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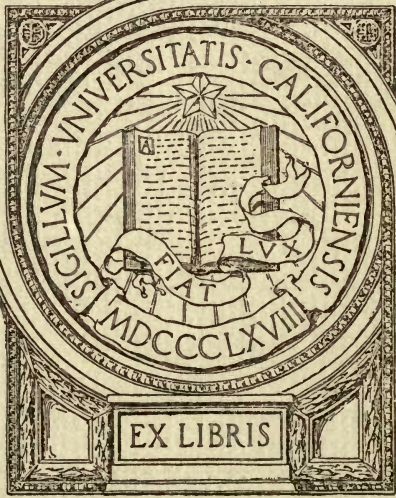
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CLIMATE AND METEOROLOGY

OF

NEW ZEALAND.

D.C. Bates
"



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August 1900

CLIMATE AND METEOROLOGY OF NEW ZEALAND.

(Prepared by Lieut.-Colonel D. C. BATES, Dominion Meteorologist,
for publication in the "New Zealand Official Year-book.")

THE climate of New Zealand is spoken of in popular and general terms as equable, mild, and salubrious; but such a summary does not convey an adequate idea of variations that exist in a country stretching, as it does, north and south for nearly a thousand miles, and distinctly differentiated by lofty mountain-chains. Another fact which must also be borne in mind is that the greater part of the North Island is controlled by a different system of circulation from that which dominates conditions in the parts about Cook Strait and the South Island. The former is subject to ex-tropical disturbances, and the latter more to westerly or antarctic "lows," which travel along the latitudes of the "forties," with their prevailing westerly winds.

The climate of the Auckland Province, speaking generally, combines degrees of warmth and humidity agreeable by day and comfortable by night. North of Auckland City conditions are almost subtropical, and in summer balmy easterly breezes prevail, and are responsible for delightful conditions. In winter the winds are more north and west, while changes to the south-west or south-east mostly account for the rainfall. Cumulus clouds are frequently formed in the afternoons, and, while tempering the heat of the day, also cut down sunshine records somewhat, but add considerably to the beauty of land- and sea-scape. Southward of Auckland the climate is more varied, the west coast experiencing more rain, while the central parts are warmer in the day and considerably colder at night. In the winter months frosts, which are unknown farther north, now and then occur in the hours of darkness. Eastward from Rotorua (the great health resort and centre of the thermal region) is to be found one of the most genial climates in the world, and Tauranga and Opotiki have charms all their own, especially for their weather and the fruits which ripen to perfection in these regions.

The monthly and annual means of the temperature, rainfall, and sunshine of Auckland are shown in the following table:—

Month.	Mean Temperatures for 56 Years.			Mean Rainfall for 67 Years.		Mean Sunshine for 10 Years.
	Maximum.	Minimum.	Mean.	Inches.	Days.	Hr. min.
January ..	73·7	58·9	66·5	2·54	10·3	217 25
February ..	74·3	59·6	67·1	2·96	9·6	176 37
March ..	72·0	57·7	65·0	3·02	11·1	171 58
April ..	67·8	54·6	61·2	3·30	13·9	139 8
May ..	62·7	50·5	56·7	4·45	18·3	129 17
June ..	59·2	47·8	53·5	4·72	19·4	113 45
July ..	57·6	46·0	51·8	5·15	21·0	114 57
August ..	58·2	46·0	52·2	4·24	19·6	137 11
September ..	60·7	48·4	54·7	3·61	17·6	136 48
October ..	63·5	50·7	57·3	3·60	16·4	159 42
November ..	67·0	53·3	60·2	3·28	14·6	184 23
December ..	70·9	56·7	63·9	2·80	11·5	213 52
Year ..	65·6	52·5	59·2	43·67	183·3	1,895 3

- ROTORUA.

Month.	Mean Temperatures for 32 Years.			Mean Rainfall for 34 Years.		Mean Sunshine for 8 Years.
	Maximum.	Minimum.	Mean.	Inches.	Days.	Hr. min.
January ..	75.5	52.3	63.9	3.95	9.5	253 39
February ..	74.9	52.2	63.4	3.83	8.7	190 59
March ..	71.8	49.4	60.6	3.68	9.7	191 24
April ..	66.0	45.4	55.6	4.26	10.8	160 23
May ..	60.0	40.7	50.3	5.52	12.5	141 41
June ..	55.6	38.2	46.8	4.86	12.9	119 40
July ..	54.2	37.0	45.5	5.29	14.1	127 14
August ..	56.1	37.5	46.7	5.01	13.4	148 15
September ..	59.6	40.8	50.2	5.14	14.4	156 5
October ..	63.9	44.0	54.0	4.89	14.1	187 5
November ..	68.3	46.7	57.5	4.09	12.8	213 44
December ..	72.8	49.6	61.1	3.63	9.7	228 28
Year ..	64.9	44.5	54.6	54.15	142.6	2,118 37

The Hawke's Bay Province is one of the richest in New Zealand, and is favoured with a pleasant climate, being sheltered from westerly winds, though occasionally they are of the warm and dry (Foehn) type. It is rather dry, but ex-tropical disturbances are occasionally responsible for heavy downpours. Though the number of "days with rain" is less, and sunshine above that of other parts, the rainfall is still a good one, and fairly regular throughout the year, though some seasons have been notably dry. The meteorological records of Napier show reliable normals for the coastal districts. Inland the country is rather mountainous and less mild.

Month.	Mean Temperatures for 29 Years.			Mean Rainfall for 15 Years.		Mean Sunshine for 13 Years.
	Maximum.	Minimum.	Mean.	Inches.	Days.	Hr. min.
January ..	75.9	57.0	66.4	1.64	6.4	281 5
February ..	74.5	56.7	65.6	2.47	6.4	212 56
March ..	71.2	54.7	63.0	3.86	9.3	211 49
April ..	67.2	50.4	58.7	2.58	7.9	195 27
May ..	61.7	46.3	54.0	4.42	9.7	159 20
June ..	58.0	42.3	50.1	2.59	7.9	165 40
July ..	56.5	41.6	49.0	3.95	10.8	149 27
August ..	57.9	42.1	50.0	3.13	10.8	187 14
September ..	62.3	45.2	53.7	1.83	8.3	220 11
October ..	66.4	48.7	57.5	2.44	9.1	235 38
November ..	69.6	51.8	60.7	2.17	8.4	245 42
December ..	73.1	55.3	64.2	2.07	7.1	275 38
Year ..	66.2	49.3	57.7	33.15	102.1	2,540 7

Wellington, the Capital City, as disclosed by its meteorological records, has a mean climate for the whole Dominion. Wellington occupies a central position, and is situated near Cook Strait, which divides the two main Islands. It has a somewhat changeable but temperate climate, and, though occasionally subject to disturbances from warmer regions, is usually controlled by the terrestrial wind-currents which have a westerly direction round the world in the latitude of the "forties." It is popularly regarded as a rather windy spot, for high winds are frequently experienced, although they hardly ever reach hurricane force. Its windiness is largely owing to local configuration, for places quite near Wellington experience very little wind; and to compensate for this rather disagreeable element is a bountiful sunshine, averaging 2,038 hours per annum. There is a plentiful rainfall, amounting to nearly 50 in.

Between Wellington and Taranaki, following the Taranaki Bight, is probably one of the most fertile and agreeable regions in Australasia; but inland, though very productive, conditions are not so favourable.

Taranaki has a rather heavy rainfall, and in most parts of this region the grass is always green. Its climate is mild, and cattle winter in the open. Wanganui and Palmerston North districts (which lie between Wellington and Taranaki) have less rainfall than either Wellington or Taranaki, and have advantages over other parts of both Wellington and Taranaki.

The climatic means for Wellington are as follow:—

Month.	Mean Temperatures for 56 Years.			Mean Rainfall for 58 Years.		Mean Sunshine for 13 Years.
	Maximum.	Minimum.	Mean.	Inches.	Days.	Hr. min.
January ..	° F. 69·4	° F. 55·8	° F. 62·5	3·28	10·4	232 30
February ..	69·2	55·7	62·5	3·23	9·1	208 50
March ..	66·8	54·2	60·5	3·29	11·7	176 37
April ..	62·8	51·3	57·0	3·89	13·2	153 58
May ..	58·3	47·3	52·8	4·81	16·7	130 50
June ..	54·7	44·3	49·5	4·93	17·3	103 39
July ..	53·1	42·3	47·7	5·81	18·4	101 31
August ..	54·4	42·8	48·6	4·46	17·0	142 2
September ..	57·4	45·7	51·6	4·09	15·2	161 29
October ..	60·3	48·3	54·3	4·13	14·1	178 32
November ..	63·4	50·4	56·9	3·48	12·8	207 3
December ..	66·9	53·8	60·3	3·21	12·1	240 55
Year ..	61·4	49·3	55·3	48·61	168·0	2,037 55

It may be useful to make a comparison between the records of Wellington and those of Camden Square, London.

CAMDEN SQUARE, LONDON.

Month.	Mean Temperatures for 35 Years.		
	Maximum.	Minimum.	Mean.
	° F.	° F.	° F.
January	43·5	34·0	38·8
February	45·6	34·4	40·0
March	50·1	35·6	42·9
April	57·4	39·4	48·4
May	64·9	45·2	55·1
June	70·9	51·0	61·0
July	74·1	54·4	64·3
August	72·6	53·7	63·2
September	67·4	49·8	58·6
October	57·5	43·9	50·7
November	49·7	38·9	44·3
December	45·1	35·8	40·5
Year	58·2	43·0	50·6

MOUMAHAKI.

Month.	Mean Temperatures for 14 Years.			Mean Rainfall for 15 Years.	Mean Sunshine for 13 Years.	
	Maximum.	Minimum.	Mean.			
	° F.	° F.	° F.	Inches.	Days.	Hr. min.
January ..	70·0	53·3	61·6	3·03	9·5	236 12
February ..	70·8	53·3	62·1	2·79	8·0	186 58
March ..	69·6	52·4	61·0	3·85	9·1	179 35
April ..	64·4	48·2	56·3	3·94	13·1	152 53
May ..	59·1	44·1	51·6	4·17	14·0	121 22
June ..	55·1	42·5	48·8	4·39	15·2	99 53
July ..	53·7	40·9	47·3	4·27	16·9	106 54
August ..	55·5	41·8	48·7	3·67	14·6	138 51
September ..	58·8	44·8	51·8	4·04	14·2	150 5
October ..	61·8	47·0	54·3	4·41	15·0	163 21
November ..	64·6	49·1	56·8	3·61	12·8	168 42
December ..	68·2	50·9	59·5	3·59	12·1	231 12
Year ..	62·6	47·4	55·0	45·76	154·5	1,935 58

Nelson and Marlborough are highly favoured regions with regard to sunshine and shelter from marine winds. Long ago Bishop Selwyn said, "No one knows what the climate is till he has basked in the almost perpetual sunshine of Tasman's Gulf, with a frame braced and invigorated to the full enjoyment of heat by the wholesome frost or cool snowy breeze of the night before."

Pastoral and agricultural industries are thriving, and the Province of Nelson is also famous for its fruit cultures—apples especially being celebrated for their variety, colour, and flavour. The rainfall about Nelson is very reliable, and averages from 35 in. to 45 in. per annum. Marlborough is also a sunny province, and its rainfall averages from 25 in. to 30 in.

The records for Nelson are as follow:—

Month.	Mean Temperatures for 31 Years.			Mean Rainfall for 37 Years.	
	Maximum.	Minimum.	Mean.	Inches.	Days.
January	° F. 75·5	° F. 53·8	° F. 64·6	2·66	7·9
February	74·6	53·9	64·1	2·68	6·6
March	71·4	51·4	61·3	2·99	8·9
April	66·5	47·4	57·0	2·87	9·6
May	60·3	42·5	51·3	3·20	10·0
June	56·2	38·9	47·5	3·82	10·1
July	54·7	37·7	46·2	3·61	11·2
August	56·7	38·6	47·6	3·01	10·5
September	60·8	42·4	51·5	3·70	12·2
October	64·9	45·0	55·0	3·24	11·9
November.. ..	69·0	48·4	58·7	2·91	11·3
December	72·0	51·4	61·8	2·68	8·8
Year	65·2	45·9	55·6	37·37	119·0

The climate of Westland is influenced by its position with regard to the prevailing westerly winds, its proximity to the sea from which these winds blow, and the mountainous character of its eastern half. The rainfall, as might be expected, is heavy, and ranges from about 70 in. per annum in the north on the coast to as much as 200 in. in the mountainous country. The weather-changes are chiefly due to atmospheric depressions, with lowest pressures passing south of the Dominion. Cyclones centred in the north, while bringing heavy rains to the North Island and the east coast portions of the South, do not, as a rule, affect Westland, as easterly winds, which then prevail, are not conducive to cloud-formation in this province. Sunshine averages 1,858 hours a year, and, though not so abundant as in east coast districts, is a good average amount considering the rainfall. Westland is noted for a clear, beautiful atmosphere during fair-weather periods.

HOKITIKA.

Month.	Mean Temperatures for 34 Years.			Mean Rainfall for 40 Years.		Mean Sunshine for 7 Years.
	Maximum.	Minimum.	Mean.	Inches.	Days.	Hr. min.
January	° F. 67·9	° F. 53·7	° F. 60·8	9·92	12·2	189 27
February	68·4	53·3	60·8	7·54	11·0	174 29
March	66·2	51·3	58·7	9·85	13·7	176 38
April	62·7	47·2	54·9	8·94	14·9	131 10
May	58·3	42·5	50·4	10·03	15·5	139 23
June	54·9	39·1	47·0	9·90	15·3	101 15
July	52·9	36·7	44·8	9·05	16·3	105 1
August	54·6	38·1	46·3	9·02	15·8	150 11
September	57·8	42·4	50·1	9·37	16·5	133 51
October	59·8	45·7	52·7	11·50	18·7	161 35
November	62·3	48·4	55·3	10·31	17·0	174 5
December	66·3	52·2	59·2	10·54	15·8	220 33
Year	60·9	45·8	53·3	105·62	152·2	1,857 38

The chief health resort of the South Island, Hanmer Spa, is in North Canterbury, situated on a small plateau. On account of its altitude, 1,120 ft., it enjoys an invigorating climate, with a mean annual temperature of only about one degree below that of Christchurch. Owing to its elevated position and nearness to the mountains Hanmer is in some winter seasons subject to rather severe snowstorms, such as are never experienced on the Canterbury Plains. The mean annual rainfall is 38.15 in., and the mean total sunshine 1,992 hours.

The district of Canterbury comprises a variety of topographical features. A plain stretches over a hundred miles from north-east to south-west, with a maximum width of about forty miles from the east coast to the foothills to the westward. The latter merge into the mountainous country culminating in the main range of the Southern Alps, which divide the provinces of Canterbury and Westland, and afford a protection from the heavily-moisture-laden north-westerly winds. The rainfall of the Canterbury Plains is in consequence much restricted, the average being about 26 in. There is, however, a remarkable progressive increase from east to west, as is shown by the records. At Christchurch the mean is 25.13 in.; at Mount Torlesse Station (near Springfield), 39.86 in. The climate of Canterbury might almost be described as Continental in type, with large extremes of temperature between summer and winter and day and night. Except in the three summer months frosts are numerous, and even in the early spring and late autumn they are at times severe enough to damage vegetation of a tender nature. In summer, day temperatures of over 90° in the shade are sometimes experienced. Both with regard to climate and soil the Plains have proved most suitable for agricultural farming, and much of it is capable of growing splendid cereal and root crops. The prevailing winds in Canterbury are north-east and south-west, while north-westerlies are not, as often supposed, of frequent occurrence. They are most common in the spring-time, and, being dry and warm, they have a somewhat enervating effect, though in winter-time they come as a welcome change from the keen temperatures then generally ruling. The bright sunshine, as recorded at Lincoln, shows a daily average for the year of 5.8 hours.

Month.	Mean Temperatures for 23 Years.			Mean Rainfall for 42 Years.	
	Maximum.	Minimum.	Mean.	Inches.	Days.
	° F.	° F.	° F.		
January	70.7	52.6	61.6	2.06	9.1
February	69.3	52.6	60.9	1.87	7.9
March	66.4	50.0	58.2	2.21	9.5
April	61.8	45.1	53.4	1.92	9.5
May	56.1	40.1	48.1	2.56	11.6
June	50.9	36.0	43.4	2.67	12.4
July	49.9	34.9	42.4	2.87	13.4
August	52.2	36.2	44.2	1.79	11.0
September	57.2	40.5	48.8	1.69	9.9
October	62.2	43.6	52.9	1.64	9.3
November	66.0	47.4	56.7	1.85	10.3
December	69.8	51.4	60.6	2.11	9.5
Year	61.0	44.2	52.6	25.23	123.4

Otago, as the southernmost part of New Zealand is now called, is very diversified both as regards its physical features and its climate. Inland, in Central and North Otago, the climate is dry and clear—hot in summer and cold in winter. The rainfall for this district averages from 13 in. to 20 in. Near the coast, in the Dunedin district, the rainfall is more plentiful, averaging from 30 in. to 40 in. per annum, a good deal of which falls in light drizzling rains. The records for Dunedin are as follows:—

Month.	Mean Temperatures for 55 Years.			Mean Rainfall for 62 Years.	
	Maximum.	Minimum.	Mean.	Inches.	Days.
	° F.	° F.	° F.		
January	66.4	49.5	57.0	3.40	14.2
February	65.7	49.4	56.6	2.79	11.5
March	62.9	47.8	55.3	2.96	12.8
April	60.3	44.7	51.6	2.72	12.8
May	53.3	41.0	47.0	3.31	13.7
June	49.3	38.4	43.1	3.10	12.9
July	47.5	36.9	41.5	3.07	13.2
August	49.9	37.7	43.1	3.09	12.7
September	53.9	40.7	47.0	2.71	12.6
October	59.0	42.7	50.8	3.05	14.1
November	61.4	44.9	53.1	3.23	14.0
December	64.5	47.9	55.3	3.52	14.5
Year	57.8	43.5	50.1	36.95	15.9

Queenstown, on Lake Wakatipu, amongst the mountains, at an elevation of over 1,000 ft., furnishes the following averages:—

Month.	Mean Temperatures for 9 Years.			Mean Rainfall for 30 Years.	
	Maximum.	Minimum.	Mean.	Inches.	Days.
	° F.	° F.	° F.		
January	70.4	49.9	60.1	2.82	8.8
February	70.2	49.6	59.9	1.82	5.6
March	66.4	47.9	57.1	2.55	7.2
April	59.1	43.8	51.5	2.97	7.9
May	51.8	38.6	45.2	2.63	7.5
June	45.9	33.7	39.7	2.39	6.9
July	43.3	31.8	37.5	1.89	5.9
August	47.3	33.8	40.6	1.82	6.2
September	54.3	38.7	46.5	2.60	7.5
October	59.8	42.1	50.9	3.69	9.1
November	63.2	44.5	53.8	2.74	8.4
December	68.0	49.2	58.6	2.44	8.1
Year	58.3	42.0	50.1	30.36	89.1

At Invercargill, the chief town of Southland, the averages are as follow :—

Month.	Mean Temperatures for 11 Years.			Mean Rainfall for 26 Years.	
	Maximum.	Minimum.	Mean.	Inches.	Days.
January	°F. 65·8	°F. 48·3	°F. 57·0	4·28	15·8
February	65·7	47·6	56·6	2·86	11·7
March	64·4	46·0	55·2	3·57	14·0
April	59·1	42·7	50·9	4·37	16·7
May	53·5	37·7	45·6	4·59	17·4
June	49·7	36·2	42·9	3·48	15·9
July	48·4	34·0	41·2	3·43	15·8
August	52·1	36·1	44·1	3·39	14·6
September	56·7	39·0	47·8	3·09	13·7
October	59·5	42·8	51·1	4·75	17·2
November.. ..	61·0	43·6	52·3	4·45	17·6
December.. ..	63·8	46·2	55·0	4·33	15·5
Year	58·3	41·7	50·0	46·59	185·9

The average rainfall of Southland is between 40 in. and 50 in., but towards Queenstown the rainfall is between 30 in. and 40 in. The rainfall is well distributed throughout the year, but there is less wind in winter than in summer.

Stewart Island has a wonderfully mild and moist climate, especially on its eastern side, with an average rainfall of 65·18 in.

NEW ZEALAND RAINFALL.

The following tables show the difference, above or below the mean, for each month in the year :—

NORTH ISLAND RAINFALL, 1919.

Monthly Means compared with the Averages for Fourteen Previous Years.

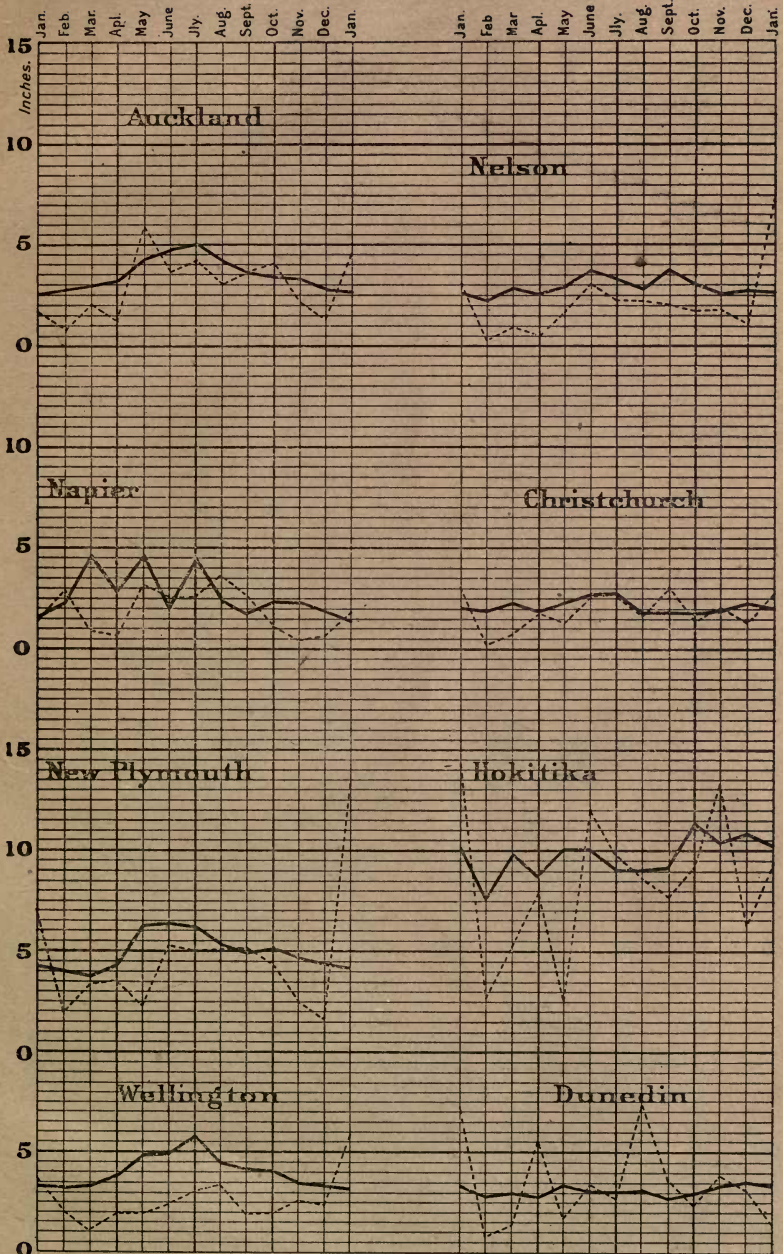
	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
+	..	..	..	..	..	..	..	4·47	4·04	..	..	..
Av.	3·21	2·98	4·48	4·04	4·82	4·48	5·39	4·26	3·83	4·47	3·72	3·35
-	2·62	1·79	2·24	1·35	2·95	3·25	3·90	..	..	3·23	2·27	1·68

Mean Number of Days with Rain, compared with the Averages for Fourteen Previous Years.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
+	11·6	..	..	..	..	..	..	17·0	..	..	..	..
Av.	9·9	8·7	11·3	13·1	14·8	15·5	17·1	14·7	14·7	15·5	13·7	11·3
-	..	6·1	8·6	9·1	9·5	14·4	16·9	..	13·4	9·2	12·9	9·3

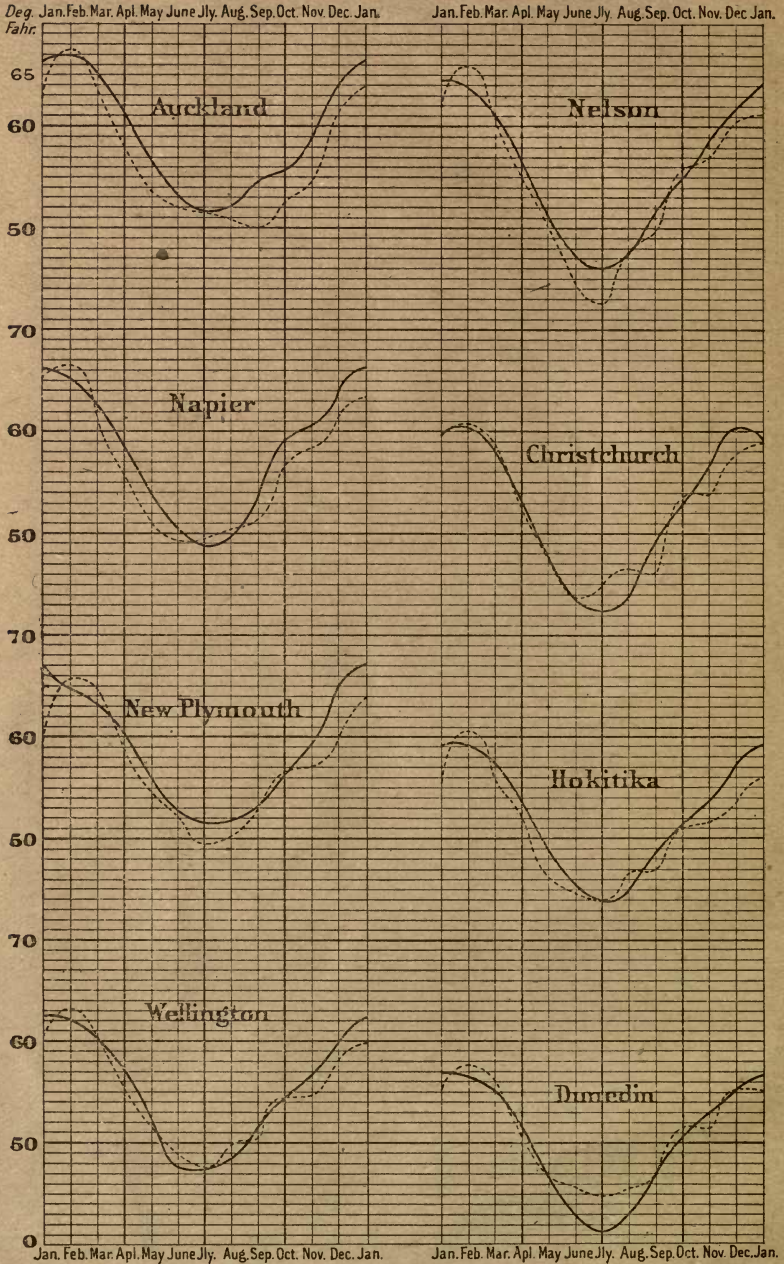
+ Above the average.

- Below the average.



Continuous line showing the mean monthly rainfall.
 Dotted line showing the total monthly rainfall from January, 1919, to January, 1920 (inclusive).

TEMPERATURE CURVES.



Continuous line showing the mean monthly temperature in shade for past years. Dotted line showing the mean monthly temperature from January, 1919, to January, 1920 (inclusive).

SOUTH ISLAND RAINFALL, 1919.

Monthly Means compared with the Averages for Fourteen Previous Years.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
+	5.96	..	..	..	..	..	..	3.65	4.01	..	4.03	..
Av.	3.59	2.81	3.62	3.31	3.62	3.93	3.88	3.16	3.88	3.88	3.42	3.82
-	..	0.67	1.52	3.19	1.49	3.75	3.43	..	..	3.01	..	2.49

Mean Number of Days with Rain, compared with the Average for Fourteen Previous Years.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
+	16.4	..	..	..	..	..	..	14.0	..	..	..	..
Av.	12.1	9.4	11.7	12.1	12.4	13.4	13.5	12.4	13.5	14.3	13.9	13.0
-	..	6.0	7.7	11.4	7.5	11.3	12.1	..	12.1	11.8	13.7	10.4

+ Above the average.

- Below the average.

METEOROLOGY.

TEMPERATURE, RAINFALL, ATMOSPHERIC PRESSURE, AND WIND THROUGHOUT NEW ZEALAND, AS OBSERVED AT TWELVE STATIONS, FOR THE YEAR 1919.

(The observations were taken at 9 a.m.)

Stations.	Months.	Temperature in Shade.					Rainfall.		Mean Height of Barometer.	Prevailing Winds.
		Highest.	Lowest.	Mean Max. Temp.	Mean Min. Temp.	Mean Temp. for Month.	Wet Days.	Fall.		
Auckland (lat. 36° 50' S.; long. 174° 50' E. alt. 125 ft.)—	January	79.5	50.0	69.6	56.0	62.8	13	1.70	29.91	W, SW.
	February	81.0	58.0	73.4	61.8	67.6	7	0.84	30.13	N, SW.
	March ..	77.0	46.0	70.3	56.5	63.4	13	2.07	30.07	SW, W.
	April ..	69.0	41.0	65.0	51.8	58.4	15	1.12	30.11	W, SW.
	May ..	66.0	39.0	61.1	49.2	55.2	14	5.94	30.18	SW, SE.
	June ..	62.5	40.0	58.3	46.7	52.5	24	3.60	29.97	W, SW.
	July ..	62.0	39.0	56.9	46.1	51.5	17	4.15	30.01	SW, S, W.
	August ..	62.0	39.0	57.6	44.0	50.8	19	3.00	29.99	SW, W.
	September	65.0	38.5	58.3	45.5	51.9	18	3.56	29.83	SW, NW.
	October ..	66.0	42.0	62.0	49.0	55.5	10	4.06	30.00	SW, W.
	November	69.0	41.0	64.7	48.7	56.7	16	2.16	29.92	W, SW.
	December	74.0	43.5	68.2	54.5	61.3	8	1.35	30.00	SW.
Greenmeadows (Napier) (lat. 39° 32' S.; long. 176° 58' E.; alt. 70 ft.)—	January	88.0	43.0	75.7	54.8	65.2	3	1.44	29.771	NW, NE.
	February	85.0	47.0	74.6	58.5	66.6	2	2.90	30.105	SE, W, N.
	March ..	81.0	42.0	70.2	52.0	61.1	6	0.97	30.013	W, NW.
	April ..	73.5	33.5	66.5	45.2	55.8	4	0.68	30.095	NW, SW.
	May ..	77.0	34.0	59.8	42.2	51.0	6	3.15	30.203	W, SW.
	June ..	66.0	30.0	58.3	40.1	49.2	3	2.56	29.926	NW, W.
	July ..	71.0	29.5	56.6	42.3	49.4	9	2.57	30.049	NW, SW.
	August ..	65.5	31.0	58.2	42.5	50.3	10	3.65	29.969	NW, W, N.
	September	72.5	35.0	60.4	42.2	51.3	5	2.56	29.849	W.
	October ..	71.0	38.5	65.8	47.1	56.5	3	1.03	29.931	NW, W.
	November	77.0	39.0	68.1	48.5	58.3	3	0.45	29.795	NW, W.
	December	85.0	38.0	72.5	50.5	61.5	4	0.64	29.965	NW, W.

Stations.	Months.	Temperature in Shade.					Rainfall.		Mean Height of Barometer.	Prevailing Winds.
		Highest.	Lowest.	Mean Max. Temp.	Mean Min. Temp.	Mean Temp. for Month.	Wet Days.	Fall.		
Palmerston North (lat. 40° 21' S.; long. 175° 37' E.; alt. 108 ft.)—	January	76.0	38.0	67.6	50.2	58.9	7	1.73	..	W.
	February	79.0	41.0	72.5	54.2	63.3	6	1.71	..	W.
	March	77.0	32.0	68.8	47.8	58.3	6	1.28	..	W, E.
	April	71.0	30.0	62.9	44.3	53.6	7	0.88	..	W.
	May	66.0	26.0	58.5	38.6	48.5	7	0.85	..	E, W.
	June	61.0	24.0	55.0	39.0	47.0	11	2.29	..	W, E.
	July	60.0	20.0	53.9	38.6	46.3	14	2.77	..	W.
	August	62.0	31.0	55.4	44.8	50.1	17	3.84	..	W.
	September	64.0	32.0	57.1	41.3	49.2	12	2.72	..	W.
	October	70.0	35.0	62.1	45.2	53.6	8	1.73	..	W.
	November	70.0	33.0	60.8	45.5	53.1	15	2.39	..	NW, W.
	December	80.0	32.0	65.8	45.4	55.6	6	1.13	..	W.
New Plymouth (lat. 39° 37' S.; long. 174° 4' 58' E.; alt. 160 ft.)—	January	75.0	45.0	67.5	51.5	59.5	20	7.01	..	SW.
	February	80.0	50.0	74.5	57.2	65.8	4	1.93	..	S, SW.
	March	78.0	47.0	74.3	55.3	64.8	9	3.42	..	S, SW.
	April	72.0	45.0	66.0	52.1	59.0	10	3.52	..	S, SW.
	May	68.0	31.0	60.3	46.9	53.6	7	2.32	..	SE, S, SW.
	June	65.0	38.0	58.7	45.5	52.2	21	5.23	..	SW, S.
	July	63.0	33.0	57.2	41.8	49.5	20	5.00	..	S, SW.
	August	69.0	35.0	57.6	42.6	50.1	21	5.04	..	SW, S.
	September	67.0	40.0	60.4	45.4	52.9	21	5.10	..	S, SW.
	October	70.0	44.0	62.1	50.8	56.4	17	4.33	..	SW.
	November	69.0	44.0	62.9	51.2	57.0	17	2.52	..	SW.
	December	73.0	38.0	67.7	52.0	59.8	11	1.61	..	SW, S.
Wellington (lat. 41° 16' S.; long. 174° 46' E.; alt. 10 ft.)—	January	71.8	43.5	65.2	55.4	60.3	10	3.74	29.748	NW, N.
	February	81.1	44.9	69.6	56.9	63.2	3	2.02	30.140	NW, N, S.
	March	73.8	39.1	66.8	53.9	60.3	6	1.10	30.006	NW, N.
	April	67.5	33.2	60.7	49.7	55.2	12	1.93	30.062	N.
	May	63.4	33.6	57.0	46.2	51.6	9	1.92	30.202	S, N.
	June	65.9	29.9	54.9	43.0	48.9	15	2.44	29.892	N, S, NW.
	July	57.7	32.0	53.4	42.3	47.8	18	3.05	30.052	S, NW.
	August	64.5	33.0	54.9	44.7	49.8	17	3.42	29.954	NW, N, S.
	September	65.3	31.2	57.1	43.8	50.4	12	1.96	29.857	NW, S.
	October	68.8	40.7	60.4	48.4	54.4	9	1.98	29.953	NW, NE, S.
	November	65.8	35.8	60.8	48.6	54.7	11	2.54	29.801	NW, N.
	December	79.0	38.4	64.9	51.1	58.0	14	2.41	29.934	N, NW.
Nelson (lat. 41° 17' S.; long. 173° 18' 46" E.; alt. 34 ft.)—	January	83.0	43.0	72.1	51.5	61.8	10	3.03	..	SW, NE.
	February	83.5	49.5	74.9	57.0	65.9	3	0.28	..	SE, NE, SW.
	March	78.0	41.0	70.2	50.9	60.5	6	0.91	..	SW, NE.
	April	71.5	36.0	64.5	46.0	55.2	5	0.53	..	SW, SE.
	May	68.0	29.0	59.3	41.1	50.2	5	1.63	..	SE.
	June	61.0	26.0	54.2	35.1	44.6	12	3.09	..	SE, SW.
	July	61.5	22.0	52.7	32.9	42.8	10	2.22	..	NE, SE.
	August	62.0	*	55.5	*	*	11	2.24	..	SE, NE.
	September	69.0	*	58.8	*	*	11	2.09	..	SW, SE.
	October	71.0	39.0	64.8	46.8	55.8	6	1.70	..	SW.
	November	74.0	37.0	66.3	47.6	56.9	9	1.82	..	SW, N.
	December	76.0	37.0	70.3	50.7	60.5	8	1.04	..	N, SW.
Hokitika (lat. 42° 30' S.; long. 170° 49' E.; alt. 12 ft.)—	January	66.5	43.0	60.8	50.0	55.4	27	14.26	29.779	N, SW.
	February	71.5	45.0	66.8	54.3	60.5	10	2.64	30.181	SW.
	March	70.0	36.5	63.3	48.6	55.9	14	5.24	30.022	SW.
	April	65.0	34.0	58.7	45.7	52.2	17	7.89	30.093	SW.
	May	60.0	29.0	53.9	38.6	46.2	7	2.59	30.211	E, SE.
	June	57.5	26.5	51.1	38.1	44.6	19	12.09	29.880	E, SW.
	July	56.0	29.0	51.3	36.6	43.9	16	9.85	30.038	E.
	August	63.5	29.5	53.7	39.8	46.7	21	8.65	29.965	E.
	September	60.5	28.0	54.9	39.2	47.0	17	7.72	29.862	E, NE.
	October	65.5	31.5	57.4	44.7	51.0	18	9.15	29.974	SW, N.
	November	61.0	33.0	57.5	45.6	51.5	23	13.18	29.831	SW.
	December	73.0	33.0	60.5	46.9	53.7	16	6.27	29.970	SW.

* Incomplete.

Stations.	Months.	Temperature in Shade.					Rainfall.		Mean Height of Barometer.	Prevalling Winds.
		Highest.	Lowest.	Mean Max. Temp.	Mean Min. Temp.	Mean Temp for Month.	Wet Days.	Fall.		
Christchurch (lat. 43° 31' S.; long. 172° 38' 50" E.; alt. 25 ft.)—	January	82·7	33·2	69·2	49·8	59·5	13	3·09	29·615	NE, SW.
	February	81·8	39·0	68·6	53·0	60·8	6	0·21	30·095	NE, SW.
	March ..	81·1	35·8	69·2	48·2	58·7	4	0·69	29·906	NE, SW.
	April ..	73·6	29·0	62·2	42·8	52·5	10	1·83	29·977	NE, SW.
	May ..	67·3	23·2	56·2	39·2	47·7	7	1·27	30·169	SW, NE.
	June ..	66·6	26·5	52·0	35·4	43·7	7	2·59	29·824	SW, NE.
	July ..	68·8	27·1	52·3	37·5	44·9	12	2·67	30·013	NE, SW.
	August ..	67·9	30·5	53·4	39·6	46·5	14	1·58	29·929	SW, NE.
	September	74·9	23·3	54·7	37·4	46·0	12	3·02	29·844	SW, NE.
	October ..	75·6	32·9	63·0	44·2	53·6	7	1·42	29·866	NE, SW.
	November	74·4	35·7	62·1	45·6	53·8	11	2·09	29·733	SW, NE.
	December	81·1	33·4	67·6	48·1	57·8	7	1·24	29·855	NE, SW.
Lincoln (lat. 43° 32' 16" S.; long. 172° 38' 39" E.; alt. 42 ft.)—	January	84·0	37·0	70·7	47·1	58·9	14	4·50	29·620	NE, NW.
	February	88·8	37·6	72·3	50·6	61·5	3	0·21	30·129	NE.
	March ..	85·0	34·8	71·3	46·5	58·9	6	0·55	29·933	NE, NW.
	April ..	78·8	30·2	65·0	42·4	53·7	9	2·04	30·062	NE, SW.
	May ..	70·0	28·2	59·3	37·2	48·2	6	1·10	30·176	NE, SW.
	June ..	67·0	26·6	54·4	35·0	44·7	8	2·54	29·811	NE, SW.
	July ..	67·4	23·0	53·8	36·3	45·0	11	2·46	29·994	NE, SW, NW.
	August ..	68·0	30·2	54·8	37·7	46·2	12	1·96	29·931	NE, SW.
	September	74·0	21·8	57·8	37·0	47·4	11	2·65	29·845	SW, NE.
	October ..	76·6	33·5	64·1	41·9	53·0	8	1·68	29·842	NE, NW.
	November	73·0	34·0	64·4	43·2	53·8	12	2·44	29·730	S, NE, SW.
	December	85·0	29·8	70·2	43·9	57·0	10	1·41	29·868	SW, NE.
Waimate (lat. 44° 44' S.; long. 171° E.; alt. 200 ft.)—	January	81·0	36·0	66·0	46·6	56·3	17	4·95	..	NE.
	February	89·0	40·0	65·8	49·9	57·8	11	0·86	..	NE, SE.
	March ..	77·0	36·0	68·1	45·4	56·7	4	0·70	..	NE, NW.
	April ..	71·0	33·0	62·0	41·8	51·9	8	2·55	..	NE, SW.
	May ..	70·0	27·0	56·8	37·2	47·0	4	0·12	..	SW.
	June ..	70·0	24·0	53·6	34·6	44·1	5	1·77	..	SW.
	July ..	61·0	26·0	54·6	34·4	43·0	10	2·09	..	SW, NE.
	August ..	61·0	27·0	51·9	36·6	44·3	14	4·65	..	NE.
	September	73·0	31·0	53·9	37·4	45·6	12	4·83	..	NE, SW.
	October ..	74·0	30·0	60·4	42·0	51·2	10	1·02	..	NE.
	November	75·0	33·0	61·4	43·0	52·2	11	4·10	..	NE, SW.
	December	77·0	36·0	65·4	45·4	55·4	9	2·48	..	NE.
Dunedin (lat. 45° 52' S.; long. 170° 31' E.; alt. 300 ft.)—	January	78·0	38·0	63·0	47·4	55·2	25	7·12	29·608	SW, NE.
	February	84·0	42·0	66·0	49·4	57·7	4	0·76	30·112	SW, NE.
	March ..	75·0	36·0	64·5	47·7	56·1	10	1·37	29·010	NE, SW.
	April ..	70·0	35·0	57·4	43·5	50·4	16	5·57	29·973	SW.
	May ..	68·0	30·0	53·4	40·2	46·8	12	1·66	30·164	N, SW.
	June ..	68·0	30·0	52·4	39·1	45·7	13	3·40	29·818	SW, N.
	July ..	63·0	31·0	51·2	38·6	44·9	11	2·68	29·968	NE, SW, N.
	August ..	67·0	30·0	52·4	38·9	45·6	18	7·48	29·919	SW, NE.
	September	73·0	29·0	54·4	39·9	47·1	15	3·58	29·822	SW, NE.
	October ..	74·0	35·0	60·9	42·4	51·6	19	2·34	29·824	SW, NE.
	November	69·0	35·0	60·1	43·0	51·5	19	3·87	29·707	SW, NE.
	December	83·0	36·0	64·2	46·4	55·3	13	3·07	29·850	SW, NE.
Invercargill (lat. 46° 25' S.; long. 168° 21' E.; alt. 12 ft.)—	January	72·0	37·0	61·7	46·1	53·9	27	7·75	..	SW, E.
	February	82·0	36·0	65·5	47·9	56·7	10	0·41	..	SW.
	March ..	77·0	28·0	65·1	42·1	53·6	17	3·14	..	SW, NE.
	April ..	72·0	34·0	58·1	42·4	50·2	25	7·09	..	E, SW.
	May ..	65·0	23·0	54·3	38·1	46·2	21	4·04	..	SW, E.
	June ..	60·0	24·0	50·8	36·5	43·6	18	3·53	..	E.
	July ..	58·0	19·0	49·6	33·2	41·4	19	4·09	..	E.
	August ..	62·0	26·5	51·8	35·9	43·8	22	5·34	..	E.
	September	69·0	29·0	56·7	35·9	46·3	12	3·43	..	E.
	October ..	67·0	30·0	57·3	41·6	49·4	20	6·94	..	SW, NW.
	November	70·0	35·0	57·5	42·2	49·8	21	4·14	..	SW, W.
	December	78·0	38·0	63·0	45·6	54·3	18	3·83	..	SW, W.

COMPARATIVE TABLE, YEAR 1919.

Stations.	Temperature in Shade.					Rainfall.		Mean Height of Barometer.	Prevailing Winds
	Highest, and Date.	Lowest, and Date.	Mean Max. Temp. for Year.	Mean Min. Temp. for Year.	Mean Temp. for Year.	Days on which Rain fell.	Total Fall.		
Auckland ..	° F. 81·0 Feb. 11 & 12	° F. 38·5 Sept. 8	° F. 63·8	° F. 50·8	° F. 57·3	No. 174	Inches. 33·55	Inches. 30·001	SW, W.
Greenmeadows (Napier)	88·0 Jan. 22	29·5 July 17	65·6	47·2	56·4	58	22·60	29·973	NW, W.
Palmerston N.	80·0 Dec. 30	24·0 June 3	61·7	44·6	53·1	116	23·32	..	W, E.
New Plymouth	80·0 Feb. 23	31·0 May 26 & 27	64·1	49·4	56·7	178	47·03	..	SW, S.
Wellington ..	81·1 Feb. 24	29·9 June 1	60·5	48·7	54·6	136	28·51	29·967	NW, N, S.
Nelson ..	83·5 Feb. 18	22·0 July 17	63·6	*	*	96	20·58	..	SW, NE, SE.
Hokitika ..	73·0 Dec. 31	26·5 June 27	57·5	44·0	50·7	205	99·53	29·984	SW, E.
Christchurch	82·7 Jan. 23	23·3 Sept. 2	60·9	43·4	52·1	110	21·70	29·902	NE, SW.
Lincoln ..	88·8 Feb. 18	21·8 Sept. 2	63·2	41·6	52·4	110	23·54	29·912	NE, SW.
Waimate ..	89·0 Feb. 18	24·0 June 28	59·7	41·2	50·4	115	30·12	..	NE, SW.
Dunedin ..	84·0 Feb. 17 & 20	29·0 Sept. 1	58·3	43·0	50·6	175	42·90	29·890	SW, NE.
Invercargill ..	82·0 Feb. 21	19·0 July 31	57·6	40·6	49·1	230	53·73	..	SW, E.

* Incomplete.

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