+1.8	1981	2 nd highest
Gore	7.4	+1.4	1986	Highest
Invercargill Airport	7.9	+1.5	1948	Highest
Tiwai Point	8.7	+1.5	1970	Highest
Chatham Islands	9.5	+1.0	1957	Equal highest
September				
Motu	9.7	+1.6	1991	2 nd highest
Wellington, Kelburn	11.9	+1.3	1928	3 rd highest
Stratford	10.7	+1.3	1960	3 rd equal highest
Wanganui, Spriggens Park	13.0	+1.3	1937	3 rd highest
Farewell Spit	12.8	+1.3	1971	Equal highest
Motueka, Riwaka	11.3	+1.1	1956	2 nd highest

Wanaka Airport	9.8	+1.5	1992	Highest
Invercargill Airport	9.6	+1.3	1948	3 rd equal highest
December				
Whangarei Airport	19.8	+1.6	1967	Highest
Auckland, Henderson	19.4	+1.3	1985	Equal highest
Tauranga Airport	19.2	+1.7	1913	Highest
Whakatane Airport	19.1	+2.1	1974	Highest
Motu	16.2	+2.0	1990	Highest
Auckland Airport	19.6	+1.4	1962	Highest
Pukekohe	18.5	+1.5	1970	3 rd highest
New Plymouth Airport	17.7	+1.5	1944	Equal highest
East Taratahi	18.1	+2.9	1972	2 nd highest
Mahia	18.4	+1.3	1990	Highest
Paraparaumu Airport	17.6	+1.7	1953	Equal highest
Palmerston North EWS	18.3	+2.0	1928	2 nd highest
Levin	18.0	+2.1	1895	Equal highest
Wellington, Kelburn	17.4	+2.0	1928	2 nd highest
Wellington Airport	18.1	+1.7	1962	Equal highest
Wallaceville	17.7	+2.2	1939	Highest
Wanganui, Spriggens Park	18.8	+2.0	1937	Equal highest
Farewell Spit	18.4	+2.5	1972	Highest
Westport Airport	16.9	+1.9	1937	2 nd highest
Lake Rotoiti	15.2	+2.3	1965	Equal 2 nd highest
Hokitika Airport	16.7	+2.4	1963	Highest
Franz Josef	16.1	+2.6	1982	Highest
Milford Sound	16.3	+2.8	1934	2 nd highest
Puysegur Point	15.8	+3.2	1978	Highest
Stephens Island	16.8	+2.3	1973	Highest
Motueka, Riwaka	18.6	+2.5	1956	Highest
Nelson Airport	18.8	+2.6	1943	Highest
Blenheim Research	18.4	+1.7	1985	2 nd highest
Blenheim Airport	18.6	+2.3	1941	Equal highest
Arthurs Pass	13.7	+2.5	1978	Highest
Winchmore	16.9	+2.1	1949	2 nd highest
Timaru Airport	16.2	+1.7	1962	3 rd highest
Tara Hills	16.9	+2.5	1949	Equal highest
Wanaka Airport	18.3	+2.5	1992	Highest
Dunedin Airport	16.7	+2.9	1962	Highest
Dunedin, Musselburgh	15.5	+1.6	1947	2 nd highest
Manapouri Airport	15.8	+2.9	1991	Highest
Queenstown	17.8	+2.7	1871	3 rd highest
Lauder	17.3	+2.9	1981	Highest
Clyde	18.6	+2.8	1983	Highest
Ettrick	17.8	+2.3	1986	Highest
Gore	16.1	+2.6	1987	Highest
Invercargill Airport	16.4	+3.4	1948	Highest
Tiwai Point	16.3	+2.9	1970	Highest
Campbell Island	10.9	+2.1	1941	Highest

/19 of 22 pages

LOW TEMPERATURES AND SEVERE FROST

There were only a few periods during the year with usually low temperatures and/or severe frosts. These were:

- **9 and 18 May**

Widespread severe ground frost occurred in Nelson, Marlborough and Canterbury on the 9th, and in Otago and Southland on the 18th.

- **16 June – lowest annual minima**

The lowest temperature for the year was -9.5 °C, recorded at Ophir (Central Otago) on 17 July.

- **Coldest June in a decade**

The national average temperature for June was 8.3 °C. This was 0.2 °C below normal, and the lowest for June in a decade (7.8 °C in 1996). Air temperatures fell to -6.1 °C at Christchurch Airport on the 25th June, the lowest June temperature there in 30 years.

- **Severe September frosts**

Cold southerlies were followed by severe ground frosts (grass minimum temperature -6.0 °C or lower) in the central North Island, Hawke’s Bay, Manawatu, Kapiti, Wellington, Nelson, inland areas of Buller and Marlborough, Canterbury, Otago and Southland over 20-21 September. Further severe ground frost was measured in Otago on 24 September. Frost prevention measures, including the use of helicopters, were taken to avoid potential plant damage, especially in Marlborough and Hawke’s Bay.

Extremes of minimum temperature in 2005 were recorded at:

Location	Minimum temperature (°C)	Date of occurrence	Records began	Comments
January				
Arthurs Pass	-1.0	18 Jan	1979	Lowest
February				
Etrrick	1.8	18 Feb	1971	Lowest
April				
Motu	-5.8	2 Apr	1991	Lowest
June				
Whakatu, Hastings	-4.9	28 Jun	1983	Lowest for June
Appleby, Nelson	-5.5	27 Jun	1932	Lowest for June
Culverden	-8.2	25 Jun	1983	Lowest for June
Christchurch Airport	-6.1	25 Jun	1954	2 nd lowest (-7.2 °C in 1975)

Unusually low mean monthly temperatures were recorded at:

Location	Mean temperature	Departure (°C)	Records began	Comments
January				
Warkworth	17.2	-1.5	1973	2 nd equal lowest
April				
Castlepoint	12.9	-2.1	1972	3 rd lowest
East Taratahi	11.7	-1.7	1973	Well below average

/20 of 22 pages

FOG

- **2-3 February**

Persistent fog resulted in the closure of Wellington airport and disruption of about 250 flights affecting 1000s of travellers from 2-3 February.

- **17-18 and 20-22 March**

Persistent fog and low cloud occurred at Wellington Airport over the 17-18th and 20-22nd of March resulting in airport closures and the disruption of more than 500 flights affecting tens of thousands of travellers. Many flights had to be diverted to Palmerston North.

- **12 April**

Wellington Airport was closed briefly, due to fog, from late afternoon through evening on the 12th.

- **19-20 May**

Wellington Airport was closed for several hours by fog and low cloud on the 19th and 20th. There were 48 hours with fog there in 2005, the highest for any year in 45-years of measurement.

- **7-8 July**

Dunedin Airport was closed with fog on both days.

- **2 September**

Flights were cancelled for several hours due to fog in Auckland on the 2nd.

SUNSHINE EXTREMES

Some locations experienced extremes of sunshine hours at various times during the year. February was extremely cloudy compared with average in the southwest of the North Island.

Monthly sunshine extremes for 2005 were:

Location	Sunshine (hours)	Percentage of normal	Year Records began	Comments
March				
Kaitaia Observatory	236	142	1986	3 rd highest
Dargaville	231	135	1944	2 nd highest
Auckland, Mangere	232	126	1963	3 rd highest
Martinborough	156	70	1987	2 nd lowest
April				
Kaitaia Observatory	198	124	1986	Highest
Dargaville	184	134	1944	Highest
Auckland, Mangere	223	141	1963	Highest
Nelson Airport	246	131	1949	Highest
Lake Tekapo	226	142	1928	2 nd highest
Dunedin, Musselburgh	179	148	1948	Highest
May				
Lake Tekapo	185	141	1928	2 nd highest
June				
Auckland, Mangere	141	126	1963	3 rd highest
Takaka	183	134	1986	Highest
Dunedin, Musselburgh	141	162	1948	Highest
July				
New Plymouth Airport	96	71	1973	2 nd lowest
Motueka, Riwaka	102	69	1965	Lowest
August				
Kaitaia	195	127	1985	3 rd highest
Dargaville	180	134	1943	2 nd highest
Auckland	204	144	1910	Highest
Tauranga Airport	216	128	1933	Highest
Hamilton, Ruakura	195	141	1936	Highest
Taumarunui	158	148	1947	Highest
New Plymouth	229	149	1915	Highest
Gisborne Airport	209	135	1906	Highest
Palmerston North	199	171	1931	Highest
Paraparaumu Aiprort	188	132	1953	3 rd highest
Wellington, Kelburn	194	143	1928	2 nd highest
Stratford	193	147	1963	Highest
Blenheim	221	124	1930	2 nd highest
Lake Tekapo	197	131	1928	2 nd equal highest
Dunedin, Musselburgh	156	137	1948	3 rd highest
September				
Palmerston North	194	162	1930	3 rd highest
Christchurch Airport	108	65	1949	2 nd lowest

October				
Arapito	226	163	1979	Highest
Hokitika Airport	243	155	1912	2 nd highest
November				
Kaitaia Observatory	257	134	1985	Highest
Hokitika	239	131	1964	3 rd highest
Nelson Airport	277	123	1948	4 th highest
Invercargill Airport	215	122	1932	3 rd highest
December				
Taumarunui	126	68	1947	2 nd lowest

For further information, please contact:

**Dr Jim Salinger, NIWA National Climate Centre - Auckland, Tel (09) 375 2053 (Business)
or (Mobile) 027 521 9468; Stuart Burgess – Climatologist, NIWA National Climate Centre,
Wellington Tel. (04) 386 0569 ©**

**Copyright NIWA 2006. All rights reserved.
ENDS**

/22 of 22 pages