

National Climate Summary – March 2010: Very dry in the northeast, Otago, Canterbury

- **Rainfall: Extremely dry in the north and east of the North Island, and parts of Canterbury and Otago. A record dry March for Auckland. Wet in Fiordland and parts of Southland.**
- **Soil moisture: Severe soil moisture deficits continue in Northland, Auckland, South Canterbury and Otago. Dry soils have also developed in Waikato, Coromandel, Bay of Plenty, Taupo, and parts of Gisborne and Hawke's Bay.**
- **Temperature: A much warmer than average March for Nelson, Otago, South Canterbury, and the Lakes District. A cooler than usual March for the West Coast, and from Raglan to Waiouru. Near average temperatures elsewhere.**
- **Sunshine: Extremely sunny for the east coast of the North Island, Wellington, and parts of the Central Plateau and Bay of Plenty regions.**

More frequent anticyclones ('highs') were located in the Tasman Sea during March, producing enhanced southwesterly winds over New Zealand, consistent with the El Niño which has been present since November 2009. This resulted in an extremely dry March for the north and east of the North Island, and South Canterbury and Otago. Severe soil moisture deficits continue in Northland and Auckland, South Canterbury and Otago. Significant soil moisture deficits have also developed in Waikato, Bay of Plenty, Coromandel, Taupo and parts of Gisborne and Hawke's Bay.

Well below normal March rainfall (less than 50 percent of normal) occurred in eastern Northland, Auckland, Coromandel, Waikato, Bay of Plenty, Taupo, Gisborne, Hawkes Bay, parts of South Canterbury and Otago. It was also rather dry over the remainder of the North Island and Nelson, with rainfall totals between 50 and 75 percent of normal. In comparison, it was wet in Fiordland and parts of Southland, with more than 120 percent of normal rainfall recorded. Elsewhere, March rainfalls were near normal.

March temperatures were near average (within 0.5°C of the long-term average) in many regions of New Zealand. However, Nelson, Otago, South Canterbury and the Lakes District recorded well above average temperatures (more than 1.2°C above average). The West Coast, and from Raglan to Waiouru, recorded below average temperatures (between 1.2°C and 0.5°C below average), resulting from the generally southwesterly airflow during the month. The New Zealand national average temperature was 15.9°C (0.2°C above the long-term March average).

March was an extremely sunny month for the east coast of the North Island, around Wellington, and parts of the Central Plateau and the Bay of Plenty regions, with totals above 125 percent of normal. It was also rather sunny (between 110 and 124 percent of normal sunshine) for most other regions of the North Island, as well as parts of the eastern South Island. In contrast, sunshine totals were between 75 and 90 percent of normal near Hokitika and Palmerston North.

Further Highlights:

- The highest temperature was 32.7°C, recorded at Cromwell on the 9th, and the lowest (non-alpine) temperature was -3.7 °C, recorded at Waiouru on the 18th. Both are new March records at the sites.
- The highest 1-day rainfall was 169 mm, recorded at Southwest Cape between 12 pm on the 30th and 8am on the 31st (a new all-time record at this site).
- The highest wind gust was 216.8 km/hr, recorded at Baring Head, Wellington, on the 12th (a new all-time record at this site). The highest wind gust ever recorded in New Zealand was 250 km/hr at Mt John, Canterbury on 18 April 1970.
- Of the six main centres, Auckland was the driest, Wellington the wettest, Tauranga was the warmest and sunniest, and Dunedin the coolest.

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RAINFALL: EXTREMELY DRY IN THE NORTH AND EAST OF THE NORTH ISLAND, AND PARTS OF CANTERBURY AND OTAGO. WET IN FIORDLAND AND PARTS OF SOUTHLAND.

Well below normal March rainfall (less than 50 percent of normal) occurred in eastern Northland, Auckland, Coromandel, Waikato, Bay of Plenty, Taupo, Gisborne, Hawkes Bay, parts of South Canterbury and Otago. It was a record dry March for the Auckland region (following on from a record-dry February), and near-record dry month for Whangarei and parts of: Coromandel, Waikato, the Bay of Plenty, and Hawke’s Bay. It was also rather dry over the remainder of the North Island, with rainfall totals between 50 and 75 percent of normal. In comparison, it was very wet in Fiordland and parts of Southland, with more than 120 percent of normal rainfall recorded. Elsewhere, March rainfalls were near normal.

Record or near-record low March rainfall totals were recorded at:

Location	Rainfall total (mm)	Percentage of normal	Year records began	Comments
Whangarei	8	6	1937	2nd-lowest
Warkworth	12	11	1966	Lowest
Whangaparaoa	7	9	1946	2nd-lowest
Whitianga	23	14	1961	3rd-lowest
Paeroa	13	12	1914	2nd-lowest
Matamata	19	21	1951	2nd-lowest
Tauranga	17	13	1898	4th-lowest
Te Puke	19	12	1973	2nd-lowest
Whakatane	29	27	1952	3rd-lowest
Rotorua	23	21	1963	3rd-lowest
Auckland (Airport)	8	9	1959	Lowest*
Pukekohe	14	14	1944	Lowest
Hamilton (Ruakura)	15	17	1905	4th-lowest
Te Kuiti	20	19	1950	2nd-lowest
Turangi	15	12	1968	2nd-lowest
Waipawa	6	8	1945	Lowest
Hawera	28	30	1977	3rd-lowest
Takaka	43	29	1976	4th-lowest

*1 hour missing in the record

TEMPERATURES:

March temperatures were near average (within 0.5°C of the long-term average) in many regions of New Zealand. However, Nelson, Otago, South Canterbury and the Lakes District recorded well above average temperatures (more than 1.2°C above average). It was a record warm March at Whangaparaoa, Whakatane, and Cheviot, and near-record warm at several sites in Nelson, Canterbury, and Otago. In contrast, the West Coast, and from Raglan to Waiouru, recorded below average temperatures (between 1.2°C and 0.5°C below average). The New Zealand national average temperature was 15.9°C (0.2°C above the long-term March average).

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

Location	Mean maximum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Whangaparaoa	23.6	2.1	1982	Highest

Whakatane	24.5	1.6	1974	Highest
Takaka	22.9	1.9	1978	2nd-highest
Motueka	23.2	1.8	1956	2nd-highest
Nelson	22.2	1.5	1943	2nd-highest
Appleby	23.4	2.6	1943	Highest
Lake Tekapo	21.4	2.6	1927	3rd-highest
Cheviot	23.1	2.4	1982	Highest
Christchurch (Airport)	22.2	2.1	1863	2nd-highest
Dunedin (Airport)	20.7	1.8	1947	3rd-highest
Cromwell	23.6	2.4	1949	3rd-highest
Tara Hills	22.4	2.4	1949	2nd-highest
Cape Campbell	18.4	-1.9	1953	4th lowest

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

Location	Mean minimum air temperature (°C)	Departure from normal (°C)	Year records began	Comments
Turangi	7.4	-2.4	1968	4th-lowest
Appleby	9.2	-2.4	1943	4th-lowest

SUNSHINE: EXTREMELY SUNNY IN THE EAST OF THE NORTH ISLAND

March was an extremely sunny month for the east coast of the North Island, around Wellington, and parts of the Central Plateau and the Bay of Plenty regions, with totals above 125 percent of normal. It was also rather sunny (between 110 and 124 percent of normal sunshine) for most other regions of the North Island, as well as parts of the eastern South Island. In contrast, sunshine totals between 75 and 90 percent of normal near Hokitika and Palmerston North.

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

Location	Sunshine (hours)	Percentage Of normal	Year records began	Comments
Turangi	236	136	1976	2nd-highest
Martinborough	242	129	1986	Highest
Waipawa	229	137	1945	3rd-highest
Wellington, Kelburn	245	128	1928	4th-highest
Stratford	231	131	1963	2nd-highest
Blenheim	262	122	1947	2nd-highest

MARCH CLIMATE IN THE SIX MAIN CENTRES

Of the six main centres, Auckland was the driest, Wellington the wettest, Tauranga was the warmest and sunniest, and Dunedin the coolest. It was a very dry month for all of the six main centres. It was the driest March ever recorded in Auckland, and also extremely dry in Tauranga and Hamilton, with rainfalls less than a quarter of the March normal. It was a very warm March for Tauranga and Dunedin, somewhat cool for Auckland, and close to normal for Hamilton, Wellington, and Christchurch.

March 2010 main centre climate statistics:

Location	Mean temp. (°C)	Departure from normal (°C)		Rainfall (mm)	% of normal		Sunshine (hours)	% of normal	
Auckland ^a	18.0	-0.6	Below average	13	15%	Driest on record	198	107%	Near normal

Tauranga ^b	19.0	+1.1	Above average	17	13%	4 th lowest since 1898	260	132%	Well above normal
Hamilton ^c	16.8	-0.1	Near average	20	22%	4 th lowest since 1935	206	111%	Above normal
Wellington ^d	16.0	+0.2	Near average	50	55%	Below normal	245	128%	4 th highest since 1928
Christchurch ^e	15.4	+0.3	Near average	22	40%	Well below normal	195	107%	Near normal
Dunedin ^f	15.0	+1.2	Well above average	23	33%	Well below normal	152	109%	Near normal

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

HIGHLIGHTS AND EXTREME EVENTS

• Heavy rain and flooding

The highest 1-day rainfall in March was 169 mm, recorded at Southwest Cape between 12 pm on the 30th and 8am on the 31st (both a new March and all-time record at this site since this station opened in 1991). Wanganui recorded its highest March daily rainfall total, 27 mm, since records began there in 1987.

Heavy rain on 22 March caused slips in Fiordland, closing the Milford Sound Road. About 200 trampers were stranded in huts on the Kepler, Milford, and Routeburn tracks after landslides blocked the tracks.

Surface flooding and thunderstorms were reported on the Kapiti Coast, north of Wellington, on 24 March.

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	27	22nd	1987	Highest

• Temperature

The highest temperature recorded in March 2010 was 32.7°C, observed at Cromwell on the 9th. This is a new March record at this site. The lowest (non-alpine) temperature was -3.7 °C, recorded at Waiouru on the 18th (also a March record).

The storm on 12 March caused plunging temperatures in Wellington and Kaikoura. MetService reported Wellington Kelburn temperatures plummeted from 18.5 °C to 8.5 °C within ten minutes, with a similar drop recorded at Wellington Airport.

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

Location	Extreme maximum temperature (°C)	Date of extreme temperature	Year Records began	Comments
Kaikohe	26.5	28th	1973	Equal 3rd-highest
Leigh	26.6	20th	1966	2nd-highest
Whangaparaoa	27.0	5th	1982	Highest
Whakatane	28.3	11th	1975	3rd-highest
Auckland	27.4	1st	1959	3rd-highest
Takaka	27.7	19th	1978	4th-highest
Motueka	28.2	26th	1956	4th-highest
Appleby	27.8	15th	1943	3rd-highest
Arthurs Pass	25.8	8th	1973	4th-highest

Mt Cook	28.4	15th	1929	Equal 4th-highest
Le Bons Bay	27.1	14th	1984	2nd-highest
Wanaka	30.0	8th	1955	2nd-highest
Cromwell	32.7	9th	1949	Highest
Alexandra	32.0	9th	1983	4th-highest
Port Taharoa	17.8	18th	1974	4th-lowest
Castlepoint	12.1	17th	1972	2nd-lowest
Hokitika	12.0	24th	1964	2nd-lowest
Greymouth	12.5	24th	1972	2nd-lowest
Haast	12.8	25th	1949	Equal 4th-lowest
Arthurs Pass	5.0	9th	1978	2nd-lowest
Arthurs Pass	7.2	24th	1973	4th-lowest
Le Bons Bay	10.4	17th	1984	2nd-lowest

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

Location	Extreme minimum temperature (°C)	Date of extreme temperature	Year Records began	Comments
Whangaparaoa	10.6	18th	1982	3rd-lowest
Taupo	-1.2	18th	1949	2nd-lowest
Hamilton	-0.3	18th	1946	2nd-lowest
Port Taharoa	5.4	18th	1973	Lowest
Te Kuiti	0.0	18th	1959	Lowest
Taumarunui	-2.8	18th	1947	Lowest
Turangi	-2.1	18th	1968	Lowest
Martinborough	1.1	18th	1986	Lowest
Paraparaumu	2.0	18th	1953	4th-lowest
Hawera	0.3	18th	1977	Lowest
Ohakune	-1.0	18th	1962	4th-lowest
Waiouru	-3.7	18th	1962	Lowest
Wanganui	4.1	18th	1937	Equal 4th-lowest
Kaikoura	3.5	13th	1963	Lowest
Arthurs Pass	-9.0	23rd	1978	Lowest
Cheviot	-1.5	18th	1982	2nd-lowest
Puysegur Point	16.2	31st	1978	Equal 4th-highest
Cheviot	18.4	22nd	1982	Highest
Le Bons Bay	17.0	27th	1984	Equal 4th-highest
Tara Hills	16.6	27th	1949	Equal 2nd-highest
Cromwell	19.3	31st	1949	2nd-highest

- **High winds and tornadoes**

The highest wind gust was 217 km/hr, recorded at Baring Head, Wellington, on the 12th (a new all-time record at this site, although the record only extends back to 1991). Milford Sound recorded 141 km/hr wind gusts on March 22nd, a new March record since measurements began there in 1974. Note; the highest wind gust ever recorded in New Zealand was 250 km/hr at Mt John, Canterbury on 18 April 1970.

On 12 March a southerly storm moved up the east coast, with gale force winds in Wellington and Kaikoura. Trees fell across rail lines, blocking the Hutt Valley line north of Waterloo station, and damaging the overhead power and signalling. Fallen trees also blocked Paekakariki Hill Road. Trains and flights in and out of Wellington were disrupted, and a tug was used to manoeuvre the Cook Strait ferries in Wellington harbour. Power lines were blown down from Island Bay to Upper Hutt, and across to Paekakariki. Falling trees injured people in Carterton, and Rarangi near Blenheim. The course was shortened in an annual fundraising sailing race by the Royal Port Nicholson Yacht Club. Of the 13 keel boats taking part, three needed to be towed to shore, and three had to wait out the storm. One person fell overboard but was quickly rescued. Roofs were blown off buildings at St Bernard's College in Lower Hutt, and Samuel Marsden

College in Wellington, and Time Cinema in Lyall Bay. Further south, Stewart Island Flights had to put on three extra flights, because all ferry sailings from Bluff to Oban were cancelled.

On 22 March, severe gales disrupted flights in and out of Wellington Airport, and brought down trees and phone lines. Two Cook Strait ferry sailings were cancelled, and the Eastbourne ferry service between Queens Wharf and Days Bay was also cancelled. At the Basin Reserve, during the cricket test match against Australia, the wind was strong enough to blow a pitch roller along the ground, along with several workers, when they attempted to remove a pitch cover.

On 24 March, gale force winds and heavy rain battered Wellington, delaying flights and damaging windows, roofs and power lines. A tornado was reported at Rutherglen, near Greymouth, felling trees and damaging property.

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

Location	Extreme wind gust speed (km/hr)	Date of extreme gust	Year Records Began	Comments
Baring Head	217	12th	1991	Highest
Farewell Spit	89	12th	1973	Equal 3rd-highest
Milford Sound	141	22nd	1974	Highest
Christchurch	98	22nd	1972	2nd-highest
Tara Hills (Central Otago)	85	22nd	1985	2nd-highest

• **Lightning and Hail**

On 12 March, hail was reported in Culverden, North Canterbury, and Ward in Marlborough.

A thunderstorm struck Fiordland and Otago on 22 March. In the Queenstown Lakes region it blew up lightning protection arrestors, cutting electricity supply for about five hours in some areas.

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