

**MONDAY 10 JANUARY**

**NEW ZEALAND NATIONAL CLIMATE SUMMARY - *THE YEAR 2004***

***2004: VERY STORMY AT TIMES***

***DEVASTATING FLOODS AND EXTREMELY HIGH RAINFALL IN SEVERAL NORTH ISLAND REGIONS;  
HIGH WINDS AND LATE WINTER BLIZZARDS;  
VERY WET IN SOME AREAS AND COOL***

The New Zealand climate record of 2004 reflected a nation prone to extreme climatic events. Forest fires, flooding assessed as the worst in living memory, tornadoes, blizzards, hailstorms and persistent storms with gale force winds characterised a year of dramatic climate extremes. Principal Scientist Dr Jim Salinger, of the NIWA National Climate Centre, says the year produced new records for rainfall, temperatures and sunshine in most months and was dominated by strong stormy westerly and south westerly winds more frequent than normal.

“There were rogue qualities in the overall climate pattern. These included the anticyclones that dominated in January and then gave way to stormy westerlies and south westerlies in February which produced the most extreme rainfall and flooding experienced in Manawatu and Taranaki since the 1920s. Overall the year was one of the wettest on record in parts of the Bay of Plenty, some eastern North Island sites, Manawatu, Kapiti, Upper Hutt and Wairarapa. Few districts escaped the storms and heavy rainfall that battered most of the country at different times.”

“Anticyclones predominated in April and July, with northerlies or northwesterlies in May and June. Weak El Niño conditions appeared in the Equatorial Pacific during August, and strong southwesterlies and deep depressions in the vicinity of the Chatham Islands influenced the climatic patterns through to December. The final month produced a finale with the strongest airflows from the south and south west on record”

The year began with very high temperatures accompanied by high winds, producing life threatening forest fires in early January in Canterbury. These gave way to record rainfall in Taranaki/Wanganui making flooding the dominant climate hazard by the end of February. June was very warm and July brought another bout of flooding in the Bay of Plenty, whilst the south stayed extremely dry. August received very persistent cold southerlies producing blizzards and high winds. Persistent strong cold stormy south westerlies dominated the remainder of the year, with December being unusually cold.

“For the year there were at least 28 heavy rainfall events of which 12 produced floods, mainly in the North Island. The February storms were disastrous, bringing widespread damage to the Wanganui-Manawatu region assessed at over \$300 million, and the July floods in eastern Bay of Plenty were reported to be the worst in the district in living memory. High country regions were affected by many snowfall events from autumn through spring, one as early as March, with several resulting in transport cut and lambs lost”, said Dr Salinger. Of the 19 high wind events, the 15 February southerly storm and the damaging southerly winds of 17-18 August, along with a tragically destructive tornado a few days earlier, were most severe. There were also four damaging hailstorms.

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

- The year’s national average temperature was 12.3°C (0.3°C below normal), the lowest since 1993.

- The highest annual mean temperature recorded for the year was 15.3°C recorded at Whangarei.
- The highest recorded extreme air temperature for the year was 38.4°C recorded at Darfield on New Year's Day, equal to the highest January temperature on record for the South Island.
- A late-autumn heat wave occurred in Hawke's Bay on 2 May, with a record 27.3°C at Napier, a new May all-time record for the North Island.
- June was the 5<sup>th</sup> warmest since measurements commenced in the 1850s.
- The lowest air temperature for the year was –12.0°C, recorded at Fairlie on 16 August, the 3<sup>rd</sup> lowest August air temperature since records commenced in 1925.
- December was the 5<sup>th</sup> coldest on record.
- The driest rainfall recording locations were Middlemarch in eastern Otago with 441 mm of rain for the year, followed by Alexandra with 492 mm.
- Christchurch was the driest of the four main centres with 643mm and Wellington the wettest with 1447 mm. Auckland received 1331 mm and Dunedin 765 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 2004 annual total of 10960 mm.
- Christchurch was the sunniest of the four main centres with 2096 sunshine hours, followed by Wellington (2073 hours) and Auckland (2066 hours). Dunedin recorded 1746 hours. Nelson was the sunniest centre in 2004, recording 2457 hours, followed by Blenheim with 2393 hours, and then Tauranga with 2360 hours.
- The highest recorded wind gust for the year was 183 km/h at Baring Head on 18 August, with hurricane force southerlies and mean speeds as high as 140 km/h.

## **PREVAILING CLIMATE PATTERNS – WEAK EL NINO LATER IN THE YEAR**

Overall, more depressions ('lows') over and east of the South Island prevailed, with stronger stormy westerly and south westerly conditions over the country. Anticyclones ('highs') were prevalent in January, leading to warm conditions, which gave way to very stormy westerly and south westerly and southwesterly conditions producing the most extreme rainfall and flooding experienced in the Manawatu / Taranaki area since at least the 1920s. Anticyclones predominated in April and July, with northerlies or northwesterlies in May and June. Strong south westerlies and deep depressions in the Chatham Islands area, dominated the remainder of the year from August through to December. A weak El Niño prevailed in the equatorial Pacific from August onwards, which was one of the factors promoting more south westerlies. Sea temperatures around New Zealand fluctuated during the year.

## **EXTREMELY HIGH RAINFALL IN SEVERAL NORTH ISLAND REGIONS; DRIER IN KAIKOURA AND EASTERN OTAGO**

2004 was one of the wettest years on record in parts of Bay of Plenty, Manawatu, Kapiti, Upper Hutt and the Wairarapa. Rainfall was more than 125 percent of normal in Manawatu, Wanganui, eastern Bay of Plenty, Horowhenua, and Wairarapa, and at least 110 percent of normal in Waikato, King Country, south Taranaki, Wellington, western Bay of Plenty, Gisborne, Nelson, and Southland. Totals were 75 to 90 percent of average in coastal Marlborough, and eastern Otago. Rainfall was near normal elsewhere.

Of the four main centres, Christchurch was the driest with 643 mm (102% of average) and Wellington the wettest with 1447 mm (116% of average). Auckland received 1331 mm (107%) and Dunedin 765 mm (94%). Middlemarch, in eastern Otago, was the driest of the sites where NIWA measured rainfall, with only 441 mm (85% of average), followed by Alexandra with 492 mm in Central Otago (134% of average). Of the regularly reporting rainfall stations, the wettest location in 2004, 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 10960 mm.

Extremes of annual rainfall for the year 2004 were measured at:

| Location                 | 2004<br>rainfall<br>(mm) | Percentage<br>of normal | Year<br>Records began | Comments                |
|--------------------------|--------------------------|-------------------------|-----------------------|-------------------------|
| Whakatane Airport        | 1539                     | 133                     | 1975                  | 2 <sup>nd</sup> highest |
| Castlepoint              | 1367                     | 140                     | 1902                  | 2 <sup>nd</sup> highest |
| East Taratahi            | 1298                     | 139                     | 1973                  | Highest                 |
| Hicks Bay                | 1921                     | 138                     | 1993                  | Highest                 |
| Mahia AWS                | 1583                     | 156                     | 1992                  | Highest                 |
| Paraparaumu Airport      | 1445                     | 140                     | 1945                  | Highest                 |
| Palmerston North Airport | 1173                     | 132                     | 1944                  | Highest                 |
| Palmerston North         | 1355                     | 140                     | 1929                  | Highest                 |
| Wallaceville             | 1760                     | 133                     | 1924                  | 2 <sup>nd</sup> highest |
| Farewell Spit            | 1678                     | 130                     | 1875                  | Highest                 |
| Tiwai Point              | 1530                     | 138                     | 1971                  | Highest                 |

### COOLEST YEAR OVERALL IN MORE THAN A DECADE

The 2004 national average temperature, calculated by NIWA, was 12.3°C, 0.3°C below the 1971 – 2000 normal, and the lowest since 1993. For New Zealand as a whole, there were seven cooler than average months (February through April, and July through September, and December), four warmer than average months (January, May, June and November), and one month with mean temperatures close to the climatological average (October). The warmest locale was Whangarei, with a mean temperature for the year of 15.3°C (0.3°C below average).

2004 mean temperatures were about 0.3°C below average in most regions, but at least 0.7°C below average in parts of Auckland, King Country, inland Bay of Plenty, coastal Wairarapa, Buller, and inland areas of the South Island.

Lower than normal mean temperatures for the year 2004 were measured at:

| Location          | Mean<br>temperature<br>(°C) | Departure<br>from normal | Year<br>Records<br>began | Comments               |
|-------------------|-----------------------------|--------------------------|--------------------------|------------------------|
| Warkworth         | 13.7                        | -0.8                     | 1973                     | Lowest                 |
| Rotorua Airport   | 12.0                        | -0.8                     | 1964                     | 3 <sup>rd</sup> lowest |
| Taumarunui        | 12.0                        | -1.0                     | 1948                     | Lowest                 |
| Castlepoint       | 12.9                        | -1.2                     | 1973                     | Lowest                 |
| Wanaka Airport    | 9.8                         | -0.8                     | 1993                     | 2 <sup>nd</sup> lowest |
| Manapouri Airport | 8.5                         | -0.7                     | 1992                     | 2 <sup>nd</sup> lowest |
| Clyde             | 9.5                         | -1.0                     | 1984                     | 2 <sup>nd</sup> lowest |
| Tiwai Point       | 9.8                         | -0.8                     | 1971                     | Lowest                 |

## SUNNY IN EAST OTAGO, NEAR NORMAL ESLEWHERE

Sunshine hours were more than 105 percent of normal in coastal Otago, less than 95 percent of normal in Waikato, Taupo, Manawatu, south Taranaki, and the Southern Lakes, and near normal in all other regions. Nelson was the sunniest centre in 2004, recording 2457 hours, followed by Blenheim with 2393 hours, and then Tauranga with 2360 hours. Total sunshine hours for the year 2004 in selected main centres were:

| Location     | 2004<br>Sunshine<br>(hours) | Normal<br>(hours) | Departure from<br>normal | Comments     |
|--------------|-----------------------------|-------------------|--------------------------|--------------|
| Auckland     | 2066                        | 2019              | +2%                      | Near normal  |
| Wellington   | 2073                        | 2064              | 0%                       | Near normal  |
| Christchurch | 2096                        | 2100              | 0%                       | Near normal  |
| Dunedin      | 1746                        | 1597              | +9%                      | Above normal |
| Invercargill | 1664                        | 1609              | +3%                      | Near normal  |

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/4 of 20 pages

## **SIGNIFICANT WEATHER AND CLIMATE EVENTS - 2004**

### **FLOODS AND HIGH RAINFALL**

There were at least 28 heavy rainfall events during 2004, of which many produced floods, mainly in the North Island. The event that produced the Manawatu/Rangitikei floods in mid February was very extensive and by far the most destructive.

- **18-23 January**

A depression brought significant rainfall to the lower North Island from the 18<sup>th</sup>-23<sup>rd</sup>, with heavy falls, totalling 50 to 100 mm in Wairarapa on the 20<sup>th</sup>.

- **29-30 January**

High rainfall totalling 150 to 200 mm occurred in parts of Northland, especially Kaitaia, from the 29-30<sup>th</sup>. Rainfall totalling 74 mm was measured at St Bathans (Otago) and the 30<sup>th</sup>, with reports of flash flooding in the Wanaka district.

- **February overall**

More than 1000 mm was recorded in the Tararua Ranges for the month. This was due to a number of high rainfall-flood producing events, on the 1<sup>st</sup>, and especially between the 14<sup>th</sup> and 18<sup>th</sup> of February. The latter, produced the most disastrous floods in the Wanganui, Manawatu/Rangitikei region for many decades, as well as flooding in southern Hawkes' Bay, Wairarapa, Lower Hutt, and Picton. Hundreds of people were left homeless, considerable areas of farmland were inundated by silt and floodwaters, many rivers breached their banks, sheep and cattle stock were drowned or swept away by floodwaters, many bridges were damaged, and numerous roads closed, along with power, gas and water supply outages to tens of thousands of people. The cost of damage resulting from the floods has well exceeded \$200 million. Further flood producing rainfall occurred in parts of Northland, Auckland, Coromandel, Waikato, Bay of Plenty, King Country, and Taranaki on the 28<sup>th</sup>.

- **1-5 February**

Heavy rainfall occurred throughout Northland, Auckland, Waikato, Taranaki, Wanganui, Wellington, Marlborough, and Westland, totalling 50-100 mm in the 24 hours to 9am on the 2<sup>nd</sup> in many areas. There were floods at Castor Bay and Hillsborough on the North Shore, in Auckland, with 55 mm in 2 hours during the morning of 2 February. Crail Bay, in Pelorus Sound, recorded a record for February there (since measurements began in 1983), of 154 mm most of which fell in about 15 hours during the night of 1/2 February. Rainfall later spread to western Bay of Plenty and Fiordland, totalling about 60 mm for the 24 hours to 9am on the 3<sup>rd</sup>. Heavy rainfall occurred throughout Auckland and around East Cape totalling 50-70 mm in the 24 hours to 9am on the 5<sup>th</sup> in many areas.

- **9-12 February**

Heavy rainfall occurred in Fiordland and the Southern Alps, totalling 116 mm in the 24 hours to 9am on the 10<sup>th</sup> at Mt. Cook Village. Rainfall occurred later in Ruapehu, totalling about 82 mm for the 24 hours to 9am on the 12<sup>th</sup>. The Hutt River overflowed near Melling after heavy rainfall on the 12<sup>th</sup>, flooding adjacent roads.

- **14-16 February**

High rainfall occurred around East Cape totalling 129 mm in the 24 hours to 9am on the 15<sup>th</sup>. Further widespread rainfall totalling 65-150 mm occurred in the 24 hours to 9am on the 16<sup>th</sup> in many population centres (with very much higher totals in excess of 250 mm in the high-country of the Tararua and Orongaronga Ranges) throughout the southwestern North Island, from Taranaki to Wellington, as well as in southern Hawke's Bay, and Wairarapa. A civil state of emergency was declared in Wanganui, Manawatu and Rangitikei, the towns of Scotts Ferry, Waitotara, Fielding, Tangimoana, Longburn, Marton, and Hunterville being badly affected by floodwaters. Hundreds of people were left homeless, considerable areas of farmland including crops were inundated by silt and floodwaters, many rivers breached their banks, sheep and cattle stock were drowned or swept away by floodwaters, many bridges were damaged, and numerous roads closed, along with power, gas and water supply outages to tens of thousands of people. The towns of Woodville, Waipukurau, Martinborough, and the city of Wanganui were also affected as nearby rivers flooded. On the 16<sup>th</sup> the Wellington region was also suffered, with about 500 people in Lower Hutt evacuated due to

floodwaters. Many commuters were unable to enter Wellington, as sections of some roads out of the city were closed, including the rail service from the Hutt Valley.

Record high 1-day rainfall was recorded at:

| Location | Rainfall (mm) | Date    | Year<br>Records began | Comments              |
|----------|---------------|---------|-----------------------|-----------------------|
| Waiouru  | 134           | 15 Feb. | 1950                  | Highest for any month |
| Ohakune  | 123           | 15 Feb. | 1974                  | Highest for any month |

- **17-18 February**

Rainfall totalling over 100 mm occurred in Fiordland, with rainfall totalling 50-80 mm spreading to the Southern Lakes, Westland, Wanganui and Taranaki on the 18<sup>th</sup>. Parts of Picton and Waikawa Bay were flooded after heavy rainfall on the 18<sup>th</sup>. Picton recorded 40mm in 40 minutes. A civil emergency was declared due to a threat of possible dam burst.

- **20-23 February**

Rainfall totalling 100-200 mm occurred in Fiordland, south Westland, and the Southern Lakes.

- **28 February**

A depression from the Tasman Sea and the remnants of tropical cyclone Ivy produced further high rainfall, totalling over 100 mm in parts of Northland, Coromandel, Waikato, Bay of Plenty, King Country, and Taranaki. 30 houses were flooded in Turangi as the Tongariro River overflowed its banks

- **10 March**

High rainfall totalling 224 mm occurred in Mt. Cook Village on the 10<sup>th</sup>.

- **8 and 27/28 April**

High intensity rainfall totalling 124 mm occurred in Motueka on the 8<sup>th</sup>. Further high rainfall totalling 207 mm occurred at Tauranga Airport over the 27-28<sup>th</sup> (130 mm in the 28<sup>th</sup>). Rainfall exceeded 100 mm in other parts of Bay of Plenty during the same period. The high rainfall was the highest there since 2001, and resulted in floods, as drains were unable to cope with the deluge.

- **1, 12, 14, 23 and 28 May**

High rainfall totalling 50-100 mm occurred in Northland, Auckland, and Coromandel on the 1<sup>st</sup>, with further high rainfall in Coromandel, and western Bay of Plenty, on the 14<sup>th</sup>. Rainfall totalling 88 mm was recorded in Takaka on the 12<sup>th</sup>, with 50 mm in Gisborne on the 23<sup>rd</sup>. The month ended with 50-65 mm rainfalls in parts of Northland, Rotorua, and Golden Bay on the 28<sup>th</sup>.

- **15, 18, and 29/30 June**

Significant high intensity rainfall totalling 106 mm occurred at Arapito on the 15<sup>th</sup>, 101 mm in Motueka on the 18<sup>th</sup>, and 96 mm at Westport on the 20<sup>th</sup>. Surface flooding, after several consecutive days of rainfall to the 21<sup>st</sup> closed SH43 between Stratford and Taumarunui, and SH32 between Tokoroa and Whakamaru. Flooding also occurred on SH1 between Taupo and Turangi. SH4, 54 km north of Wanganui, was blocked by a landslide, and slips blocked a lane in the Manawatu Gorge. A slip also closed SH2 south of Opotiki in the eastern Bay of Plenty. Rainfall and flooding affected the East Cape/Gisborne region on the 29<sup>th</sup> and 30<sup>th</sup>, as a deep depression brought gale force southeasterlies to the district. Rainfall totals of 150 to 180 mm were reported between Te Puia and Tologa Bay. Rainfall totalled 153 mm at Hicks Bay and over 50 mm in Gisborne on the 29<sup>th</sup>. A number of residents were evacuated due to flooding in Mangatuna. A large land slip blocked SH35 near Potaka, with damage to roads between Anaura Bay and Waihou Bay, and also near Wairoa. Gales also affected Hawke's Bay, where 11,000 homes were out of power due to fallen trees.

- **15-18 July**

Prolonged rainfall, often heavy in intensity, occurred in Bay of Plenty, between the 15<sup>th</sup> and 18<sup>th</sup> of July resulting in severe, devastating, flooding, slips and landslides, cuts to water supply, and a state of emergency, throughout the Rangitaiki Plains in the eastern Bay of Plenty. About 2000 people were evacuated from their homes, with a further 2000 people on standby. Edgecumbe, Te Teko, and Whakatane were the worst affected areas, with people also evacuated from part of Opotiki. More than 17,000 people faced shortages of

drinking water. Much of SH2 was blocked. The flooding was reported to be the worst in the district in living memory. Whakatane Airport recorded rainfall totalling 246 mm for the 48 hours to 9am on the 18<sup>th</sup> (the highest 2-day rainfall there, well in excess of the previous maximum, in records back to 1974), and 140 mm in 24-hours. Opotiki recorded even higher rainfall, totalling 280 mm in 48-hours. At least 500 evacuees were still unable to return to their homes and large areas of low-lying farmland remained swamped at the end of the month. The damage bill is expected to be in the tens of millions of dollars.

- **11-14 and 17-19 August**

High rainfall in Fiordland and the Southern Alps from the 11<sup>th</sup> to 14<sup>th</sup>, totalling 434 mm at Milford Sound, of which 202 mm occurred on the 11<sup>th</sup>. High rainfall accompanied a wind storm from the 17-19th, with surface flooding in Lower Hutt and Masterton, with rainfall totalling 50-100 mm in many areas, and as much as 140 mm in the Orongaronga Ranges. There were many slips. Buses from the Hutt Valley were also cancelled, and several schools were closed. Thousands of commuters could not make it to work.

- **28-September**

The same weather system that brought snowfall to Canterbury on the 28<sup>th</sup> also produced high rainfall and surface flooding in parts of Manawatu. The Manawatu River and Te Horo stream were in flood; the latter breaching its banks southwest of Otaki and the former on SH 57 between Shannon and Palmerston North. Several houses were evacuated due to flooding in Foxton, and two in Pahiatua. Landslips occurred between the Manawatu Gorge and Woodville.

- **15 October**

Thunderstorms produced high intensity rainfall in Napier, where up to forty people were evacuated, many cars stranded, phones out, about 300 houses were without electricity, and nine schools were closed. Steady, but heavy, rainfall occurred at Napier Airport, totalling 42.4 mm in the 3-hours to 4am, with intensities as much as 15 mm in an hour. An unofficial total of 143 mm was reported in Tamatea, where flooding was worst, with water up to 1 m deep in some roads. High rainfall and surface flooding also occurred on the same day in Pongaroa, totalling 130 mm in 12-hours.

- **19-20 November**

Heavy rainfall totalling 252 mm was recorded at Milford Sound for the 24 hours to 9am on the 20<sup>th</sup>.

- **28-30 December**

Rainfall totalled at least 60 mm occurred in the Bay of Islands on the 29<sup>th</sup> and Bay of Plenty on the 30<sup>th</sup>. The 28-29<sup>th</sup> was also very wet in Buller and Westland, with 162 mm in Takaka on the 29<sup>th</sup> and 280 mm for the 2-day period recorded at Franz Josef.

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

| Location            | Rainfall (mm) | Percentage of normal for the month | Year Records began | Comments                |
|---------------------|---------------|------------------------------------|--------------------|-------------------------|
| <b>January</b>      |               |                                    |                    |                         |
| Kaitaia             | 174           | 204                                | 1986               | 3 <sup>rd</sup> highest |
| Waione              | 174           | 238                                | 1992               | Highest                 |
| East Taratahi       | 102           | 208                                | 1973               | Highest                 |
| Haast               | 512           | 252                                | 1986               | Highest                 |
| <b>February</b>     |               |                                    |                    |                         |
| Cape Reinga         | 266           | 372                                | 1920               | 3 <sup>rd</sup> highest |
| Kaitaia Observatory | 309           | 401                                | 1986               | Highest                 |
| Kerikeri            | 347           | 366                                | 1982               | 2 <sup>nd</sup> highest |
| Kerikeri Airport    | 342           | 325                                | 1979               | 2 <sup>nd</sup> highest |
| Mokohinau Island    | 220           | 479                                | 1935               | 2 <sup>nd</sup> highest |
| Warkworth           | 230           | 224                                | 1973               | Highest                 |
| Henderson           | 240           | 376                                | 1986               | Highest                 |
| Owairaka            | 277           | 424                                | 1949               | 2 <sup>nd</sup> highest |
| Auckland Airport    | 272           | 417                                | 1962               | Highest                 |
| Pukekohe            | 210           | 252                                | 1979               | Highest                 |
| Whitianga Airport   | 280           | 318                                | 1988               | Highest                 |

|                          |     |     |      |                            |
|--------------------------|-----|-----|------|----------------------------|
| Matamata, Hinuera        | 228 | 283 | 1921 | 3 <sup>rd</sup> highest    |
| Tauranga Airport         | 237 | 304 | 1898 | Well above normal          |
| Te Puke                  | 320 | 325 | 1973 | Highest                    |
| Hamilton, Ruakura        | 220 | 311 | 1906 | 3 <sup>rd</sup> highest    |
| Hamilton Airport         | 332 | 496 | 1936 | 2 <sup>nd</sup> highest    |
| Port Taharoa             | 314 | 457 | 1974 | Highest                    |
| Rotorua Airport          | 283 | 279 | 1964 | 2 <sup>nd</sup> highest    |
| New Plymouth             | 398 | 416 | 1863 | 2 <sup>nd</sup> highest    |
| Lower Retaruke           | 420 | 478 | 1962 | Highest                    |
| Taupo Airport            | 181 | 265 | 1976 | Highest                    |
| Turangi                  | 395 | 388 | 1968 | Highest                    |
| Waione                   | 289 | 339 | 1992 | Highest                    |
| Castlepoint              | 223 | 308 | 1902 | 2 <sup>nd</sup> highest    |
| East Taratahi            | 232 | 487 | 1973 | Highest                    |
| Martinborough            | 235 | 571 | 1951 | Highest                    |
| Hicks Bay                | 350 | 454 | 1991 | Highest                    |
| Paraparaumu Airport      | 361 | 648 | 1945 | Highest for any month ever |
| Palmerston North Airport | 271 | 469 | 1944 | Highest                    |
| Palmerston North         | 299 | 476 | 1929 | Highest                    |
| Levin                    | 269 | 446 | 1896 | Highest                    |
| Wellington, Kelburn      | 364 | 587 | 1862 | Highest                    |
| Wellington Airport       | 291 | 568 | 1960 | Highest                    |
| Wallaceville             | 403 | 629 | 1924 | Highest                    |
| Stratford                | 638 | 535 | 1961 | Highest                    |
| Normanby                 | 187 | 405 | 1978 | Highest                    |
| Ohakune                  | 375 | 490 | 1975 | Highest                    |
| Waiouru                  | 307 | 515 | 1951 | Highest                    |
| Wanganui, Spriggens Park | 239 | 361 | 1890 | Highest                    |
| Farewell Spit            | 346 | 672 | 1875 | Highest                    |
| Takaka                   | 339 | 322 | 1986 | Highest                    |
| Arapito                  | 256 | 181 | 1979 | 2 <sup>nd</sup> highest    |
| Hokitika Airport         | 347 | 209 | 1964 | Highest                    |
| Reefton                  | 260 | 255 | 1961 | Highest                    |
| Blenheim Research        | 124 | 187 | 1930 | 2 <sup>nd</sup> highest    |
| <b>April</b>             |     |     |      |                            |
| Tiwai Point              | 200 | 191 | 1971 | 2 <sup>nd</sup> highest    |
| <b>May</b>               |     |     |      |                            |
| Henderson, Auckland      | 217 | 203 | 1986 | Highest                    |
| Auckland Airport         | 217 | 236 | 1962 | Highest                    |
| Mangere, Auckland        | 191 | 190 | 1959 | 3 <sup>rd</sup> highest    |
| Whitianga Airport        | 304 | 223 | 1991 | 2 <sup>nd</sup> highest    |
| Te Puke                  | 255 | 224 | 1973 | Highest                    |
| Whakatane Airport        | 173 | 219 | 1975 | Highest                    |
| <b>June</b>              |     |     |      |                            |
| Hicks Bay                | 309 | 169 | 1991 | Highest                    |
| Arapito                  | 407 | 205 | 1978 | 2 <sup>nd</sup> highest    |
| Arthurs Pass             | 681 | 194 | 1917 | 3 <sup>rd</sup> highest    |
| Milford Sound            | 962 | 222 | 1930 | 3 <sup>rd</sup> highest    |
| <b>July</b>              |     |     |      |                            |
| Whakatane Airport        | 363 | 345 | 1975 | Highest                    |
| <b>August</b>            |     |     |      |                            |
| Castlepoint              | 216 | 231 | 1902 | 2 <sup>nd</sup> highest    |
| East Taratahi            | 184 | 232 | 1972 | Highest                    |
| Mahia AWS                | 246 | 221 | 1991 | Highest                    |
| Oamaru Airport           | 127 | 299 | 1941 | 2 <sup>nd</sup> highest    |
| Invercargill Airport     | 134 | 188 | 1940 | 3 <sup>rd</sup> highest    |
| Tiwai Point              | 194 | 268 | 1970 | Highest                    |
| <b>September</b>         |     |     |      |                            |
| Campbell Island          | 226 | 201 | 1941 | Highest                    |
| <b>October</b>           |     |     |      |                            |
| Waione                   | 177 | 201 | 1991 | Highest                    |
| <b>December</b>          |     |     |      |                            |
| Kerikeri EWS             | 206 | 199 | 1981 | 2 <sup>nd</sup> highest    |



|                      |     |     |      |                         |
|----------------------|-----|-----|------|-------------------------|
| East Taratahi        | 146 | 268 | 1972 | Highest                 |
| Martinborough        | 209 | 330 | 2001 | Highest                 |
| Ngawi                | 152 | 198 | 1989 | Highest                 |
| Winchmore            | 149 | 249 | 1947 | 2 <sup>nd</sup> highest |
| Timaru Airport       | 141 | 313 | 1956 | 2 <sup>nd</sup> highest |
| Ettrick              | 162 | 222 | 1985 | 2 <sup>nd</sup> highest |
| Gore                 | 215 | 235 | 1971 | Highest                 |
| Nugget Point         | 170 | 209 | 1983 | Highest                 |
| Invercargill Airport | 230 | 231 | 1940 | Highest                 |
| Tiwai Point          | 225 | 253 | 1970 | Highest                 |
| Chatham Islands      | 168 | 306 | 1951 | Highest                 |

## RECORD LOW MONTHLY RAINFALL AND LOW SOIL MOISTURE LEVELS

### January

Continuing dry conditions occurred in parts of Otago and Southland, in the Christchurch area and central Marlborough, where soil moisture deficits are significant. However useful rainfall, particularly in the last week, brought relief to dry soils in Wairarapa, Northland, and other areas in the east of the South Island.

### February

Soil moisture deficits remained significant in parts of central Marlborough, Canterbury, and Otago.

### March

Rainfall was well below average in the northern South Island, many locations recording less than 50 percent of average totals. Moderate soil moisture deficits persisted in parts of central Marlborough, Canterbury, and Otago, with field capacity maintained in western areas of both islands.

### April

Rainfall was well below average over much of the northern half of the North Island until almost the end of the month. Less than 50 percent of average April totals occurred in Northland and Auckland. Soil moisture levels were below average in the north and east of the North Island, with some significant deficits in North and Central Otago.

### November

Rainfall was less than 50 percent of average in Hawke's Bay, resulting in the development of significant soil moisture deficits there.

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

| Location             | Rainfall (mm) | Percentage of normal | Year Records began | Comments                     |
|----------------------|---------------|----------------------|--------------------|------------------------------|
| <b>March</b>         |               |                      |                    |                              |
| Kaitaia Observatory  | 8             | 10                   | 1986               | Lowest                       |
| Kerikeri             | 7             | 5                    | 1936               | 2 <sup>nd</sup> lowest       |
| Kerikeri Airport     | 7             | 5                    | 1978               | Lowest                       |
| Kaikohe              | 5             | 4                    | 1987               | Lowest                       |
| Dargaville           | 9             | 9                    | 1943               | Lowest                       |
| Warkworth            | 11            | 10                   | 1973               | Lowest                       |
| Whangaparaoa         | 6             | 8                    | 1987               | Lowest                       |
| Tiri Tiri Lighthouse | 6             | 8                    | 1946               | Lowest                       |
| Henderson            | 14            | 14                   | 1986               | Lowest                       |
| Owairaka             | 17            | 18                   | 1949               | 2 <sup>nd</sup> equal lowest |
| Auckland Airport     | 8             | 11                   | 1962               | Lowest                       |
| Pukekohe             | 12            | 11                   | 1970               | Lowest                       |
| Whitianga Airport    | 8             | 5                    | 1988               | Lowest                       |
| Paeroa               | 14            | 13                   | 1914               | 2 <sup>nd</sup> lowest       |
| Te Puke              | 9             | 6                    | 1973               | Lowest                       |
| Whakatane Airport    | 16            | 15                   | 1975               | Lowest                       |
| Rotorua Airport      | 10            | 9                    | 1964               | Lowest                       |

|                      |     |     |      |                              |
|----------------------|-----|-----|------|------------------------------|
| <b>April</b>         |     |     |      |                              |
| Cape Reinga          | 18  | 16  | 1920 | 3 <sup>rd</sup> lowest       |
| Owairaka, Auckland   | 39  | 37  | 1949 | 2 <sup>nd</sup> lowest       |
| Pukekohe             | 30  | 27  | 1970 | 2 <sup>nd</sup> lowest       |
| Whitianga Airport    | 38  | 28  | 1991 | Lowest                       |
| Paeroa               | 26  | 24  | 1914 | 3 <sup>rd</sup> lowest       |
| Ruakura              | 24  | 26  | 1906 | 3 <sup>rd</sup> lowest       |
| Waiouru              | 22  | 28  | 1951 | Lowest                       |
| Hokitika Airport     | 88  | 35  | 1964 | 3 <sup>rd</sup> lowest       |
| Franz Josef          | 37  | 8   | 1983 | Lowest                       |
| Mt Cook Village      | 81  | 22  | 1930 | 3 <sup>rd</sup> lowest       |
| Lake Tekapo          | 6   | 12  | 1927 | 3 <sup>rd</sup> equal lowest |
| Wanaka Airport       | 8   | 17  | 1993 | Equal lowest                 |
| <b>June</b>          |     |     |      |                              |
| Kaikoura             | 8   | 10  | 1949 | Lowest                       |
| Rangiora             | 4   | 6   | 1965 | 2 <sup>nd</sup> lowest       |
| Christchurch Airport | 6   | 9   | 1944 | 2 <sup>nd</sup> equal lowest |
| <b>July</b>          |     |     |      |                              |
| Kaikoura             | 16  | 21  | 1949 | 2 <sup>nd</sup> lowest       |
| Dunedin Airport      | 6   | 12  | 1963 | Lowest                       |
| Dunedin, Musselburgh | 11  | 16  | 1918 | 2 <sup>nd</sup> lowest       |
| Manapouri Airport    | 28  | 30  | 1991 | Equal lowest                 |
| <b>September</b>     |     |     |      |                              |
| Kerikeri             | 51  | 28  | 1982 | Lowest                       |
| Kaikohe              | 44  | 33  | 1973 | Lowest                       |
| Whangarei Airport    | 35  | 28  | 1937 | 2 <sup>nd</sup> lowest       |
| Warkworth            | 50  | 36  | 1972 | Lowest                       |
| <b>October</b>       |     |     |      |                              |
| Franz Josef          | 193 | 28  | 1982 | 2 <sup>nd</sup> lowest       |
| Le Bons Bay          | 23  | 25  | 1987 | Lowest                       |
| Waione               | 177 | 201 | 1991 | Highest                      |
| <b>November</b>      |     |     |      |                              |
| Pukekohe             | 44  | 46  | 1987 | Lowest                       |

## SNOWFALL

There were many periods with snowfall, between March and September, being:

- **Unseasonable March snowfall**

A cold southerly outbreak produced snowfall on the Desert Road over the night of the 28/29<sup>th</sup>, resulting in a temporary closure, with scattered hail in exposed eastern regions. This is the earliest significant snowfall event in the year for the Desert Road since 22 March 1993 when 5cm occurred.

- **6 April**

A cold southerly outbreak produced snowfall in Canterbury near the foothills on the 6<sup>th</sup>, with snow a few cm of snow lying at both Oxford and Darfield. The air temperature at Snowden was just 3°C at 3pm that afternoon. Snowfall occurred to about 500 m in the North Island on the same day.

- **24 May**

Snow settled in Methven on the 24<sup>th</sup>.

- **1 and 22 June**

Cold southwesterlies brought snowfall to the central North Island on 1 June, closing the Desert Road. Further cold southwesterlies produced heavy snowfall in Central Otago, Arthur's Pass, Nelson Lakes, and the Ruapehu/Tongariro district of the central North Island on 22 June, resulting in the closure of SH94 between Te Anau and Milford Sound, SH1 between Waiouru and Rangipo, and other alternative routes SH49 between Ohakune and National Park, and the route to Whakapapa Village on Tuesday due to snow and ice, with motorists stranded in the snow.

- **3-4, 23, and 28 July**

The North Island's Desert Road SH1 was closed between Waiouru and Taihape due to snowfall, as much as 20 cm deep, on the 3<sup>rd</sup> and 4<sup>th</sup> of July, and several motorists had to be rescued. SH4 at National Park and SH47 from National Park to Turangi were also closed, and about 50 cm of fresh snow was reported on Turoa ski field. The Desert road was closed due to further snowfall on the 23<sup>rd</sup>. Snowfall also occurred on the Taupo to Napier highway on the same day, with up to 100 trucks, and also motorists, stranded between Rangitaiki and Te Pohue. Cold southerlies brought further snowfall to 500m in inland high country areas of Canterbury on the 28<sup>th</sup>.

- **15-19 and 22-28 August**

Snow fell to low levels in the east of the South Island on the 15th, from Southland to Canterbury, with depths to 10 cm in some inland areas, and also at the summit of the Rimutaka Hill Road north of Wellington. Dunedin Airport was closed, along with SH1 north and south of the city. Several Dunedin schools were closed. Further snowfall from the 17-19<sup>th</sup> resulted in the closure of many central North Island high country roads, including the Napier-Taupo highway. More, bitterly cold, southerlies spread over New Zealand from the 22<sup>nd</sup>, followed by snowfall to near sea level in the east of the South Island, and sleet and hail in the south and east of the North Island, with snow closing roads near Dunedin, as well as many central North Island high country roads (20-30 cm on the Desert Road) and the Rimutaka Hill Road. Further snowfall occurred to near sea level in Canterbury on the 27/28<sup>th</sup> and as low as 300 m in the lower North Island (including the Kapiti hill country and the Orongorongo Ranges). As much as 20 cm of snowfall was reported near the summit of the Rimutaka Hill Road.

- **18/19 and 28 September**

Snowfall and low temperatures occurred in inland areas of Southland and Otago on the 18/19<sup>th</sup>, during which time thousands of newborn lambs died from exposure. Further snowfall occurred in inland areas of Canterbury on the 28<sup>th</sup>, also with a loss of newborn lambs from exposure. Snowfall also occurred on the Desert Road, the Rimutaka Hill Road, SH1 between Kaikoura and Cheviot, and most South Island high country passes.

- **23 and 25 November**

Cold southerlies brought snowfall to parts of the Otago high country on the 23<sup>rd</sup> and 25<sup>th</sup>.

- **18-19 December**

Rough weather buffeted the country over the weekend of 18-19 December, a very cold and unseasonable southerly outbreak bringing gale force southerlies to exposed southern and eastern areas. Snowfall occurred as low as 600m in the South Island, with a light fall on the Desert Road in the central North Island. Temperatures were 6-8 °C below normal in many southern and eastern regions.

## **ELECTRICAL STORMS**

- **29 April**

Violent electrical storms occurred over Stanmore Bay, Whangaparoa Peninsula on the 29<sup>th</sup>, resulting in power outages.

- **22 June**

Lightning severely damaged an Auckland house, cracking the ceiling, destroying electrical connections and equipment, smashing glass windows, and damaging roofing tiles.

- **19 December**

A fire occurred in a house after a lightning strike.

## **SEVERE OR DAMAGING HAIL STORMS**

- **6 April**

Hail was widespread throughout Wanganui, after a 30-minute storm that struck about 3.30 pm producing a thick layer of hailstones (up to 20 cm deep in places) whitening the ground in the city, damaging roofs, and causing disruptions to traffic.

- **5 and 7 July**

Extensive damage to shops and stock occurred due to flooding after a heavy hailstorm in Hokitika on the 5<sup>th</sup>. Another heavy hailstorm occurred southwest of New Plymouth affecting roads and traffic near Oakura on SH45 on the 7<sup>th</sup>.

- **12 and 27/28 August**

Isolated large hailstones were reported in Upper Hutt associated with thunderstorms on the 12<sup>th</sup>, and again in the Wellington region on the 27/28<sup>th</sup>.

- **17/18 October**

On the 17<sup>th</sup>, thunderstorms with hailstones “the size of peas” affected Carterton for about 15 minutes during the late afternoon. Hail also struck several Hawke’s Bay orchards at about 3 am on the 18<sup>th</sup> resulting in damage to apples and stonefruit, one orchardist noting that it was “the worst he had seen”.

- **29/30 November**

Thick hail blocked guttering and melting water flooded several shops, with power outages in Oamaru over the night of 29/30 November.

- **18-19 December**

Hail covered roads in Auckland, and thick hail covered the beach at Port Waikato during thunderstorms on the 19<sup>th</sup>. Hailstones ruined fruit in parts of Auckland, Hawke’s Bay, Tasman, and Canterbury.

## **TORNADOES, GALES, HIGH WINDS, AND ROUGH SEAS**

- **20-21 January**

A depression produced high winds in Hawke’s Bay (gusts to 109 km/h at Napier Airport on the 20<sup>th</sup>) and severe southerly gales through Cook Strait (with gusts to 174 km/h at Baring Head and 146 km/h at Brothers Island on the 21<sup>st</sup>). The severe gales and high seas resulted in the cancellation of fast-ferry sailings for two days.

- **Windy February**

February was very much windier than usual in throughout much of the North Island and western South Island, due to a lack of anticyclones and frequent depressions tracking south of the country. Wind indices show it was a month with the strongest westerlies ever over the North Island in records back to 1941. Some wind gust statistics are:

Days with wind gusts to at least 60 km/h

| Location             | Days<br>Feb 2004 | Departure<br>from normal | Year<br>Records<br>began | Comments                |
|----------------------|------------------|--------------------------|--------------------------|-------------------------|
| Auckland Airport     | 12               | +7                       | 1963                     | Highest                 |
| Tauranga Airport     | 8                | +5                       | 1959                     | Highest                 |
| Rotorua Airport      | 9                | +7                       | 1966                     | Highest                 |
| Taupo Airport        | 9                | +5                       | 1982                     | Highest                 |
| Napier Airport       | 10               | +4                       | 1955                     | 2 <sup>nd</sup> highest |
| Castlepoint          | 23               | +6                       | 1972                     | Highest                 |
| New Plymouth Airport | 10               | +4                       | 1954                     | Highest                 |
| Levin                | 11               | +8                       | 1967                     | Highest                 |
| Paraparaumu Air.     | 13               | +5                       | 1954                     | Highest                 |
| Wellington, Kelburn  | 24               | +5                       | 1967                     | Equal highest           |
| Westport Airport     | 7                | +3                       | 1954                     | Equal highest           |
| Hokitika Airport     | 10               | +6                       | 1954                     | Highest                 |

- **14-16 February**

Gale force southerlies, buffeted parts of the North Island, as a depression intensified east of Wairarapa, from the afternoon of the 15<sup>th</sup> into the morning of the 16<sup>th</sup>. High seas with swells of 9 m to 11 m were reported

through Cook Strait. Ferry sailings were cancelled (for 1800 people) and considerable delays occurred at Wellington airport (where 200 passengers stayed overnight) and other airports due to high winds. Power cuts affected parts of Wellington during the evening of Wellington on the 15<sup>th</sup>. There were also many fallen trees, especially in the Auckland region (where 100s were reported). Winds gusted to 119 km/h in Wellington, and at the airport it was the most severe southerly storm since May 1992, and most severe February southerly event since 1967. High gusts of 230 km/h occurred in the Tararua Range, 161 km/h at Brothers Island, 154 km/h at Mt Kaukau,, and 135 at Cape Reinga on the 15<sup>th</sup>. Gusts to 163 km/h were measured at Castlepoint, 161 km/h at Mt Kaukau, 156 km/h at Baring Head, and 154 km/h at Brothers Island on the 16<sup>th</sup>.

- **21 February**

Northwesterlies gusted to 178 km/h at Mt. Cook Village, 167 km/h at Mt Kaukau, 163 km/h at Castlepoint, 146 km/h at Baring Head, 139 km/h at Paraparaumu Airport (the highest gust at the airport since November 1982), 137 km/h at Kelburn (the highest February wind gust there since at least 1971), and 135 km/h at Brothers Island.

- **24 February**

Gale force southwesterlies gusted to 119 km/h at Musselburgh in Dunedin, the highest there since November 1984, with gusts to 180 km/h reported in more exposed areas.

- **28 February**

A depression from the Tasman Sea and the remnants of tropical cyclone Ivy produced storm force northeasterlies gusting to 120 km/h at Cape Reinga, with gales also affecting Auckland.

- **5 May**

Gale force northwesterlies buffeted Wellington on the 5<sup>th</sup>, with gusts to 148 km/h at Beacon Hill and 143 km/h at Mt Kaukau. Several house roofs were lifted and windows broken by the wind in some hill suburbs.

- **22 June**

High winds, with gusts to 130 km/h buffeted exposed parts of Auckland on 22 June, felling trees and lifting roof tiles.

- **22 July**

Storm force southerlies occurred, with gusts to 115 km/h, high seas and 7 m swells through Cook Strait on the afternoon of the 22<sup>nd</sup>, during which time the Aratere endured an 8-hour journey to Wellington when mechanical problems occurred.

- **15 August**

A very destructive tornado occurred in Taranaki, leaving at least a 1 km path of damage, destroying a house near Waitara, and resulting in the death a woman and one child.

- **17-19 August**

Storm force southerlies (mean speeds at least 89 km/h) and very high seas (averaging 9m swells, periodically up to 11m) occurred through Cook Strait and in Wellington. At Wellington Airport there were 20 hours with mean wind speeds of at least 74 km/h and gusts in excess of 100 km/h from the evening on the 17<sup>th</sup> through the 18<sup>th</sup>. The highest gust recorded was 183 km/h at Baring Head, with hurricane force mean speeds as high as 140 km/h. This was the worst southerly storm to affect Wellington in more than a decade. High rainfall accompanied the storm, with surface flooding in Lower Hutt and Masterton. There were many slips, fallen trees, power outages due to lines down, and road closures. Huge waves broke over southern coastal roads. Roofs were lifted and many windows blown out. Cladding was blown off an airport hangar, and some of Wellington airport roofing was lifted. All Wellington trains, flights, and ferry sailings were cancelled. Buses from the Hutt Valley were also cancelled, and several schools were closed. Thousands of commuters could not make it to work. .

High southerly wind gusts were recorded at:

| Location            | Highest gust (km/h) | Date of occurrence |
|---------------------|---------------------|--------------------|
| Castlepoint         | 135                 | 17 <sup>th</sup>   |
| Baring Head         | 183                 | 18 <sup>th</sup>   |
| Mt. Kaukau          | 178                 | 18 <sup>th</sup>   |
| Wellington, Kelburn | 135                 | 18 <sup>th</sup>   |
| Wellington Airport  | 119                 | 18 <sup>th</sup>   |
| Brothers Island     | 161                 | 18 <sup>th</sup>   |

- **18, 22 and 24 September**

High wind gusts in excess of 150 km/h occurred at well-exposed sites on several occasions during the month, with 167 km/h recorded at South West Cape on the 18<sup>th</sup>, 152 km/h at Castlepoint on the 22<sup>nd</sup>, and 156 km/h at Baring Head on the 24<sup>th</sup>.

- **14 and 17 October**

Thousands of houses were without power as gale force winds (speeds of 100 km/h were reported) toppled trees in the Golden Bay district on the 14<sup>th</sup>. A tornado was seen forming over land, but did not reach the ground, between Carterton and Masterton during the late afternoon on the 17<sup>th</sup>.

- **15 and 28 November**

Rough weather, including thunderstorms, high winds, and heavy rainfall buffeted many parts of the upper North Island on the 15<sup>th</sup>, especially Gisborne where 8000 houses were temporarily without electricity, and Auckland with some roofs damaged and trees fallen. High winds, with speeds gusting to over 130 km/hr in Hawke's Bay uprooted a tree near Hastings which hit a vehicle and killed two people on the 28<sup>th</sup>.

- **18-19 & 22 December**

Rough weather buffeted the country over the weekend of 18-19 December, a southerly outbreak bringing gale force southerlies to exposed southern and eastern areas. Damaging winds occurred in Auckland, and Cook Strait ferries had long delays due to high seas, with swells up to 8 m, the 7pm sailing of the Lynx being cancelled. Damaging winds associated with a small tornado occurred in Penrose and Mt Wellington, Auckland on the 22<sup>nd</sup>, with some windows broken, damage occurring to about six houses. The winds were strong enough to move a truck.

## **FOUR WARMER MONTHS, SEVEN COOLER, ONE NEAR AVERAGE**

For New Zealand as a whole, there were four warmer than average months (January, May, June and November), seven cooler than average months (February through April, and July through September, plus December), and one near average month (October). Some highlights were:

### **HIGH TEMPERATURES**

- **Mid-summer heat wave and 11<sup>th</sup> warmest January on record**

The year began with a mid-summer heat wave in Canterbury, Darfield recording 38.4°C on New Year's Day, equal to the highest January temperature on record for the South Island, and second only to 38.9°C recorded in Ruatoria in the North Island on 11 January 1979. January mean temperatures were above normal over much of New Zealand, being 1.0 to 2.0°C above average in most eastern districts from Wairarapa to Southland. The national average temperature of 18.3°C was 1.2°C above normal, the 11<sup>th</sup> warmest January since reliable measurements commenced in the 1850s. Mean daily maximum temperatures were almost 4°C above normal in inland parts of Wairarapa, and 2 to 3°C above average in parts of central Marlborough and Otago.

- **Late-autumn heat wave**

The highest May 2004 temperature was 27.3°C, recorded at Nelson Park, Napier on the 2<sup>nd</sup>, a new May all-time record for the North Island.

- **June- 5<sup>th</sup> warmest on record**

The June national average temperature of 9.8°C was 1.3°C above normal, and 5<sup>th</sup> highest for June since reliable measurements commenced in the 1850s. Only June 2003 (10.3°C), 1971 (10.3°C), 1916 (9.9°C), and 2002 (9.8°C) were warmer. Mean temperatures were above average everywhere, being 1.5 to 2.5°C above average throughout much of the eastern South Island from Marlborough to Central Otago as well as Wairarapa.

- **Spring heat wave**

The highest October 2004 temperature was 29.0°C, recorded at Nelson Park, Napier on the 29<sup>th</sup>. This was Napier's highest October temperature since 31.3°C (their record) in 1961, and 3<sup>rd</sup> highest since measurements commenced in 1868. Nelson Park also recorded 28.5°C, this month, on the 14<sup>th</sup>.

Extremes of maximum temperature in 2004 were recorded at:

| Location            | Maximum temperature (°C) | Records began | Date of occurrence | Comments                            |
|---------------------|--------------------------|---------------|--------------------|-------------------------------------|
| <b>January</b>      |                          |               |                    |                                     |
| Darfield            | 38.4                     | 1939          | 1 <sup>st</sup>    | Highest for January                 |
| Woodbury            | 37.0                     | 1994          | 1 <sup>st</sup>    | Highest for January                 |
| Timaru Airport      | 36.1                     | 1962          | 1 Jan.             | Highest for January                 |
| Winchmore           | 35.8                     | 1950          | 1 Jan.             | 2 <sup>nd</sup> highest for January |
| Hororata            | 36.0                     | 1962          | 1-2 Jan.           | Highest for January                 |
| Culverden           | 35.0                     | 1984          | 1-2 Jan.           | Highest for January                 |
| Snowden             | 34.7                     | 2000          | 3 Jan.             | Highest for January                 |
| Middlemarch         | 35.0                     | 2001          | 3 Jan.             | Highest for January                 |
| Kerikeri EWS        | 30.3                     | 1982          | 9 Jan.             | Highest for any month               |
| Whangarei Airport   | 31.0                     | 1968          | 9 Jan.             | Highest for any month               |
| Whitianga Airport   | 30.3                     | 1991          | 12 Jan.            | Highest for January                 |
| Waione              | 33.5                     | 1992          | 3 Jan.             | Highest for any month               |
| Castlepoint         | 32.2                     | 1973          | 3 Jan.             | Highest for any month               |
| East Taratahi       | 34.2                     | 1973          | 3 Jan.             | Highest for January                 |
| <b>March</b>        |                          |               |                    |                                     |
| Kaikoura            | 31.7                     | 1964          | 10 Mar.            | 2 <sup>nd</sup> highest for March   |
| <b>April</b>        |                          |               |                    |                                     |
| Darfield            | 28.9                     | 1939          | 2 April            | Highest for April                   |
| Kaikoura            | 27.5                     | 1964          | 2 April            | 3 <sup>rd</sup> highest for April   |
| <b>May</b>          |                          |               |                    |                                     |
| Whangarei Airport   | 24.8                     | 1968          | 2 May              | Highest for May                     |
| Whitianga Airport   | 22.7                     | 1991          | 2 May              | Highest for May                     |
| Hamilton Airport    | 22.4                     | 1971          | 2 May              | Highest for May                     |
| Napier Airport      | 26.0                     | 1974          | 2 May              | Highest for May                     |
| Napier, Nelson Park | 27.3                     | 1923          | 2 May              | Highest for May                     |
| Takaka, Kotinga     | 23.9                     | 1986          | 2 May              | Highest for May                     |
| Franz Josef         | 21.5                     | 1983          | 12 May             | Equal highest for May               |
| <b>October</b>      |                          |               |                    |                                     |
| Napier, Nelson Park | 29.0                     | 1868          | 29 <sup>th</sup>   | 3 <sup>rd</sup> highest             |
| Takaka              | 27.9                     | 1986          | 14 <sup>th</sup>   | Highest                             |
| Motueka, Riwaka     | 26.7                     | 1956          | 14 <sup>th</sup>   | 2 <sup>nd</sup> highest             |
| Nelson Airport      | 25.2                     | 1943          | 14 <sup>th</sup>   | 2 <sup>nd</sup> highest             |
| Blenheim Research   | 26.5                     | 1985          | 14 <sup>th</sup>   | Highest                             |
| Awatere Valley      | 28.2                     | 2001          | 14 <sup>th</sup>   | Highest                             |
| <b>November</b>     |                          |               |                    |                                     |
| Culverden           | 30.0                     | 1983          | 7 <sup>th</sup>    | Highest                             |

Unusually high mean daily maximum temperatures were recorded at:

| Location        | Mean daily maximum temperature | Departure (°C) | Records began | Comments |
|-----------------|--------------------------------|----------------|---------------|----------|
| <b>January</b>  |                                |                |               |          |
| East Taratahi   | 26.6                           | +2.8           | 1973          | Highest  |
| Dunedin Airport | 23.6                           | +2.9           | 1963          | Highest  |

Unusually high mean monthly temperatures were recorded at:

| Location             | Mean temperature | Departure (°C) | Records began | Comments                      |
|----------------------|------------------|----------------|---------------|-------------------------------|
| <b>January</b>       |                  |                |               |                               |
| Chateau, Ruapehu     | 14.4             | +1.9           | 1930          | 2 <sup>nd</sup> highest       |
| Motueka              | 19.0             | +1.5           | 1957          | 2 <sup>nd</sup> equal highest |
| Nelson Airport       | 19.2             | +1.6           | 1944          | 2 <sup>nd</sup> equal highest |
| Blenheim Airport     | 19.8             | +1.9           | 1941          | 2 <sup>nd</sup> equal highest |
| Dunedin Airport      | 16.7             | +1.7           | 1963          | 2 <sup>nd</sup> equal highest |
| <b>February</b>      |                  |                |               |                               |
| Raoul Island         | 24.6             | +1.9           | 1941          | Highest                       |
| <b>May</b>           |                  |                |               |                               |
| Motu                 | 10.5             | +1.8           | 1991          | Highest                       |
| Farewell Spit        | 13.7             | +1.6           | 1971          | Equal highest                 |
| <b>June</b>          |                  |                |               |                               |
| Hanmer Forest        | 7.3              | +2.6           | 1906          | 3 <sup>rd</sup> equal highest |
| Kaikoura             | 10.9             | +2.1           | 1964          | 2 <sup>nd</sup> highest       |
| Winchmore            | 7.8              | +1.8           | 1950          | 3 <sup>rd</sup> equal highest |
| Rangiora             | 8.5              | +2.2           | 1965          | Highest                       |
| Christchurch Airport | 8.1              | +1.9           | 1954          | Highest                       |
| Lincoln              | 8.6              | +2.1           | 1881          | 3 <sup>rd</sup> highest       |
| Tara Hills           | 4.8              | +2.2           | 1950          | 3 <sup>rd</sup> highest       |
| <b>November</b>      |                  |                |               |                               |
| Dunedin Airport      | 13.6             | +1.5           | 1963          | Highest                       |
| Gore                 | 12.8             | +1.1           | 1972          | Equal highest                 |
| Invercargill Airport | 12.8             | +1.5           | 1948          | 2 <sup>nd</sup> highest       |

## LOW TEMPERATURES AND SEVERE FROST

There were a number of periods during the year with usually low temperatures and/or severe frosts.

- **Annual minima**

The lowest temperature for the year was -12.0°C, recorded at Fairlie on 16 August.

- **Unusually frosty July**

Near or record high numbers of days with screen frost were recorded in July at:

| Location             | Days with screen frost | Departure from normal | Year Records began | Comments |
|----------------------|------------------------|-----------------------|--------------------|----------|
| Christchurch Airport | 23                     | +10                   | 1954               | Highest  |
| Dunedin Airport      | 26                     | +10                   | 1963               | Highest  |

- **22-30 August – Extended cold period**

Cold southerlies affected New Zealand. Kelburn in Wellington recorded 7 consecutive days from 23-29 August with maximum temperatures of 9.0°C or less, making it the longest cold spell there since July 1981. Ground frosts of about -6°C occurred in parts of Northland, Waikato and the Bay of Plenty on the 29<sup>th</sup> and 30<sup>th</sup>.



- **28 November – Damaging frost**

Frosts occurred in parts of Taranaki on the 27<sup>th</sup>, severely damaging blueberry crops.

- **December – very unseasonable – 5<sup>th</sup> coldest on record**

December was the fifth coldest on record overall since reliable temperature measurements were established in 1853, and the coldest since 1945. The national average of 13.4°C was 2.2°C below normal, lower only in 1902 (12.9° C), 1911 (13.0 °C), 1914 (13.2°C), and 1945 (13.3°C). The December 2004 temperatures were equivalent to mid spring temperatures, rather than those of an early summer month. Record-breaking low mean December temperatures occurred in many places, being up to 4°C below average in inland parts of Canterbury, Otago, and Southland. The cold weather slowed the growth and ripening of berries, stone fruit, and many horticultural crops. Ground frost occurred on the 12<sup>th</sup> of December in inland sheltered areas of the North Island, including Hawke’s Bay, and Manawatu Island, and on several days during the month in many locations in the South Island. Tekapo recorded 10 days with ground frost (about twice average).

Extremes of grass minimum temperature were recorded at:

| Location            | Minimum air temperature (°C) | Records began | Date of occurrence | Comments |
|---------------------|------------------------------|---------------|--------------------|----------|
| <b>August</b>       |                              |               |                    |          |
| Warkworth           | -6.3                         | 1972          | 29 <sup>th</sup>   | Lowest   |
| Auckland, Henderson | -6.3                         | 1986          | 29 <sup>th</sup>   | Lowest   |

Extremes of minimum temperature were recorded at:

| Location          | Minimum air temperature (°C) | Records began | Date of occurrence | Comments                     |
|-------------------|------------------------------|---------------|--------------------|------------------------------|
| <b>March</b>      |                              |               |                    |                              |
| Fairlie           | -4.0                         | 1925          | 25 <sup>th</sup>   | Lowest                       |
| <b>April</b>      |                              |               |                    |                              |
| Fairlie           | -8.0                         | 1925          | 22 <sup>nd</sup>   | 2 <sup>nd</sup> lowest       |
| <b>August</b>     |                              |               |                    |                              |
| Fairlie           | -12.0                        | 1925          | 16 <sup>th</sup>   | 3 <sup>rd</sup> lowest       |
| Westport Airport  | -1.5                         | 1937          | 17 <sup>th</sup>   | Lowest                       |
| Hokitika Airport  | -2.9                         | 1964          | 17 <sup>th</sup>   | Lowest                       |
| Blenheim Airport  | -5.8                         | 1941          | 24 <sup>th</sup>   | Lowest                       |
| Kaikohe           | 1.4                          | 1973          | 29 <sup>th</sup>   | 3 <sup>rd</sup> lowest       |
| Manapouri Airport | -6.5                         | 1992          | 29 <sup>th</sup>   | 2 <sup>nd</sup> lowest       |
| <b>October</b>    |                              |               |                    |                              |
| Waiouru           | -5.7                         | 1966          | 3 <sup>rd</sup>    | 3 <sup>rd</sup> lowest       |
| Hanmer forest     | -5.0                         | 1906          | 3 <sup>rd</sup>    | 3 <sup>rd</sup> equal lowest |

Unusually low mean monthly temperatures were recorded at:

| Location             | Mean temperature | Departure (°C) | Records began | Comments                     |
|----------------------|------------------|----------------|---------------|------------------------------|
| <b>February</b>      |                  |                |               |                              |
| Wanaka Airport       | 13.9             | -3.3           | 1993          | Lowest                       |
| Dunedin, Musselburgh | 13.5             | -1.7           | 1947          | 2 <sup>nd</sup> lowest       |
| Queenstown Airport   | 12.9             | -2.5           | 1969          | Lowest                       |
| Lauder               | 13.3             | -2.6           | 1982          | Lowest                       |
| Clyde                | 13.8             | -2.9           | 1984          | Lowest                       |
| Tiwai Point          | 12.4             | -2.1           | 1971          | Lowest                       |
| <b>March</b>         |                  |                |               |                              |
| Cape Reinga          | 17.2             | -1.9           | 1952          | 3 <sup>rd</sup> lowest       |
| Kaitaia Observatory  | 16.7             | -2.5           | 1986          | Lowest                       |
| Kaikohe              | 16.0             | -1.9           | 1973          | Lowest                       |
| Dargaville           | 16.6             | -1.8           | 1944          | 2 <sup>nd</sup> equal lowest |
| Whangarei Airport    | 17.1             | -1.8           | 1968          | Lowest                       |

|                       |      |      |      |                              |
|-----------------------|------|------|------|------------------------------|
| Mokohinau Is.         | 17.6 | -2.5 | 1973 | Lowest                       |
| Warkworth             | 15.3 | -2.5 | 1973 | Lowest                       |
| Henderson, Auckland   | 16.3 | -2.0 | 1986 | Lowest                       |
| Auckland Airport      | 16.8 | -1.7 | 1963 | Lowest                       |
| Pukekohe              | 15.2 | -2.6 | 1971 | Lowest                       |
| Paeroa                | 15.7 | -2.3 | 1947 | Equal lowest                 |
| Rotorua Airport       | 13.9 | -2.2 | 1964 | Lowest                       |
| Hamilton Airport      | 14.8 | -2.1 | 1971 | 2 <sup>nd</sup> lowest       |
| Te Puke               | 15.6 | -1.6 | 1973 | Lowest                       |
| Taumarunui            | 14.0 | -2.4 | 1948 | Lowest                       |
| New Plymouth Airport  | 14.4 | -2.3 | 1944 | Lowest                       |
| Turangi               | 12.6 | -2.6 | 1968 | Lowest                       |
| Castlepoint           | 15.0 | -2.1 | 1972 | 2 <sup>nd</sup> equal lowest |
| Whakatu               | 14.1 | -2.5 | 1983 | Lowest                       |
| Wellington Airport    | 15.0 | -1.6 | 1962 | 2 <sup>nd</sup> lowest       |
| <b>April</b>          |      |      |      |                              |
| Warkworth             | 13.9 | -1.6 | 1972 | 2 <sup>nd</sup> equal lowest |
| Pukekohe              | 13.8 | -1.7 | 1971 | 3 <sup>rd</sup> lowest       |
| Turangi               | 10.7 | -1.6 | 1968 | 3 <sup>rd</sup> lowest       |
| Castlepoint           | 12.6 | -2.5 | 1972 | 2 <sup>nd</sup> lowest       |
| Paraparaumu Airport   | 12.1 | -1.6 | 1953 | 3 <sup>rd</sup> lowest       |
| Wellington Airport    | 12.6 | -1.9 | 1962 | 2 <sup>nd</sup> lowest       |
| Hokitika Airport      | 11.2 | -1.3 | 1964 | 3 <sup>rd</sup> equal lowest |
| Blenheim Airport      | 11.7 | -1.4 | 1941 | 2 <sup>nd</sup> equal lowest |
| Timaru Airport        | 9.2  | -1.9 | 1962 | Lowest                       |
| Tiwai Point           | 9.6  | -1.6 | 1971 | Lowest                       |
| <b>July</b>           |      |      |      |                              |
| Castlepoint           | 8.6  | -1.5 | 1972 | 3 <sup>rd</sup> lowest       |
| Whakatu               | 6.1  | -2.4 | 1983 | Lowest                       |
| Dunedin Airport       | 3.6  | -1.5 | 1963 | 3 <sup>rd</sup> equal lowest |
| <b>August</b>         |      |      |      |                              |
| Castlepoint           | 8.5  | -1.8 | 1972 | Lowest                       |
| Westport Airport      | 7.9  | -1.4 | 1937 | 3 <sup>rd</sup> equal lowest |
| Puysegur Point        | 7.1  | -1.2 | 1980 | 2 <sup>nd</sup> lowest       |
| Dunedin, Musselburgh  | 6.2  | -1.4 | 1947 | 3 <sup>rd</sup> equal lowest |
| Manapouri Airport     | 2.9  | -1.9 | 1992 | Lowest                       |
| Queenstown Airport    | 3.2  | -1.6 | 1969 | 3 <sup>rd</sup> equal lowest |
| Clyde                 | 3.5  | -1.8 | 1983 | Lowest                       |
| Invercargill Airport  | 4.9  | -1.5 | 1948 | 3 <sup>rd</sup> lowest       |
| Tiwai Point           | 5.3  | -1.9 | 1970 | Lowest                       |
| <b>December</b>       |      |      |      |                              |
| Cape Reinga AWS       | 15.5 | -1.9 | 1951 | 2 <sup>nd</sup> lowest       |
| Kaitaia Observatory   | 15.9 | -1.8 | 1985 | Lowest                       |
| Kerikeri EWS          | 16.1 | -1.6 | 1981 | Lowest                       |
| Kaikohe               | 15.2 | -1.9 | 1973 | Lowest                       |
| Whangarei Airport     | 16.7 | -1.6 | 1967 | 2 <sup>nd</sup> lowest       |
| Mokohinau             | 16.1 | -2.0 | 1972 | Lowest                       |
| Henderson, River Park | 16.0 | -2.2 | 1985 | Lowest                       |
| Auckland, Owairaka    | 15.4 | -2.4 | 1949 | Lowest                       |
| Paeroa                | 15.3 | -2.8 | 1947 | Lowest                       |
| Whakatane Airport     | 15.1 | -1.9 | 1974 | Lowest                       |
| Rotorua Airport       | 13.5 | -2.7 | 1964 | Lowest                       |
| Taupo Airport         | 13.3 | -2.3 | 1976 | Lowest                       |
| Auckland, Mangere     | 15.6 | -2.6 | 1959 | Lowest                       |
| Auckland Airport      | 16.0 | -2.2 | 1962 | Lowest                       |
| Hamilton Airport      | 14.5 | -1.9 | 1970 | Lowest                       |
| Taumarunui            | 13.6 | -3.1 | 1947 | Lowest                       |
| Turangi               | 13.0 | -2.7 | 1968 | Lowest                       |
| Castlepoint           | 13.8 | -2.9 | 1972 | Lowest                       |
| East Taratahi         | 14.1 | -1.1 | 1972 | 2 <sup>nd</sup> lowest       |
| Hicks Bay             | 15.3 | -2.0 | 1990 | Lowest                       |
| Napier Airport        | 16.0 | -1.5 | 1973 | 3 <sup>rd</sup> lowest       |
| Mahia                 | 15.4 | -1.7 | 1990 | 2 <sup>nd</sup> lowest       |

|                          |      |      |      |                              |
|--------------------------|------|------|------|------------------------------|
| Palmerston North Airport | 14.3 | -1.7 | 1962 | 2 <sup>nd</sup> lowest       |
| Wellington Airport       | 15.0 | -1.4 | 1962 | 2 <sup>nd</sup> lowest       |
| Wallaceville             | 13.9 | -1.7 | 1939 | 3 <sup>rd</sup> equal lowest |
| Stratford                | 12.8 | -1.5 | 1960 | 2 <sup>nd</sup> lowest       |
| Takaka                   | 14.2 | -1.6 | 1985 | Lowest                       |
| Westport Airport         | 12.6 | -2.4 | 1937 | 3 <sup>rd</sup> lowest       |
| Hokitika Airport         | 12.2 | -2.2 | 1963 | Lowest                       |
| Milford Sound            | 11.2 | -2.2 | 1934 | Equal lowest                 |
| Puyssegur Point          | 10.2 | -2.3 | 1978 | Lowest                       |
| Motueka, Riwaka          | 14.1 | -2.0 | 1956 | Lowest                       |
| Blenheim Research        | 14.6 | -2.1 | 1985 | Equal lowest                 |
| Blenheim Airport         | 14.5 | -1.8 | 1941 | 2 <sup>nd</sup> equal lowest |
| Hanmer Forest            | 11.6 | -2.7 | 1906 | 2 <sup>nd</sup> lowest       |
| Kaikoura                 | 13.1 | -2.3 | 1963 | Lowest                       |
| Mt Cook Village          | 9.1  | -3.7 | 1929 | 2 <sup>nd</sup> lowest       |
| Winchmore                | 11.4 | -3.5 | 1949 | Lowest                       |
| Rangiora                 | 12.3 | -3.1 | 1999 | Lowest                       |
| Christchurch Airport     | 13.0 | -2.8 | 1953 | Lowest                       |
| Christchurch Gardens     | 13.3 | -2.8 | 1863 | Equal lowest                 |
| Lincoln, Broadfield      | 12.5 | -2.8 | 1881 | 2 <sup>nd</sup> equal lowest |
| Lake Tekapo              | 9.5  | -3.8 | 1927 | 2 <sup>nd</sup> lowest       |
| Timaru Airport           | 11.8 | -2.7 | 1962 | Lowest                       |
| Wanaka Airport           | 12.2 | -3.6 | 1992 | Lowest                       |
| Dunedin Airport          | 11.5 | -2.4 | 1962 | Lowest                       |
| Dunedin, Musselburgh     | 11.0 | -2.9 | 1947 | Lowest                       |
| Manapouri Airport        | 10.0 | -3.0 | 1991 | Lowest                       |
| Queenstown Airport       | 10.8 | -3.5 | 1968 | Lowest                       |
| Lauder                   | 11.0 | -3.4 | 1981 | Lowest                       |
| Clyde                    | 11.8 | -4.0 | 1983 | Lowest                       |
| Ettrick                  | 11.4 | -4.1 | 1986 | Lowest                       |
| Gore                     | 10.0 | -3.5 | 1971 | Lowest                       |
| Invercargill Airport     | 10.5 | -2.5 | 1948 | Lowest                       |
| Tiwai Point              | 10.9 | -2.5 | 1970 | Lowest                       |
| Chatham Islands          | 11.9 | -1.8 | 1956 | Equal lowest                 |

Near or record low mean daily minimum temperatures were recorded at:

| Location             | Mean daily minimum air temperature (°C) | Departure from average (°C) | Records Began | Comments |
|----------------------|---|-----------------------------|---------------|----------|
| <b>July</b>          |   |                             |               |          |
| Christchurch Airport | -1.6                                    | -2.4                        | 1954          | Lowest   |
| Timaru Airport       | -2.8                                    | -2.6                        | 1967          | Lowest   |
| Dunedin Airport      | -3.3                                    | -3.3                        | 1963          | Lowest   |

## 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 2004 were:

| Location             | Sunshine (hours) | Percentage of normal | Year Records began | Comments               |
|----------------------|------------------|----------------------|--------------------|------------------------|
| <b>February</b>      |                  |                      |                    |                        |
| Ruakura              | 122              | 62                   | 1937               | Lowest                 |
| Taumarunui           | 111              | 61                   | 1948               | Lowest                 |
| New Plymouth Airport | 133              | 65                   | 1916               | 2 <sup>nd</sup> lowest |
| Turangi              | 119              | 61                   | 1977               | Lowest                 |
| Martinborough        | 120              | 61                   | 1987               | Lowest                 |

|                      |                              |     |      |                               |
|----------------------|------------------------------|-----|------|-------------------------------|
| Paraparaumu          | 127                          | 61  | 1953 | Lowest                        |
| Palmerston North     | 106                          | 56  | 1930 | Lowest                        |
| Wellington, Kelburn  | 145                          | 69  | 1928 | 2 <sup>nd</sup> lowest        |
| Stratford            | 133                          | 64  | 1963 | Lowest                        |
| Blenheim Research    | 173                          | 75  | 1986 | Lowest                        |
| <b>March</b>         |                              |     |      |                               |
| Stratford            | 230                          | 131 | 1963 | 3 <sup>rd</sup> highest       |
| Nelson Airport       | 263                          | 124 | 1949 | 3 <sup>rd</sup> highest       |
| <b>May</b>           |                              |     |      |                               |
| Motueka, Riwaka      | 131                          | 79  | 1965 | 2 <sup>nd</sup> lowest        |
| Blenheim Research    | 130                          | 77  | 1986 | Lowest                        |
| Mt. Cook Village     | 47                           | 53  | 1930 | Lowest                        |
| <b>July</b>          |                              |     |      |                               |
| Dargaville           | 153                          | 138 | 1943 | Highest                       |
| Hamilton, Ruakura    | 161                          | 134 | 1936 | 2 <sup>nd</sup> equal highest |
| Mt Cook Village      | 109                          | 144 | 1930 | Equal highest                 |
| Lake Tekapo          | 200                          | 184 | 1928 | Highest                       |
| Dunedin, Musselburgh | 145                          | 143 | 1948 | 2 <sup>nd</sup> highest       |
| <b>August</b>        |                              |     |      |                               |
| Dargaville           | 170                          | 126 | 1943 | 2 <sup>nd</sup> highest       |
| Auckland, Mangere    | 194                          | 136 | 1963 | Highest                       |
| New Plymouth Airport | 191                          | 124 | 1973 | 2 <sup>nd</sup> highest       |
| <b>October</b>       |                              |     |      |                               |
| Dunedin, Musselburgh | 203                          | 138 | 1948 | Highest                       |
| Dargaville           | 127                          | 76  | 1943 | 2 <sup>nd</sup> lowest        |
| Stratford            | 135                          | 79  | 1963 | 2 <sup>nd</sup> lowest        |
| Palmerston North     | 93                           | 63  | 1930 | Lowest                        |
| Paraparaumu Airport  | 125                          | 71  | 1953 | 3 <sup>rd</sup> lowest        |
| <b>November</b>      |                              |     |      |                               |
| Auckland, Mangere    | 238                          | 124 | 1963 | Highest                       |
| <b>December</b>      |                              |     |      |                               |
| Kaitaia              | 169 <sup>1-day missing</sup> | 77  | 1985 | 2 <sup>nd</sup> Lowest        |
| Auckland, Mangere    | 174                          | 83  | 1963 | 3 <sup>rd</sup> lowest        |
| Taumarunui           | 130                          | 71  | 1947 | 3 <sup>rd</sup> lowest        |

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**ENDS**