

CLIMATOLOGICAL TABLE—Summary of the Records of Temperature, Rainfall, and Sunshine for July 1977—continued
LATE RETURNS AND CORRECTIONS—continued

Station	Height of Station Above M.S.L.	Air Temperatures in Degrees (Celsius)								Rainfall (in millimetres)				Bright Sunshine Hrs	
		Means of		Mean of A and B	Difference From Normal	Absolute Maximum and Minimum				Total Fall	No. of Rain Days	Difference From Normal	Maximum Fall		
		A Max.	B Min.			Maximum	Date	Minimum	Date				Amount		Date
Metres	°C	°C	°C	°C	°C		°C	°C	mm		mm	mm			
Taieri, Invermay, June 1977	30	9.3	0.9	5.1	..	14.9	14	-2.5	11	86	17	..	28	28	..
Ophir, June 1977	305	7.4	-3.6	1.9	-0.4	14.9	30	-8.9	19	20	8	-5	4	28	..
Moa Creek, June 1977	427	7.9	-4.4	1.8	+0.2	..	..	..	..	13	..	-10	4	28	..
Mahinerangi Dam, June 1977	396	7.4	..	..	..	13.1	14	..	..	60	14	-19	22	4	..
Totokoitu, Rarotonga, June 1977	9	24.8	19.6	22.2	..	26.8	22	16.6	30	65	16	..	20	24	..

The 'normal' refers to the present site of the instruments.

Standard period for normals is 1941-1970.

No normals are available for stations with only short records.

*Indicates that the sunshine recorder is not located at the station but is in the near vicinity.

A rain day is a day with rainfall equal to or greater than 0.1 mm.

Where the extremes of temperature and rainfall have occurred more than once during the month, the date of the first occurrence is given.

NOTES ON THE WEATHER FOR JULY 1977

General—During July pressures were near normal in the North Island and on the West Coast, but considerably higher than normal at Campbell Island. There was a marked absence of westerly winds, and for the second month in succession a predominance of winds from an easterly quarter. Apart from southerly gales on the 3rd and 4th winds were unusually light throughout the month. This was a cloudy month over most of the country, especially on the east coast of the South Island. Gales and rain on the 3rd and 4th caused severe flooding in the Christchurch and Banks Peninsula areas, and many transport services were disrupted throughout New Zealand. Thick fog over most of the country on the morning of the 14th and 15th closed the major airports throughout New Zealand. Farmers reported that wet conditions and lack of sunshine at the beginning of the month had retarded grass growth in some areas, but growth improved towards the end of the month. The only areas with dry ground conditions were parts of Westland, Fiordland, Central Otago, and Southland.

Rainfall—Rainfall was above normal over the northern half of the North Island, Manawatu, southern Wairarapa, Wellington, and the east coast of the South Island. Some stations in Fiordland and Central Otago were below normal by as much as 75 percent. Heavy rain in the Christchurch area on the 3rd and 4th caused widespread flooding and many land slips, closing roads and isolating many areas especially in Banks Peninsula. Nearly 49 mm was recorded at Christchurch Airport in 12 hours and the 24 hour total to 9 a.m. on the 4th was 77 mm. The total fall for the month at the airport was nearly 200 percent above normal, and in Christchurch City more than 250 percent above. Heavy rain on the 19th, 20th, and 21st caused flooding in many areas of the North Island. The Coromandel Peninsula, Northland, Hauraki Plains, and the Gisborne area were the worst affected. Coromandel rainfall station recorded 175 mm in 48 hours, and the following 24 hour totals were recorded in other parts of the North Island: Whangarei 141 mm, Waihi 120 mm, Thames 99 mm and Rotorua 82 mm.

Temperatures—Mean temperatures were above normal over most of New Zealand, in Bay of Plenty, Nelson, and Central Otago by more than 1°C. A few isolated areas in both islands were below normal, but none by as much as ½°C. The coldest spell was the 3rd and 4th with a cold southerly airstream over the country.

Sunshine—This was a cloudy month over the whole of New Zealand with the exception of parts of southern Hawke's Bay, Buller, and Westland. Christchurch, Ashburton, Timaru, and Dunedin recorded their lowest sunshine hours for any month since recordings started. These stations were below their normal monthly total by as much as 60 hours.

Weather sequence—A depression near Tasmania, which had begun to move slowly east towards New Zealand at the end of June, continued to move east and was lying to the west of the country on the 1st. An anticyclone to the north-east of the North Island, ahead of the depression, moved slowly east also, and the northerly flow between these two systems brought warm temperatures to the whole of New Zealand. Early on the 2nd the depression, and associated cold fronts moved onto the South Island, and later in the day were lying to the east of the country. Rain was reported over the whole of New Zealand with heavy falls in the Coromandel, Bay of Plenty and on the West Coast. Temperatures continued warm on the east coast of the North Island. A ridge of high pressure extended from Australia to the south of the country.

The depression became almost stationary near the Chatham Islands, and a strong pressure gradient was established between the depression and the ridge of high pressure. By the 3rd a strong southerly flow covered New Zealand and gales were reported in many areas, especially in Wellington and Canterbury. The strong southerly flow persisted for two days, and during this period rain was reported over most of New Zealand, with heavy falls in the Wellington region, Wairarapa and coastal Canterbury. More than 75 mm was recorded in 24 hours at Christchurch and in Banks Peninsula, and extensive damage was caused by flooding in these areas. Temperatures were cold over the whole country except for parts of Westland and Buller. Late on the 4th a ridge of high pressure was situated across the whole of New Zealand and the depression had moved slowly eastwards. Pressures were low to the south of the country and a cold front passed across both islands on the 5th bringing rain to Wairarapa, Hawke's Bay, Poverty Bay and Canterbury.

On the 6th, 7th, and 8th a ridge of high pressure was established over the whole country and extended to the south of New Zealand. Small disturbances in the southerly flow ahead of this ridge brought isolated showers to both islands. Early on the 9th a small depression formed to the west of the South Island and moved slowly east across the country. A cold front associated with this depression passed northwards onto the North Island, and rain was reported in most of the South Island and Northland. Pressures remained high over the Tasman Sea and to the east of the country, with lower pressures near Campbell Island. A small depression formed on a cold front to the west of the North Island and crossed the country on the 10th and 11th. The anticyclone in the Tasman Sea continued to move eastwards and later on the 11th covered the whole of New Zealand. Another anticyclone was situated over the Australian continent. Between these two high pressure cells a trough of low pressure developed and moved eastwards on the 12th. A cold front lying in this trough moved onto the South Island late on the 12th, and a small wave depression formed on the front to the north, but filled rapidly early on the 13th.

By the 14th the anticyclone over New Zealand had weakened and was moving to the east. Pressures were low near Tasmania, but still high over Australia. Thick fog was reported in many parts of New Zealand on the morning of the 14th and again on the 15th. The low pressure area near Tasmania had developed into a complex depression by the 15th, and had begun to move slowly north-east into the Tasman Sea. The ridge of high pressure over New Zealand still persisted on the 16th and the morning of the 17th. The depression in the Tasman Sea had developed three separate low pressure centres and continued to move onto the country.

By the evening of the 17th a cold front associated with the depression to the west of the country had moved onto New Zealand, with the anticyclone to the east moving away. Rain was reported on the West Coast and in Northland. As this depression moved slowly across the country from the 18th to the 22nd heavy rain was recorded in many areas of both islands. On the 19th heavy rain in the North Island caused major flooding in Northland, Auckland, and on the Coromandel Peninsula. Some stations in these areas recorded more than 100 mm in the 24 hours up to 9 a.m. on the 20th. Heavy falls were also recorded in Bay of Plenty, Poverty Bay, Wairarapa, Taranaki, Wellington, Marlborough, Canterbury, and the Kaikoura coast. Floods were also reported in Northland and the Gisborne area.

During the evening of the 22nd the depression had moved to the east, away from the country, and an anticyclone had become established in the north Tasman Sea. Pressures were low to the