

CLIMATOLOGICAL TABLE—Summary of the Records of Temperature, Rainfall, and Sunshine for September 1969—continued

Station	Height of Station Above M.S.L.	Air Temperatures in Degrees (Fahrenheit)								Rainfall in Inches					Bright Sunshine
		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	
	Ft.	°F.	°F.	°F.		°F.	°F.			In.			In.		Hrs.
Rarotonga .. ..	15	77.2	64.5	70.8	-0.6	82.6	28	53.5	14	7.49	16	+3.0	2.00	1	173
Raoul Island .. ..	126	66.2	57.3	61.8	+0.5	70.4	28	51.3	22,23	6.73	16	+2.4	2.23	13	157
Chatham Islands .. ..	157	55.2	47.2	51.2	+3.0	58.2	29	38.2	25	2.66	13	+0.2	1.03	15	121
Campbell Island .. ..	49	47.8	39.2	43.5	..	52.4	23	31.2	26	4.30	24	..	0.79	16	60
Scott Base, Antarctica .. ..	45	..	..	-5.8	..	10.6	30	-49.9	25	..	..	..	..	..	..
Lake Vanda, Antarctica .. ..	51	-16.1	-37.8	-27.0	..	21.7	30	-50.8	18	..	..	..	..	..	..
LATE RETURNS															
Lower Retaruke .. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kaitoke .. ..	625	52.0	37.0	44.5	..	60.0	7	25.0	12	3.03	16	..	1.79	9	95
Erratum															
Kawaka Forest .. ..	..	..	..	..	..	..	..	..	..	3.92	8	..	2.37	17	..

The "normal" refers to the present site of the instruments. The standard periods for normals are: for temperature 1931-60, for rainfall 1921-59 and for sunshine 1935-60. No normals are available for stations with only short records.

\*The sunshine recorder is not located at the station but is in the near vicinity.

NOTES ON THE WEATHER FOR SEPTEMBER 1969

**General**—September was marked by an exceptionally high frequency of northerly winds. It was unusually warm and also rather cloudy, with excessive rain on the West Coast. Over most of the country the mild conditions with reasonably adequate moisture were very favourable for farming, and growth was reported to be very good for the time of the year. Conditions were particularly good for lambing. However, in some eastern districts of both Islands more rain was needed. In the drought-stricken areas of South Canterbury and North Otago the rain gave some relief but the ground was still too dry.

No less than nine small local tornadoes caused some damage in parts of Northland, Auckland, Coromandel, and Bay of Plenty on the 13th, 15th, and 16th.

**Rainfall**—Rainfall was above average north of a line through Egmont, Ruapehu, and Lake Waikaremoana. It was also above normal in the South Island, except for the Canterbury Plains and coast and parts of Otago and Southland. It was two to four times the average value in Bay of Plenty and in Nelson and parts of Marlborough. A similar excess was recorded in Buller, Westland, and the Alps, with many totals of over 30 in., including 34.24 in. at Otira, 48.41 in. at Fox Glacier, and 51.18 in. at Paringa (South Westland). The highest monthly total was 65.69 in. at Downertown, an opencast coal mine north-east of Westport at an altitude of 2,600 ft above sea level. Of this amount, 44.72 in. fell in the 5 days 4-8 September, and 63.15 in. during the 15 days 3-17 September. Extensive slips blocked many roads on the 8th, especially the passes over the Alps.

Over the remainder of the country rainfall was below average. It was less than half the average value in Taihape and Wairarapa with parts of Manawatu and Hawke's Bay; also in North Canterbury and parts of Central Canterbury. Over most of North Canterbury it was less than a quarter of the average value.

**Temperatures**—Temperatures were 1-5 degrees warmer than average. Highest departures, of 3-5 degrees, were recorded from South Taranaki and Taihape to Wellington and Wairarapa; also in Marlborough and Canterbury with parts of Otago and Southland. In parts of these areas, notably the cities of Wellington and Christchurch, it was by far the warmest September in 60-100 years of observation.

**Sunshine**—Sunshine was below average by 30-70 hours over the greater part of the country, Hokitika receiving only 98 hours. However, it was about average over most of Southland, Otago, and inland Canterbury; also in the North Island east of the main ranges, in the Taihape-Wanganui-Manawatu area, and in parts of Waikato, Bay of Plenty, and Northland.

**Weather Sequence**—On 1 September an anticyclone was centred to the west of the North Island and the weather was fine. During the next 2 days the anticyclone moved eastward and a complex trough of low pressure moved on the South Island. Considerable rain soon developed in Fiordland and later spread to other parts of the West Coast. On the 4th and 5th the trough became stationary over Buller and Canterbury and a depression formed over the Tasman Sea. Rain persisted over most of the West Coast and also spread to Nelson and the Cook Strait area, besides the Southland coast.

The depression over the North Tasman Sea moved very slowly eastward from the 6th to the 9th, while the trough remained stationary over the northern part of the South Island and an anticyclone was centred near the Chatham Islands. This was the first of a number of periods of northerly weather; and during this period excessive rain affected the West Coast, especially on the 7th; with some rain later extending also to the greater part of the South Island and to northern districts of the North Island. Extensive slips blocked the passes over the Alps at times. On the 10th a depression moved on to the South Island and the trough of low pressure finally crossed the country. The heavy rain persisted on the West Coast but spread also to Bay of Plenty and Nelson, with flooding in Collingwood, north-west Nelson. Considerable rain also spread to other parts of the North Island and Marlborough. The anticyclone remained centred far to the east and the spell of northerlies still persisted from the 11th to the 13th. A trough of low pressure associated with a very deep depression far to the south crossed the country, and a small secondary centre formed over Southland. Rain continued on the West Coast, in northern and western districts of the North Island, and in Southland, with scattered falls extending to other areas.

On the 14th a weak ridge of high pressure brought a brief temporary improvement for most districts. On the following day northerlies set in once again as a deep depression west of the South Island moved slowly north-eastward and the associated trough of low pressure crossed the country. Rain was fairly general, except east of the ranges south of Christchurch. On the 16th a second depression passed far to the south and rain was confined mainly to western districts of both Islands. During the next 2 days, the depression which had been situated west of the South Island moved across the North Island and a brief southerly change occurred. Rain was fairly general but the falls were mainly light, except at times on the West Coast.

From the 19th to the 21st an anticyclone passed to the north of the North Island and a deep depression moved eastward far to the south. These three days were marked by westerly conditions, with rain on the West Coast, in Southland, and in some western districts of the North Island. During the next 2 days an anticyclone centred east of Cook Strait brought fine weather to the whole country.

A depression west of Northland moved slowly eastward during the 24th and 25th and a second centre developed to the south. An anticyclone remained centred near the Chatham Islands and moist north-easterlies covered the North Island. Heavy rain was reported in the Bay of Plenty and some rain also affected the remainder of the North Island and parts of the South Island. On the following day the depression was still centred near North Cape, and easterly winds brought rain especially to the East Coast ranges, besides lighter falls in Bay of Plenty, Waikato, Hawke's Bay, and also the North Canterbury Coast. By the 27th the depression had become rather weak but some rain still persisted in Gisborne and on the east coast of Northland.

On the 28th a weak trough of low pressure affected mainly South Canterbury, Marlborough, and Nelson. The last 2 days of the month were marked by mainly fair weather under the influence of a belt of high pressure. However, a weak trough brought some rain to northern Hawke's Bay and Gisborne.

J. F. GABITES, Director.