

National Climate Summary – Spring 2011: Extremely dry Taupo north; wet eastern South Island

- **Rainfall: Extremely dry north of Taupo, with about half of normal spring rainfall. Very dry in Gisborne, Hawkes Bay, and along the West Coast of the South Island. Extremely wet for Southland, Otago, and Canterbury.**
- **Soil moisture levels: Significant deficit north of Taupo, as well as Gisborne, Hawkes Bay, Marlborough, and central Otago, at the end of spring.**
- **Temperatures: Above average in the northeastern North Island. Below average for the southeastern North Island, as well as Canterbury. Near average elsewhere.**
- **Sunshine: A sunny spring in eastern regions; near normal spring sunshine elsewhere.**

Stronger than normal southwest winds affected New Zealand during spring 2011, squeezed between higher than normal pressures over the Tasman Sea and lower pressures to the southeast of the country.

It was an extremely dry spring north of Taupo, with about half of normal spring rainfall observed in Taupo, parts of the Waikato, Coromandel, north Auckland and Northland. It was the driest spring on record for Matamata and Leigh. Spring rainfalls were also below normal (between 50 and 79 percent of spring normal) in Gisborne, Hawkes Bay, and much of the West Coast of the South Island. In contrast, spring rainfalls were above normal in Southland, Otago and Canterbury, as well as in some locations between New Plymouth and Levin (with totals more than 120 percent of spring normal). Spring rainfall totals were generally close to seasonal normal elsewhere (between 80 and 119 percent of normal).

By the end of spring, significant soil moisture deficit (more than 110 mm of deficit) was observed in regions north of Taupo, also Hawkes Bay, Gisborne, Marlborough, and central Otago.

Mean temperatures in spring were above average (between 0.5°C and 1.2°C above spring average) in eastern Northland, Coromandel, and Bay of Plenty. Regions which experienced below average spring temperatures (between 0.5°C and 1.2°C below average) were around the Central Plateau, Hawkes Bay, Wairarapa, Wellington, and Canterbury. Elsewhere, for much of the country, temperatures were within 0.5°C of spring average. The nation-wide average temperature in spring was 11.9°C (0.2°C below the 1971–2000 spring average) using NIWA's seven-station temperature series which begins in 1909.

Spring 2011 was a sunny month in eastern regions of both islands, with above normal sunshine totals (between 110 and 125 percent of spring normal), consistent with the frequent southwest winds during the spring. Elsewhere, sunshine totals were generally near normal (between 90 and 110 percent of spring normal).

Further Highlights:

- The highest temperature was 29.5°C, observed at Middlemarch on 27 November.
- The lowest temperature was -6.4°C, at Mt Cook on 5 November.
- The highest 1-day rainfall experienced was 166 mm at North Egmont on 3 October.
- The highest gust recorded was 183 km/hr at Southwest Cape, Stewart Island, on 24 October.
- Of the six main centres in spring 2011, Tauranga was the warmest and sunniest, Wellington the wettest, Christchurch the driest, Hamilton the cloudiest, and Dunedin the coolest.

For further information, please contact:

**Ms Georgina Griffiths – Climate Scientist– NIWA National Climate Centre, Auckland,
Tel (09) 375 4506 (office DDI), Mobile (027) 2936545
Dr James Renwick, NIWA Principal Scientist, Climate Variability & Change
Mobile (021) 178 5550, Tel (04) 386 0343 (office DDI)**

RAINFALL: EXTREMELY DRY NORTH OF TAUPO, WITH ABOUT HALF OF NORMAL SPRING RAINFALL. ALSO VERY DRY IN GISBORNE, HAWKES BAY, AND ALONG THE WEST COAST OF THE SOUTH ISLAND. IN CONTRAST, EXTREMELY WET FOR MUCH OF SOUTHLAND, OTAGO AND CANTERBURY, AND WET BETWEEN NEW PLYMOUTH AND LEVIN.

It was an extremely dry spring north of Taupo, with about half of normal spring rainfall observed in Taupo, parts of the Waikato, Coromandel, north Auckland and Northland. It was the driest spring on record for Matamata and Leigh. Spring rainfalls were also below normal (between 50 and 79 percent of spring normal) in Gisborne, Hawkes Bay, and much of the West Coast of the South Island. In contrast, spring rainfalls were above normal in Southland, Otago and Canterbury, as well as in some locations between New Plymouth and Levin (with totals more than 120 percent of spring normal). Spring rainfall totals were generally close to seasonal normal elsewhere (between 80 and 119 percent of normal).

By the end of spring, significant soil moisture deficit (more than 110 mm of deficit) was observed in regions north of Taupo, also Hawkes Bay, Gisborne, Marlborough, and central Otago.

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

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
Timaru	189	137	1990	3rd-highest
Ranfurly	197	193	1943	2nd-highest
Lumsden	247	111	1982	3rd-highest
Gore	303	136	1950	4th-highest
Kaitaia	225	70	1985	4th-lowest
Kerikeri	211	47	1981	3rd-lowest
Whangarei	131	41	1937	2nd-lowest
Leigh	152	57	1966	Lowest
Paeroa	160	53	1914	3rd-lowest
Matamata	147	51	1951	Lowest
Taupo	153	56	1949	4th-lowest

TEMPERATURE: ABOVE AVERAGE FOR EASTERN NORTHLAND, COROMANDEL, BAY OF PLENTY. BELOW AVERAGE TEMPERATURES FOR PARTS OF THE CENTRAL PLATEAU, HAWKES BAY, WAIRARAPA, WELLINGTON, AND CANTERBURY. NEAR AVERAGE ELSEWHERE.

Mean temperatures in spring were above average (between 0.5°C and 1.2°C above spring average) in eastern Northland, Coromandel, and Bay of Plenty. Regions which experienced below average spring temperatures (between 0.5°C and 1.2°C below average) were around the Central Plateau, Hawkes Bay, Wairarapa, Wellington, and Canterbury. Elsewhere, for much of the country, temperatures were within 0.5°C of spring average. The nation-wide average temperature in spring was 11.9°C (0.2°C below the 1971–2000 spring average) using NIWA’s seven-station temperature series which begins in 1909¹.

Several sites in the northeast of the North Island (Northland, Auckland) experienced unusually high afternoon (maximum) temperatures, on average, during the spring (see Table overleaf), and several sites in eastern locations recorded unusually low morning (minimum) temperatures, on average for the season.

¹ Interim monthly value.

Record or near-record monthly-average maximum air temperatures for Spring were recorded at:

Location	Mean maximum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Kerikeri	19.7	0.6	1981	3rd-highest
Kaikohe	18.2	1.2	1973	3rd-highest
Leigh	19.6	2.0	1966	2nd-highest
Whangaparaoa	18.2	1.3	1982	4th-highest
Orari Estate	15.5	-1.0	1972	4th-lowest

Record or near-record monthly-average minimum air temperatures for Spring were recorded at:

Location	Mean minimum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Martinborough	6.4	-1.2	1986	2nd-lowest
Motueka	5.6	-1.2	1956	3rd-lowest
Hanmer Forest	2.1	-1.8	1906	3rd-lowest
Timaru	3.6	-1.3	1990	Lowest
Lumsden	3.7	-0.8	1982	3rd-lowest

SUNSHINE: SUNNY ALONG EASTERN COASTS OF BOTH ISLANDS. NEAR NORMAL SPRING SUNSHINE ELSEWHERE.

Spring 2011 was a sunny month in eastern regions of both islands, with above normal sunshine totals (between 110 and 125 percent of spring normal), consistent with the frequent southwest winds during the spring. Elsewhere, sunshine totals were generally near normal (between 90 and 110 percent of spring normal).

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

Location	Sunshine (hours)	Percentage Of normal	Year records began	Comments
Te Kuiti	523	123	1962	3rd-highest
Cheviot	624	117	1983	2nd-highest
Balclutha	602	130	1964	2nd-highest

SPRING CLIMATE IN THE SIX MAIN CENTRES

Spring temperatures were near average, and spring rainfall totals were near normal at all of the six main centres, except Tauranga (which was warmer and drier than usual) and Christchurch (which was cooler and wetter than usual). Dunedin and Tauranga experienced above normal spring sunshine totals, while the other main centres recorded near normal sunshine.

Of the six main centres for spring 2011, Tauranga was the warmest and sunniest, Wellington the wettest, Christchurch the driest, Hamilton the cloudiest, and Dunedin the coolest.

Spring 2011 main centre climate statistics:

Location	Mean temp. (°C)	Departure from normal (°C)		Rainfall (mm)	% of normal		Sunshine (hours)	% of normal	
Auckland ^a	14.4	-0.1	Near average	246	88%	Near normal	533	103%	Near normal
Tauranga ^b	14.6	+0.8	Above average	185	65%	Below normal	658	114%	Above normal
Hamilton ^c	12.9	+0.1	Near average	248	84%	Near normal	530 ^g	102%	Near normal
Wellington ^d	12.0	-0.1	Near average	305	97%	Near normal	554	99%	Near normal
Christchurch ^e	10.9	-0.6	Below average	176	125%	Above normal	571	99%	Near normal
Dunedin ^f	10.8	-0.1	Near average	183	98%	Near normal	533	122%	Above normal

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

HIGHLIGHTS AND EXTREME EVENTS

• Rain and slips

The highest 1-day rainfall experienced in Spring 2011 was 166 mm at North Egmont, on 3 October. An extremely heavy spring rainfall event affected Nelson and New Plymouth on 2/3 October, caused by numerous thunderstorms embedded in a strong, moist, northeasterly airstream. The thunderstorms caused an estimated 20,000 lightning strikes to western North Island areas during that day. And Otago was badly affected on October 18, when heavy rain caused surface flooding and slips in and around Dunedin, Oamaru and Temuka. Both of these events produced record or near-record high spring rainfalls (see Table overleaf).

On 2 October, heavy rain caused the cancellation of the Big Tahuna festival in Nelson. Heavy rain on 3 October caused the cancellation of planned outdoor performances in the Nelson Arts Festival. Some roads in Matai Valley were closed by flooding. Nelson Council closed Waimea Inlet and Nelson Haven to shellfish collection and swimming, partly because of the high storm-water run-off. Farmers in Bay of Plenty were warned to shift stock to high ground after very heavy rain in the region.

On 18 October, heavy rain caused surface flooding and slips in and around Dunedin, Oamaru and Temuka. Roads closed included Three Mile Hill from Mosgiel to Dunedin, SH88 from Sawyers Bay to Port Chalmers, Portobello Road, Toko Mouth Road, near Milton, Silverstream Valley Road, SH90 from Tapanui to McNab, and SH6 north of Dipton. Downed trees blocked roads in Oamaru and Waimate. Further north, heavy rain caused another massive slip on SH3 in the Manawatu Gorge.

On 19 October, heavy rain caused flooding in Little River, with SH75 closed from Birdlings Flat to Little River. In Christchurch, the Heathcote River breached its banks in several areas, with many roads closed by flooding. SH1 north of Oamaru, was closed by flooding at Hilderthorpe, and also flooded to the south near Moeraki, where one lane was closed. In the Waitaki District, flooding closed many rural roads. In Southland, heavy rain caused rivers and streams to swell, closing roads in eastern and northern Southland, and isolating the township of Waikaia. SH90 was closed between Tapanui and McNab.

On 25 October, flooding affected SH6 between Harihari and Franz Josef.

On 16 November, heavy rain caused surface flooding in Levin.

Heavy rain on 20 and 21 November caused flooding and road closures on the West Coast. Slips closed SH6 in the lower Buller Gorge, SH7 at the Lewis Pass, and many rural roads in the district. A slip near the Shenandoah Saddle reduced SH65 to one lane. The Grey River burst its banks, and there was extensive flooding of farmland. Widespread stock losses were reported, including one of cattle being electrocuted after floodwaters brought down power lines. In Greymouth, the racecourse, golf course, speedway, and sports grounds were covered in water and silt, with damage to infrastructure. Surface flooding and strong winds also affected SH73 at Arthurs Pass.

On 22 November, the Maitava River burst its banks, and nearby roads were closed by flooding. On 25 November, flooding closed SH56 at Opiki.

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

Location	Extreme 1-day rainfall (mm)	Date of extreme rainfall	Year records began	Comments
Te Puke	79	Oct-11th	1973	4th-highest
New Plymouth	102	Oct-3rd	1944	3rd-highest
Stratford	137	Oct-3rd	1960	Highest
Nelson	85	Oct-2nd	1941	4th-highest
Winchmore	59	Oct-18th	1927	4th-highest
Timaru (Gardens)	66	Oct-18th	1881	3rd-highest
Oamaru	70	Oct-18th	1898	4th-highest
Lumsden	53	Oct-17th	1982	3rd-highest

• **Temperatures**

The highest temperature recorded in spring 2011 was 29.5°C, observed at Middlemarch on 27 November. The lowest temperature was -6.4°C, recorded at Mt Cook on 5 November, during an unusual late-season pulse of cold air, which brought snow to much of Southland, Otago, as well as Banks Peninsula.

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

Location	Extreme maximum temperature (°C)	Date of extreme temperature	Year Records Began	Ranking
Kaikohe	24.7	Nov-21st	1973	2nd-highest
Whangarei	26.7	Nov-28th	1967	2nd-highest
Leigh	25.0	Nov-23rd	1966	2nd-highest
Whangaparaoa	23.3	Nov-28th	1982	4th-highest
Lumsden	25.1	Nov-30th	1982	3rd-highest
Lumsden	5.8	Sep-13th	1982	4th-lowest

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

Location	Extreme minimum Temperature (°C)	Date of extreme temperature	Year records Began	Ranking
Whangaparaoa	6.1	Sep-26th	1982	4th-lowest
Te Puke	-0.2	Sep-3rd	1973	3rd-lowest
Mahia	2.2	Sep-3rd	1990	Lowest
Takaka	-1.8	Sep-3rd	1978	3rd-lowest
Le Bons Bay	1.1	Nov-5th	1984	Equal 4th-lowest
Whitianga	18.1	Nov-24th	1971	Equal highest

- **Wind**

The highest gust recorded during spring 2011 was 183 km/hr observed at Southwest Cape, Stewart Island, on 24 October. On this day, extreme wind gusts were also experienced throughout Southland and Central Otago (see Table overleaf).

On 11 September, a tornado swept through the Auckland suburbs of Avondale and Te Atatu South, damaging homes, felling trees and downing power lines. In the Hauraki Gulf, savage wind gusts caused problems for yachts in the Simrad 100 race, snapping masts and causing one yacht to run aground.

Wind warnings were issued on 14 September for roads in Taranaki, Waikato, Auckland, Coromandel Peninsula, and western Bay of Plenty. A tornado in Pehiri Valley, inland from Gisborne, damaged property and uprooted trees.

On 18 October, wind warnings were issued for SH1 from Waimate to Palmerston, SH83 from Pukeuri to Omarama, and SH87 from Outram to Kyburn. In South Canterbury, downed trees blocked roads and caused power outages.

On 24 October, severe winds brought down power poles and trees, smashed windows and lifted roofing iron in Central Otago, Maniototo and Southland. Power was cut to many areas, and many roads were closed, including the Ranfurly to Naseby Road, and SH6. A 15 m-long catamaran was blown from its moorings at Kelvin Grove out to the centre of Queenstown Arms, and a jet-ski was torn from a car port and dumped upside down on a veranda below. Many fires were caused by downed power lines. Further north, tourists had to be evacuated from a backpackers' hostel in Mt Cook Village, after it suffered structural damage, including the destruction of a large picture window which framed the view of Mt Cook. The mast of the NIWA climate station at Mt Cook was also destroyed, after gusts to 180km/hr were recorded.

Gale-force winds blew down trees in Wanganui on 16 November, downing power lines and cutting power to several areas. On 17 November, wind warnings were issued for SH1 between Milton and Gore.

Gales struck the lower North Island on 21 November. In Greytown, a tree branch was blown off, injuring two pedestrians who were admitted to Masterton Hospital. Some flights were delayed at Wellington Airport, with one flight from Auckland making two attempts to land, before giving up and returning to Auckland. Several harbour commuter ferries were cancelled, and a large, high-sided carrier, unable to berth at Aotea Quay, was forced to leave the harbour and circle at the heads where conditions were calmer. In Wainuiomata, a large tree was blown on to a house. Near Palmerston North, a truck and trailer unit was blown off the road. Westport Airport was closed by the storm.

On 22 November, high winds caused damage in Hawke's Bay, downing trees and power lines. Lowburn Road, near Cromwell, was closed in high winds because of the danger of falling trees.

On 23 November, strong winds in Wellington blew a window out of the 10th floor of a central city office building, and deposited it in a car park 100 m away. A cruise ship needed the help of a tug to berth, and several flights in and out of Wellington airport were delayed.

Gales battered Southland and Otago on 25 November, downing trees and power lines. Fallen trees caused temporary closures of SH1 north of Waitati, and later in north Dunedin. Wind warnings were issued for SH8 from Milton to Raes Junction, SH90 from Raes Junction to Gore, and SH87 from Kyeburn to Middlemarch. The motorcycle beach racing event at Oreti Beach, part of Invercargill's big Burt Munro Challenge events, was cancelled. A truck blew over in Wyndham bringing down power lines, and in Invercargill, a car door was found blowing down the road.

On 26 November, strong winds made life difficult for the cyclists in the annual Lake Taupo Cycling Challenge, with scattered branches and debris strewn across SH32. The 80 km mountain bike race was cancelled after two hours. In Stratford, marquees were blown over at the annual A & P show.

On 28 November, wind warnings were issued for SH73 between Springfield and Arthur's Pass. In Picton, strong winds caused the Aratere to swing away from its berth, wrenching out a bollard, damaging both the wharf and the ship.

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

Location	Extreme wind gust speed (km/hr)	Date of extreme gust	Year records began	Comments
Tara Hills	98	Oct-24th	1985	4th-highest
Queenstown	109	Oct-24th	1972	2nd-highest
Gore	119	Oct-24th	1987	3rd-highest

• **Snow and ice**

On 13 September, snow warnings were issued for SH87 from Outram to Middlemarch, and SH94 from Te Anau to Milford Sound.

On 14 September, snow closed SH8 at the Lindis Pass from Tarras to Omarama, and SH73 from Arthurs Pass to Otira to towing vehicles, and chains were required by other vehicles.

Snow affected SH94 from Te Anau to Milford Sound on 15 September, with all vehicles required to carry chains. Heavy snow closed Danseys Pass, with extreme care required on roads around Poolburn, Oturehua, St Bathans and Naseby.

On 20 September, the Desert Road was closed by snow for a short time.

On 18 October, SH8 at the Lindis Pass was closed by heavy snow. Snowfall on Burkes Pass caught out several cyclists who had to be rescued and taken to Lake Tekapo. On the 19th, heavy snow fell down to about 700 m, with 80 cm settling around Lake Tekapo township.

On 5 November, snow fell over much of Southland, Otago and Banks Peninsula, an unusually late-in-the-season snowfall.

• **Lightning and hail**

On 11 September, lightning hit property and power lines in the Auckland suburbs of Te Atatu South and Avondale, cutting power to some properties.

A lightning storm swept across Wellington city on 13 September, with the accompanying marble-sized hail blanketing the ground, making some roads impassable. Several flights into Wellington were cancelled or delayed. About 900 homes in Eastbourne, Days Bay, and Evans Bay lost power for a few hours. In the Wairarapa, sleet and snow fell briefly. A separate storm brought hail to Gisborne on the same day.

On 19 September, a very-localised, intense hailstorm was reported in Renwick, with small hail covering the ground, looking like snow. Lightning disrupted some telephone and television services.

On 20 September, another hail storm struck Wellington.

On 25 September, a hail storm coated some steep Dunedin streets, creating havoc for motorists.

On both 18 and 19 October, Hawke's Bay was affected by forked lightning, affecting power supplies to the regional prison, and putting a hole into the front lawn of a property in Hastings.

On 25 October, a lightning strike hit transmission lines between Clyde and Twizel, cutting power across the Central Otago region.

On 5 November, a 20-minute hail storm in Otautau hammered cyclists on the Tour of Southland.

A thunderstorm struck Rotorua on 14 November, accompanied by heavy rain and hail. Flooding closed some roads, including SH5 at Whakarewarewa. Properties were flooded, power cut to some areas, and one building had its roof blown off during the storm. Hailstones up to 2 cm in diameter were also reported in Taupo.

For further information, please contact:

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

Tel (09) 375 4506 (office DDI), Mobile (027) 2936545

Dr James Renwick, NIWA Principal Scientist, Climate Variability & Change

Mobile (021) 178 5550, Tel (04) 386 0343 (office DDI)

www.niwa.co.nz/ncc Copyright NIWA 2011. All rights reserved.