

National Climate Summary – Winter 2011: Dry and sunny, with a snowy finish.

- **Precipitation: Overall, it was a relatively dry winter for many regions. But two extreme polar outbreaks produced snow falls in unusual locations.**
- **Sunshine: A sunny winter for most regions.**
- **Temperatures: A very warm winter in the north and east of the North Island, as well as Central Otago and the Lakes District.**

Winter arrived late this year – June was exceptionally warm (the 3rd warmest on record), being characterised by frequent northeasterly winds. Temperatures remained elevated through a stormy, unsettled and extremely windy (westerly) July, until a polar blast on 24-26 July delivered a bitterly cold air mass over the country. Extremely cold air affected Canterbury, the Kaikoura coast, Nelson, Wellington, Wairarapa, Manawatu, Hawkes Bay and Taranaki during 25-26 July, and snowfall was heavy and to low levels over Canterbury, the Kaikoura Ranges (both Inland and Seaward), the Richmond Ranges, Tararua and Rimutaka Ranges, the Central Plateau, and around Mt Egmont. Brief dustings of snow were also reported in the ranges of Motueka and Northland on 25 July. August continued with more of the same – a second polar outbreak affected New Zealand on 14-17 August, bringing heavy snow to unusually low levels across eastern and alpine areas of the South Island, as well as Wellington. Snow also fell across the lower North Island, with flurries in unusual locations further north. The long-lived southerly winds between 14 and 17 August again delivered extremely cold air over the country, with numerous low temperature records broken over this period. However, the last week of August was rather sunny, with some unusually ‘spring-like’ temperatures.

Overall, winter 2011 was characterised by more southwest winds than usual over New Zealand, with highs over the Tasman Sea and lows to the southeast of the country. It was generally a sunny and rather dry winter, and was much warmer than usual in the north and east of the North Island, as well as Central Otago and the Lakes District. Sunshine totals were above normal for many regions, excluding Auckland, the southwest of the North Island, the northwest of the South Island including Hokitika, as well as Southland (where near normal winter sunshine was observed). It was the sunniest winter on record for Taumarunui and Lake Tekapo.

Rainfall was less than half of winter normal for south Canterbury and parts of Otago. For the remainder of the South Island, as well as eastern parts of Northland and north Auckland, rainfall was generally below normal (between 50 and 79 percent of winter normal). It was the driest winter on record for Alexandra and also Leigh (north Auckland). In contrast, coastal Southland experienced above normal winter rains. Elsewhere in the North Island, as well as for the greater Nelson region, winter rainfall was near normal.

Winter mean temperatures were well above average (more than 1.2°C above winter average) across much of the north and east of the North Island, as well as Central Otago and the Lakes District. Below average temperatures (more than 0.5 C below winter average) were observed in inland north Otago, and in parts of the northwest South Island. Elsewhere, winter temperatures were near average. The average temperature for winter 2011 was 8.7°C (0.4°C above the 1971–2000 winter average) using NIWA’s seven-station temperature series which begins in 1909.

Further Highlights:

- The highest winter temperature recorded was 22.4°C at Whitianga on 5 June (a new winter record at this location).
- The lowest temperature recorded was -10.2°C at Manapouri on 26 July (a new all-time record at this location).
- The highest 1-day rainfall experienced was 128 mm recorded at Arthurs Pass on 10 July.
- The highest gust was 189 km/hr observed at Cape Turnagain on 12 July.
- Of the six main centres in winter 2011, Auckland was the warmest, Christchurch the coldest, Hamilton the wettest, Dunedin the driest, and Tauranga the sunniest.

For further information, please contact:

**Ms Georgina Griffiths – Climate Scientist– NIWA National Climate Centre, Auckland,
Tel. (09) 375 4506 (office) or (027) 293 6545 (mobile)**

PRECIPITATION: TWO EXTREME POLAR OUTBREAKS PRODUCED HEAVY SNOWFALLS AND SNOW IN UNUSUAL LOCATIONS. BUT OVERALL, IT WAS A RELATIVELY DRY WINTER FOR MANY REGIONS.

A polar blast on 24-26 July delivered a bitterly cold air mass over the country. Snowfall was heavy and to low levels over Canterbury, the Kaikoura Ranges (both Inland and Seaward), the Richmond Ranges, Tararua and Rimutaka Ranges, the Central Plateau, and around Mt Egmont. Brief dustings of snow were also reported in the ranges of Motueka and Northland on 25 July. August continued with more of the same – a second polar outbreak affected New Zealand on 14-17 August, bringing heavy snow to unusually low levels across eastern and alpine areas of the South Island, as well as Wellington. Snow also fell across the lower North Island, with flurries in unusual locations further north.

Overall, however, the winter was relatively dry, particularly for the South Island. Winter rainfall was well below normal (less than 50 percent of winter normal) for south Canterbury and parts of Otago. For the remainder of the South Island, as well as eastern parts of Northland and north Auckland, rainfall was generally below normal (between 50 and 79 percent of winter normal). It was the driest winter on record for Alexandra and also Leigh (north Auckland). In contrast, coastal Southland experienced above normal winter rains (between 120 and 149 percent of winter normal). Elsewhere in the North Island, as well as for the greater Nelson region, winter rainfall was near normal (between 80 and 119 percent of normal).

Record or near-record winter rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
Wanganui	341	142	1987	3rd highest
Tiwai Point	371	145	1970	2nd-highest
Kerikeri	403	76	1981	4th-lowest
Leigh	201	52	1966	Lowest
Hokitika	465	68	1963	3rd-lowest
Greymouth	397	65	1947	4th-lowest
Timaru	48	36	1990	4th-lowest
Dunedin	84	41	1918	3rd-lowest
Lumsden	142	70	1982	2nd-lowest
Alexandra	30	39	1983	Lowest

SUNSHINE: A SUNNY WINTER FOR MANY REGIONS. SUNNIEST ON RECORD FOR TAUMARUNUI AND LAKE TEKAPO.

Sunshine totals were above normal (more than 110 percent of winter normal) across many regions of the country, excluding Auckland, the southwestern North Island (Taranaki, Wanganui-Manawatu, Kapiti Coast, Wellington), the northwest of the South Island including Hokitika, as well as Southland. In these regions, near normal winter sunshine was generally observed (between 90 and 110 percent of winter normal sunshine). It was the sunniest winter for Taumaranui since records began there in 1947, and for Lake Tekapo since observations started in 1928.

Record or near-record winter sunshine hours were recorded at:

Location	Sunshine (hours)	Percentage Of normal	Year records began	Comments
Te Kuiti	374	124	1962	2nd-highest
Taumaranui	349	132	1947	Highest
Waipawa	455	121	1945	3rd-highest
Takaka	496	109	1985	4th-highest
Blenheim	539	111	1947	2nd-highest
Lake Tekapo	512	147	1928	Highest
Balclutha	382	131	1964	4th-highest

TEMPERATURE: WELL ABOVE AVERAGE IN THE NORTH AND EAST OF THE NORTH ISLAND, AS WELL AS FOR CENTRAL OTAGO AND THE LAKES DISTRICT. BELOW AVERAGE FOR INLAND NORTH OTAGO, AND SMALL AREAS OF THE NORTHWEST SOUTH ISLAND. NEAR AVERAGE ELSEWHERE.

Winter mean temperatures were well above average (more than 1.2°C above winter average) across much of the north and east of the North Island (namely parts of Northland, Auckland, Waikato, Bay of Plenty, parts of Gisborne and Hawkes Bay), as well as Central Otago and the Lakes District. Below average temperatures (more than 0.5 C below winter average) were observed in inland north Otago, and in parts of the northwest South Island. Elsewhere, winter temperatures were near average (within 0.5 C of winter average). The average temperature for winter 2011 was 8.7°C (0.4°C above the 1971–2000 winter average) using NIWA’s seven-station temperature series which begins in 1909¹.

Record or near-record winter mean maximum air temperatures were recorded at:

Location	Mean maximum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Kaikohe	15.6	1.5	1973	2nd-highest
Leigh	16.9	1.6	1966	2nd-highest
Tauranga	15.8	1.1	1913	4th-highest
Lake Rotoiti	10.0	1.1	1965	3rd-highest
Motueka	14.5	1.4	1956	3rd-highest
Mt Cook	9.4	2.0	1929	3rd-highest
Timaru	12.2	1.1	1990	2nd-highest
Dunedin	11.4	1.0	1947	3rd-highest

Record or near-record winter mean minimum air temperatures were recorded at:

Location	Mean minimum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Dargaville	9.3	1.8	1943	4th-highest

¹ Interim seasonal value.

WINTER CLIMATE IN THE SIX MAIN CENTRES

Of the six main centres in winter 2011, Auckland was the warmest, Christchurch the coldest, Hamilton the wettest, Dunedin the driest, and Tauranga the sunniest. The Dunedin rainfall was notably low for winter, bring the 3rd-lowest winter total since records began at Musselburgh in 1918.

Winter 2011 main centre climate statistics:

Location	Mean temp. (°C)	Departure from normal (°C)		Rainfall (mm)	% of normal		Sunshine (hours)	% of normal	
Auckland ^a	12.1	+0.8	Above average	310	81%	Near normal	393	109%	Near normal
Tauranga ^b	11.4	+1.2	Well above average	327	89%	Near normal	450	101%	Near normal
Hamilton ^c	9.6	+0.7	Above average	372	104%	Near normal	393 ^g	109%	Near normal
Wellington ^d	9.4	+0.3	Near average	356	88%	Near normal	323	92%	Near normal
Christchurch ^e	6.6	+0.2	Near average	133	67%	Below normal	409	105%	Near normal
Dunedin ^f	7.6	+0.6	Above average	84	41%	3 rd lowest for winter	386	128%	Well above normal

^a Mangere ^b Tauranga Airport ^c Hamilton Airport ^d Kelburn ^e Christchurch Airport ^f Musselburgh ^g Ruakura

HIGHLIGHTS AND EXTREME EVENTS

• Snow and ice

A lack of snow caused the cancellation of some of the events planned for the first week of the Queenstown Winter Festival, in late June.

In contrast, on 7 July, snow closed both SH8, Omarama to Tarras, the Lindis Pass, and SH94, Te Anau to Milford Sound. Some vehicles had to be towed off the Lindis Pass. Chains were required on the Crown Range between Queenstown and Wanaka. SH94 remained closed on 8 July, and chains were required on SH73 between Arthurs Pass and Otira, on SH6 at the Haast Pass. Warnings were in place for SH85, Palmerston to Kyeburn, and SH8, the Lindis Pass.

On 9 July, snow closed the Crown Range until it was cleared by snow ploughs at 1 pm on the 10th. The snow and ice-covered Haast and Lindis Passes were also closed overnight. Heavy snow prevented both Wanaka ski fields, and the Remarkables, from opening on 10 July. Several flights in and out of Queenstown Airport were cancelled. Snow also closed SH94, the Milford Road, between Knobs Flat and Milford Sound, with other parts of the road closed to towing vehicles.

SH94 remained closed from Knobs Flat to Milford Sound on July 11th, with chains essential on SH73 at Porters Pass and at Arthurs Pass to Otira, SH8 at Lindis Pass, and SH6 at Haast Pass. Ice warnings were in force for SH6 from Kingston to Five Rivers. Ironically, ski fields were also closed because of too much snow, the danger of avalanche, and the difficult driving conditions. Many schools in Central Otago were closed for the day. A Saudi Arabian family was freed early afternoon after they spent the night trapped in their campervan on the snow-bound Crown Range pass.

On 12 July, the snow caused havoc in Queenstown with schools closed, vehicles trapped, and the road from Queenstown to Frankton closed. Two flights were cancelled, one diverted, and others delayed. Trucks were stuck in snow on SH8 between Roxburgh and Shingle Creek, with traffic diverted along SH85, the Pigroot. The Crown Range and Lindis Pass were closed, as was SH82 between Te Anau and Milford Sound. SH94 remained closed. Snow-loading on power lines was also responsible for power trips, or brief cuts, in the Gore area.

On 13 July, heavy snow brought down trees and power lines in Tasman District, closing roads, and cutting power to about 500 homes. Chains were essential on SH63 from Wairau to Kawatiri, while snow closed SH6 at the Hope Saddle and Spooner Range, stranding trucks and campervans. Snow-loading caused trees to fall across SH6 in the Motupiko area. Lake Rotoiti School at St Arnaud was closed for a second day. Rainbow Skifield, the Mt Robert Road, Tophouse Road to St Arnaud, and all local or back roads south of Wakefield were also closed. Heavy snow loading on lines and trees brought down power lines and disrupted supply to about 500 customers in St Arnaud, the Howard Valley, the Buller River Valley, the Gowan Valley, and parts of Rainy River. Further south, snow closed the Crown Range Road again, SH93 from Clinton to Matura, and SH94 between Milford Sound and Te Anau remained closed. Black ice warnings were issued for SH6, between Winton and Centre Bush, and for SH8, the Lindis Pass, from Tarras to Omarama. Chains were essential for SH6 at the Haast Pass.

SH94 remained closed by snow on 14 July, with severe gales hampering efforts to clear it. SH93 from Clinton to Matura was also closed. Clinton Primary School closed at lunchtime. Chains were essential on SH73 between Arthur's Pass and Otira, and SH8 between Omarama and Tarras, the Lindis Pass, with both roads closed to towing vehicles. The Crown Range was re-opened but chains were essential. Snow was reported in Invercargill, the Tokanui school in The Catlins was closed, and doctors from Balclutha were not able to get through to Tokanui for a planned clinic. On 15 July, ice closed SH87 between Outram and Middlemarch, with cautions in place for black ice on SH8 from Lawrence to Raes Junction, SH94 from Mossburn to Te Anau, SH1 from Clinton to Gore, and from Balclutha to Gore.

On 24 July, snow closed SH1 on the Desert Road section, SH2 at the Rimutaka Hill Road, and SH5 between Napier and Taupo in the North Island. In the South Island, SH8 from Lawrence to Milton was closed by snow, and chains were required on SH96 and SH85 from Ranfurly to Naseby. Towing restrictions were in place, and chains had to be carried on SH94 between Mossburn and Te Anau or Milford Sound, SH6 between Five Rivers and Dipton, and SH93 between Clinton and Matura. Queenstown Airport was closed. In Invercargill, children from Ohai-Otautau could not get to the ILT Kidzone Festival, while attendees from Te Anau were an hour late after chains had to be fitted.

On 25 July, snow closed SH1 from Cheviot to Waipara, Oamaru to Dunedin and Dunedin to Gore, SH6 from Queenstown to Kingston, SH75 from Little River to Barrys Bay, SH5 at Rangitaiki, SH87 Outram to Middlemarch; SH85 Palmerston to Kyeburn, SH8 Raes Junction to Clarkesville, SH93 from Clinton to Matura, SH35 at Waipiro, and SH94 Te Anau to Milford Sound. The Rimutaka Hill Road, the Desert Road, and the Napier-Taupo Road remained closed, and SH2 at both Nuhaka and Mt Bruce between Masterton and Eketahuna, and the Napier-Taihape Road were added to the list. Both Lincoln and Canterbury Universities, and Canterbury Polytechnic Institute of Technology were closed for the day. In Dunedin, Otago Polytechnic closed at 10.30am, many banks and retail businesses did not open, and meals-on-wheels deliveries were cancelled by the District Health Board. Christchurch, Dunedin, Queenstown and Invercargill airports were closed. Snow on the power lines caused power cuts across Canterbury. Elective surgery was cancelled at both Christchurch and Southland Hospitals. Snow was down to sea level at New Brighton and Spencerville beaches. City bus services in Christchurch, Waimakariri and Selwyn districts were cancelled, as were many long distance bus services, and many businesses, including banks, were closed for the day as staff were unable to get into the city. Courier and rural post deliveries were cancelled, and in Balclutha and Queenstown, the day's court proceedings were postponed. More than 200 stranded motorists sheltered in the Waitati Hall overnight. Severe ice on SH6 from south of Lumsden to Kingston caused several accidents. Snow was also reported from the Kaimai Ranges, Taupo, Hawera, Stratford, Wanganui, Palmerston North, the Kapiti Coast, Wellington, Masterton, Greytown, Martinborough, Greymouth, Hokitika, Nelson, Mapua, Motueka, Takaka Hill, Rai Saddle and Kaikoura. In Taranaki, newborn calves had to be rescued from the storm and put indoors, and power was cut to about 1800 properties around Kaponga and Cardiff.

On 26 July, SH85 from Palmerston to Kyeburn, SH87 from Outram to Middlemarch, SH2 at the Rimutaka Hill Road, SH1, the Desert Road south to Taihape, and SH4 remained closed by snow and ice. Early morning flights out of Christchurch were cancelled. About 250 skiers were stranded on Mt Lyford overnight after avalanches blocked the road with snow 2-3 m deep.

On 27 July, SH94 from Te Anau to Milford Sound remained closed to towing vehicles, with chains required for all other vehicles. Chains were also needed on Arthurs Pass, and the road closures caused Wanaka to run out of petrol. Removal of rubble from the Christchurch CBD restarted, after snowfalls had stopped work.

On 14 August, a southerly storm brought snow to much of the country, including central Wellington and the hill suburbs. SH2 over the Rimutaka Hills was closed, trapping about 100 people who were rescued using 4-wheel drive vehicles. Sleet stopped play in the men's National Hockey League final in Wellington with around 20 minutes remaining. Queenstown and Dunedin Airports were closed, and flights to Wanaka were also cancelled. Snow-laden trees toppled on to power lines, cutting power to about 3500 customers in the lower North Island.

On 15 August, following the snow of the 14th, major North Island road closures were in force, including SH1 Desert Road to Rangipo to Waiouru to Taihape, SH2 Rimutaka Hill, near Mount Bruce, Dannevirke to Norsewood to Waipukurau, and Gisborne to Nuhaka, SH3 from Inglewood to Stratford, SH5 Napier to Taupo, and Napier to Taihape, SH4 National Park to Raetihi, and SH49 Tohunga Junction (SH4) to Waiouru. South Island roads closed by snow or ice included SH74 the Lyttelton Tunnel Road, Raes Junction to McNab, SH8 Raes Junction to Milton, Alexandra to Roxburgh, and at the Lindis Pass Omarama to Tarras, SH6 Queenstown to Kingston to Five Rivers, SH93 Clinton to Matura, SH1 Kaikoura to Waipara, Palmerston to Dunedin, and Dunedin to Gore, SH85 Kyeburn to Palmerston, and Ranfurly to Omakau, SH93 Clinton to Matura, and SH87 Outram to Kyeburn. Many inner-city roads in Dunedin and hill roads around Wellington were also closed.

Southern District Health Board postponed all outpatient clinics and elective surgery. Airports and schools were closed in Christchurch, Queenstown and Dunedin, and Invercargill Airport was also closed. The University of Canterbury and Christchurch Polytechnic Institute of Technology were closed, as was the Christchurch campus of the University of Otago. Contractors were forced to stop working in Christchurch's Red Zone because of snow and ice. Bus services in Dunedin were cancelled. Power cuts affected about 6000 households in South Taranaki, Manawatu and Wanganui. Wainuiomata Primary School in Lower Hutt was closed because it had no power, heating or phone lines. Many other schools in the Wellington region closed early. Snow again fell down to sea level in Wellington, and as far north as the Kaimai Ranges. Both Rotorua and New Plymouth reported snow falling in the central city, and Te Mata Peak was covered in snow. Road closures meant Fonterra milk tankers were unable to reach about 1700 dairy farms in snow-bound areas of the South Island. All flights in and out of Wellington airport were cancelled in the evening, some buses which service the hill suburbs were cancelled during the afternoon, and all bus services stopped at 7 pm. Some commuter train services from Wellington to Waikanae and Upper Hutt were cancelled or replaced with buses. Snow fell briefly in Auckland city but did not settle, and was also reported from the Waitakere Ranges, Drury, Waiuku, Clevedon and the Bombay Hills. Taupo Airport was also closed as heavy snow fell around the lake, particularly on the western side. In the Waikato, snow was seen in central Hamilton, Te Kuiti, and briefly in Raglan. Snow settled in Wanganui, reputedly for the first time since 1974. On the West Coast, snow fell in Rotomanu, Inchbonnie, Reefton, Greymouth, Blackball and Ikamatua. Awahono School at Ahaura closed at lunchtime because of the snow. Eight adults and 16 school pupils spent an extra night on Mt Ruapehu as the road down was too icy to safely navigate and major highways were closed.

On 16 August, all Dunedin kindergarten, primary, intermediate and secondary schools remained closed for a second day, and in Wellington icy roads forced the closure of several schools. Many Wellington hill suburb roads remained closed, bus services were cancelled, and the Cable Car was also out of action. Many schools in Canterbury, both universities, and most schools in Southland were also closed. Canterbury District Health Board cancelled all outpatient clinics, elective and non-urgent surgery. Some customers in Wanganui, Manawatu and Taranaki were without electricity overnight after snow and falling trees damaged power lines. Snow falling into the uplink dish at TVNZ's Avalon studios in Lower Hutt caused the loss of Freeview channel reception. There were no mail deliveries in the lower North Island. The snow reached Northland with hillside properties around Dargaville reporting snow falling. The Tranz Alpine passenger train was stopped by snow at Springfield. All South Island passes were closed, and other road closures included SH1 Kaikoura to Waipara and Waikouaiti to Dunedin, SH63 the Wairau Valley to Kawatiri, SH6 Queenstown to Kingston and to Five Rivers, SH8 from Fairlie to Lake Tekapo, SH79 from Geraldine to Fairlie, SH85 from Kyeburn to Palmerston, SH87 from Kyburn to Outram, SH93 Clinton to Matura, SH96 Matura to Te Tipua, SH94 Te Anau to Milford Sound, SH65 from O'Sullivan's Bridge to Springs Junction, and SH7 from Springs Junction to Reefton. North Island closures included SH1 between Waiouru and Vinegar Hill, and from Rangipo to Waiouru, the Napier-Taupo road, SH4 from Wanganui to National Park, SH49 from Ohakune to Waiouru, SH46 from Tongariro to Rangipo, SH47 National Park to Turangi, SH54 Cheltenham to Vinegar Hill, and SH2 from Brown Owl to Te Marua, over the Rimutaka Hills between Wairarapa and Wellington, from Ekatahuna to Mt Bruce, and between Morere and Bartletts. Black ice affected SH1

between Levin and Manakau, Ngauranga Gorge and the northern motorway of Wellington, and SH56 near the Longburn overbridge. A helicopter with four passengers was forced to land in the Lammerlaw Range on a trip from Queenstown to Dunedin. The tourists were rescued on the 17th, and the pilot flew out on the 18th.

On 17 August, the snow storm battering Wellington caused the closure of many kindergartens, primary, intermediate and secondary schools and roads throughout the region, and the cancellation of all Cook Strait passenger ferries. The snow, together with high winds, caused more damage to power lines cutting electricity supply across South Taranaki, rural Wanganui, Manawatu and Wairarapa. Some roads remained closed, including SH1 at the Desert Road, Taihape to Waiouru, and at Hunterville, SH2 at the Rimutaka Hill Road, Te Marua to Pakuratahi, and Muriwai to Morere, SH5 the Napier to Taupo Highway, and SH54 from Cheltenham to Vinegar Hill, SH7 from Springs Junction to Reefton, SH7 from Springs Junction to Hanmer Springs, SH73 at Porters Pass and at Otira, and SH65 at Shenandoah. Severe ice caused the closure of SH36 from Rotorua to Tauranga. There were no mail deliveries to Ohakune, Raetihi, Waiouru, Taihape and Hunterville, and limited deliveries in Christchurch, Queenstown and Dunedin. In Rotorua black ice was reported on the roads to Tokoroa and Tirau, as well as SH5 south of the city. South Canterbury roads re-opened to vehicles with chains, but remained closed to towing vehicles. SH2 over the Rimutaka Ranges was re-opened late afternoon. Queenstown Airport re-opened, and a start was made on clearing the backlog of stranded passengers, but most schools in the area remained closed.

On 18 August, snow was finally cleared from SH87, the last of the Otago highways to be cleared, liberating locals at Clarks Junction and Middlemarch who had been cut off for four days. On 19 August, ice warnings were still in place for SH8 from Milton to Raes Junction.

- **Lightning and hail**

On 23 June, lightning struck homes in Whakatane, damaging electrical and telecommunication-linked appliances, and causing smoke damage. Power and telephone connections were cut to several homes.

On 8 July, an RNZAF Boeing 757 was hit by lightning a few minutes after take-off from Whenuapai. It circled the airbase for about 1.5 hours waiting for a break in the weather before landing back at Whenuapai. On the same day in New Plymouth, a ferocious thunderclap, centred above the city, woke many people at about 2 am.

A severe thunderstorm on 9 July crossed the Auckland region, with lightning striking the Sky Tower. In Bulls, hail the size of marbles was reported, causing bullet-sized holes in windows. The Tui Nature Reserve in outer Pelorus Sound had 2 cm hail-stones which damaged corrugated plastic roof panels.

On 10 July, it was the turn of Wanganui, Rangitikei, and Palmerston North, for roaring thunderstorms and lightning. A lightning strike on the Bastia Hill Water Tower in Wanganui took down the wireless network, and blew the pole fuses.

In the early hours of 11 July, a severe lightning storm struck Northland. A lightning strike caused an outage, cutting electricity supplies to customers in the Tophouse area and in the Howard Valley. Telecommunications were also affected when lightning struck the Mt Murchison transmitter.

On 12 July, an Air New Zealand plane was struck by lightning just after taking off from Auckland. The plane returned to Auckland for safety checks. Parts of New Plymouth were without power for about an hour after lightning caused a tree branch to fall on to an overhead line. Lightning is also thought to have started a large bush fire in the Hinewai Reserve on the eastern side of Banks Peninsula. Further south, a lightning strike in Invercargill caused street light outages across parts of the city.

Two cyclists were struck by lightning on 13 July on the Little River Rail Trail near Birdlings Flat in Canterbury. The two boys were thrown from their bicycles and were shaken but uninjured. In Ngahere near Greymouth, a bull was killed by lightning, and several cows were knocked off their feet, but survived. The same storm brought hail about 2 cm deep to Franz Josef township. At Gladstone, birds were reported falling out of the sky after being hit by hail and lying dead on the road.

On 7 August, hail was reported over Wellington, associated with the sudden arrival of a southerly front. In

Invercargill, many residents were woken by an early morning thunderstorm.

On 14 August, two Air New Zealand planes were struck by lightning at Wellington Airport. They were grounded for engineering checks. Hail fell over most of Christchurch. Heavy hail and lightning affected Taranaki on 15 August, with power cuts to parts of South Taranaki. A loud thunder and lightning storm struck Wellington, with frequent brief power outages.

- **Rain and slips**

The highest 1-day rainfall experienced in winter 2011 was 128 mm recorded at Arthurs Pass on 10 July.

On 8 June, heavy rain caused flooding on SH3 south of Waitara, and surface flooding in New Plymouth. The Waitara River undercut its banks near Tarata, causing part of Motukawa Road to slip into the river.

On 18 June, after heavy rain, a slip came down on a house at Ohope Beach, killing a young man. The rain also caused significant flooding in Whakatane town centre. Further north, there was significant surface flooding on SH1 at Mercer.

Heavy rain on 5 July in Gisborne caused surface flooding, and overloaded the stormwater and sewerage systems. Gisborne Girls High School was closed because the toilet drains were blocked. A large slip blocked Waingake Road, about 16 km up the valley, and many other roads were closed by flooding, including Kaiti Beach Road where cars could not get in or out of the settlement. On 6 July, heavy rain and strong winds in the Wanganui area damaged the Marangai sub-station, cutting power to the central city, the airport, Kaitoke, Marybank and Putiki.

On 13 July, many roads in the Golden Bay and Motueka areas were closed by slips and fallen trees, after persistent heavy rain. Many slips and washouts were reported in Wanganui and the wider Wanganui District on the 14th, with power outages at Kaiwhaiki, Makirikiri, Parihauhau, Parikino, River Road and Upokongaro.

On 22 July, heavy rain caused a sewage spill in Whangarei, flooded several roads in the city, and flooded pasture to a depth of about a metre at Hikurangi, Otaika, and Maungatapere. In Napier, home-owners were evacuated after two more slips came down on Napier Hill.

Record or near record high extreme 1-day rainfall totals were recorded at:

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Wanganui	51	Jul-13th	1987	Highest

- **Wind**

The highest wind gust recorded during winter 2011 was 189 km/hr observed at Cape Turnagain on 12 July.

On 19 June, New Plymouth central business district and nearby residential areas were struck by two tornadoes, which smashed windows, lifted roofs, sucked furniture out of buildings, pulled up trees by their roots, and tore up streets in their path. At New Plymouth racecourse, winds sucked out barn doors to four stable blocks, destroyed a long section of near-new racetrack running rail, sheared off steel uprights at ground level, and tossed a horse transporter on to its side. Bell Block and Omata were also affected by a swarm of tornadoes, with New Plymouth Clay Target Club clubrooms at Omata reduced to matchsticks. About 300 properties in central New Plymouth lost power for several hours as a result of the tornadoes, with damage to both high-voltage and low-voltage parts of the network.

Gale force winds closed Northcote wharf on Auckland's North Shore on July 8th, with ferry services disrupted. In Wellington early morning trains were cancelled on the Johnsonville line between Johnsonville and Ngaio for about an hour.

On 9 July, a tornado tore through Peka Peka beach, just north of Waikanae. Trees were brought down, crushing cars and a caravan, injuring the occupants. Sheds were demolished, roofs blown off, and cars blown over. One vehicle on SH1 was tossed 30 m into a paddock, with the driver suffering only minor injuries. A woman walking near the coast also suffered minor injuries when she was blown over. Power lines were damaged cutting power to some areas. In Wairarapa, a building wall was blown loose at Matahiwi Vineyard, north of Masterton, and dozens of line disconnections were caused by the strong winds.

On 11 July, a trampoline was blown onto railway tracks in Upper Hutt, and power lines were blown down in Johnsonville. Several homes in Greymouth, and one in Kaiwaka had their roofs blown off. In Ohope, garden furniture was blown all over the town. Powerlines were blown down in Matamata, while Wellington City Council asked residents to not put out their recycling, after rubbish was strewn around some suburbs. In Masterton, falling branches crushed cemetery headstones. Power was cut to customers in Taranaki after a tree was blown down over 11,000 volt lines, lightning strikes damaged transformers, and severe winds damaged network equipment.

Wanganui's Cooks Gardens were closed on 12 July after strong winds undermined the floodlight towers. Homes in Omaui, Southland were left without electricity overnight after strong winds tore down power lines, with telephone lines also brought down. In Hawke's Bay a caravan being towed on SH2 near Waipawa was toppled on to its side by the strong gusts across the Takapau Plains. At Whangara near Gisborne, a hayshed was blown down, and trees were blown into power lines causing power outages in Tauwhareparae and Wairoa. In New Plymouth, a gust lifted a plastic giant ice-cream scoop off the top of a shop and sent it hurtling down St Aubyn Street, and in coastal Kaipokonui, power lines snapped in high winds. A large tree fell on to SH3 north of Normanby, and several road signs were blown down on the Surf Highway north of Eltham.

On 13 July, strong winds battered the Kapiti Coast, uprooting trees, lifting roofs, and bringing down powerlines in Paraparaumu. All along the west coast from Kapiti to Taranaki, sea birds, mainly prions and petrels, were blown inland by the strong westerly winds, and many birds were killed. Wind warnings were issued for SH6, Whataroa to Haast. In Greymouth, the roof the West Coast Regional Council in Paroa had to be secured after it began to lift in the wind, and the nearby pony club roof was blown across SH6, stopping traffic. Many trees were felled in the Hokitika, Greymouth and Blackball area, roofs and fences damaged, and some windows blown out.

On 22 July, two trucks were overturned by wind on SH57 between Shannon and Opiki, and power lines were blown down in the Kapiti area. A tornado was recorded in Waipu, destroying caravans and sheds in its path.

On 27 July, wind warnings were in place on SH8 between Lawrence and Milton, SH90 between Tapanui and Gore, and SH1 between Milton and Gore. On the 28th, wind warnings remained in place for SH1, Milton to Gore, SH8, Lawrence to Milton, and SH90, Tapanui to Gore.

A twister was reported on 11 August at Waiharara, north of Kaitaia.

On 14 August, a truck was blown off Old Coach Rd between Clinton and Mataura, but the driver was not injured. On the 15th, high winds made driving on the Auckland Harbour Bridge difficult, and in Pakuranga Heights a tree was blown over on to a house. In Christchurch, strong winds snapped power poles, cutting electricity in some areas.

Near-record high extreme wind gusts for winter were recorded at:

Location	Extreme wind gust speed (km/hr)	Date of extreme gust	Year records began	Comments
Hamilton Aws	85	Jul-06th	1978	4th-highest
Hawera Aws	100	Jul-12th	1986	3rd-highest
Farewell Spit Aws	109	Jul-09th	1973	Equal highest
Westport Aero Aws	106	Jul-11th	1973	Equal 4th-highest

- **Temperatures**

The highest winter temperature recorded was 22.4°C at Whitianga on 5 June (a new winter record there since observations began in 1962). Numerous sites broke winter temperature records on 5 June, during an extremely mild northerly air stream brought down from the sub-tropics. The lowest temperature recorded was -10.2°C at Manapouri on 26 July - a new winter record and all-time (any month) record at this site. Numerous new winter low temperature extremes were observed (for both minimum and maximum temperatures) during the two snow events (25-26 July and 14-17 August).

Record or near-record daily maximum air temperatures for winter were recorded at:

Location	Extreme maximum temperature (°C)	Date of extreme temperature	Year Records Began	Winter ranking [An asterisk (*) indicates an all-time (any-month) record low rank]
Kerikeri	21.8	Aug-30th	1981	Highest
Leigh	22.2	Jun-05th	1966	Highest
Warkworth	20.4	Jun-05th	1966	3rd-highest
Whangaparaoa	21.4	Jun-05th	1982	Highest
Whenuapai	20.5	Jun-05th	1945	Equal 3rd-highest
Henderson	22.1	Jun-05th	1948	Equal 2nd-highest
Whitianga	22.4	Jun-05th	1962	Highest
Te Puke	20.4	Jun-05th	1973	2nd-highest
Opotiki	21.2	Jul-01st	1947	2nd-highest
Auckland (Airport)	21.1	Jun-05th	1959	2nd-highest
Ardmore	22.0	Jun-05th	1969	2nd-highest
Hamilton	20.6	Jun-05th	1946	2nd-highest
Port Taharoa	20.2	Jun-05th	1973	Highest
Waikeria	20.8	Jun-05th	1977	2nd-highest
Kopua	20.3	Jun-05th	1962	Highest
Palmerston North	20.9	Jun-05th	1918	Equal 2nd-highest
Taihape	19.4	Jun-05th	1972	Highest
Wanganui	21.2	Jun-05th	1937	3rd-highest
Lake Rotoiti	17.5	Aug-23rd	1965	Highest
Stephens Island	15.5	Jun-07th	1973	Equal 3rd-highest
Kaitaia	10.9	Aug-15th	1985	Equal 4th-lowest
Dargaville	9.2	Aug-16th	1951	2nd-lowest
Whangarei	9.6	Aug-16th	1967	Lowest
Warkworth	8.1	Aug-16th	1966	Lowest
Whenuapai	8.8	Aug-16th	1951	2nd-lowest
Whitianga	8.2	Aug-15th	1971	Lowest*
Paeroa	8.1	Aug-15th	1971	3rd-lowest
Whakatane	8.9	Aug-15th	1975	Equal 4th-lowest
Rotorua	5.7	Aug-15th	1972	Lowest*
Taupo	4.7	Aug-15th	1950	3rd-lowest
Auckland (Airport)	8.1	Aug-15th	1961	Lowest*
Pukekohe	8.2	Aug-16th	1969	Equal 3rd-lowest
Port Taharoa	8.6	Aug-15th	1974	Lowest*
New Plymouth	6.7	Jul-25th	1944	2nd-lowest
Masterton	2.1	Aug-15th	1943	Lowest
Takapau Plains	2.2	Aug-15th	1972	Lowest*
Castlepoint	3.2	Aug-15th	1972	Lowest
Martinborough	3.5	Aug-15th	1986	Lowest*
Ngawi	6.2	Aug-15th	1972	Lowest*
Hicks Bay	8.8	Aug-15th	1972	2nd-lowest

Waipawa	5.5	Aug-17th	1945	4th-lowest
Wairoa	7.4	Jul-25th	1972	4th-lowest
Paraparaumu	6.1	Aug-15th	1972	4th-lowest
Wellington ² (Airport)	6.8	Aug-15th	1972	2nd-lowest
Wallaceville	4.2	Aug-15th	1972	Equal lowest*
Stratford	4.8	Jul-25th	1972	3rd-lowest
Hawera	7.1	Jul-25th	1977	2nd-lowest
Waiouru	-1.0	Aug-15th	1972	2nd-lowest
Wanganui	8.2	Jul-25th	1987	3rd-lowest
Lake Rotoiti	-0.5	Aug-15th	1972	Lowest
Puyssegur Point	4.9	Aug-15th	1978	3rd-lowest
Appleby	6.6	Aug-15th	1943	Equal 2nd-lowest
Nelson	6.1	Aug-15th	1943	2nd-lowest
Hanmer Forest	0.1	Aug-15th	1972	Lowest*
Kaikoura	3.5	Aug-15th	1972	Lowest*
Arthurs Pass	-2.5	Aug-15th	1973	Lowest*
Cheviot	2.8	Aug-15th	1982	Lowest*
Waipara West	2.6	Aug-15th	1973	Lowest*
Le Bons Bay	3.5	Aug-15th	1984	Equal lowest
Manapouri	0.9	Jul-24th	1973	3rd-lowest
Lumsden	1.0	Jul-24th	1982	Equal 3rd-lowest

Record or near-record daily minimum air temperatures for winter were recorded at:

Location	Extreme minimum temperature (°C)	Date of extreme temperature	Year records began	Winter ranking [An asterisk (*) indicates an all-time (any-month) record low rank]
Leigh	2.6	Aug-16th	1966	Lowest*
Whangaparaoa	2.3	Aug-16th	1982	2nd-lowest
Te Puke	-2.2	Aug-16th	1973	4th-lowest
Rotorua	-5.2	Aug-16th	1964	Equal lowest*
Port Taharoa	0.1	Aug-16th	1973	2nd-lowest
New Plymouth	-2.6	Jul-26th	1944	Lowest
Castlepoint	0.0	Aug-15th	1972	2nd-lowest
Ngawi	0.6	Aug-15th	1972	2nd-lowest
Hicks Bay	1.0	Aug-16th	1969	4th-lowest
Stratford	-4.6	Aug-16th	1960	4th-lowest
Westport	-2.5	Aug-15th	1937	2nd-lowest
Lake Rotoiti	-10.1	Aug-16th	1965	2nd-lowest
Greymouth	-2.3	Jul-26th	1947	4th-lowest
Haast	-3.5	Aug-15th	1949	Lowest
Milford Sound	-6.1	Jul-11th	1934	Lowest
Blenheim	-6.2	Aug-16th	1932	3rd-lowest
Kaikoura	-1.0	Aug-15th	1963	Lowest
Le Bons Bay	-2.3	Aug-15th	1984	Lowest
Timaru	-7.8	Jul-26th	1990	2nd-lowest
Manapouri	-10.2	Jul-26th	1963	Lowest*
Queenstown	-8.9	Jul-26th	1871	4th-lowest
Kaikohe	19.1	Jun-19th	1973	Highest
Whangaparaoa	14.7	Jun-05th	1982	3rd-highest

² The Wellington Airport maximum temperature of 6.8°C recorded between 9am on August 15th and 9am on August 16th ranked as the all-time (any month) 2nd-lowest maximum temperature at this site.

Whakatane	15.1	Jun-05th	1975	2nd-highest
Port Taharoa	14.9	Jun-06th	1974	4th-highest
Taumarunui	13.7	Jun-05th	1947	4th-highest
Stratford	12.0	Jun-05th	1972	Equal 3rd-highest
Hawera	13.5	Jun-05th	1977	3rd-highest
Ohakune	11.4	Jun-05th	1972	Equal highest
Lake Rotoiti	8.1	Jun-05th	1972	2nd-highest
Haast	12.4	Jun-05th	1949	2nd-highest
Motueka	12.0	Jun-06th	1972	2nd-highest
Dunedin	12.2	Jun-01st	1947	2nd-highest
Balclutha	9.4	Jun-01st	1972	Equal 2nd-highest

- **Fog**

On 9 June, heavy fog in Auckland cancelled or delayed about 20 flights, and slowed motorway traffic.

On 18 July, Christchurch Airport was affected by fog, causing delays, and affecting the start that day of the Pike River Mine Disaster enquiry.

On 12 August, fog caused the cancellation of five early morning flights from Dunedin Airport to Christchurch, Wellington and Auckland. Flights resumed about 11 am.

On 13 August, thick fog at Auckland Airport caused cancellations and delays for many domestic flights, and delays for international flights.

For further information, please contact:

Ms Georgina Griffiths – Climate Scientist– NIWA National Climate Centre, Auckland,

Tel. (09) 375 4506 (office) or (027) 293 6545 (mobile)

Dr Andrew Tait – Climate Scientist – NIWA National Climate Centre, Wellington,

Tel. (04) 386 0562 (work) or (027) 327 7948 (mobile)

www.niwa.co.nz/ncc

Copyright NIWA 2011. All rights reserved.