

The Delineation of Natural Areas in New Zealand

Chairman: Mr. L. W. Tiller

Climatic Districts of New Zealand

N. G. Robertson

There is no generally accepted division of New Zealand into climatic districts. The whole country lies within the belt of prevailing westerly winds and the climate as a whole is usually described as moist, temperate. This is in agreement with the well-known system of classifying climates due to Koppen, according to which the whole of New Zealand, with a few minor exceptions, has the designation Cfb, that is, a warm, temperate, rainy climate without any marked dry season. Koppen's system is, however, not sensitive enough to distinguish climatic districts within New Zealand.

In 1931 Kidson published a map containing a subdivision of the country, using as an index the annual variation of rainfall. This map was modified in 1932 (see list of references) and again in 1937, when it was published as a map of climatic districts. Such an index, however, does not appear to be a satisfactory basis for representing the climate as a whole.

Two other systems of classification, both due to Thornthwaite and published in 1931 and 1948 respectively, have been applied to New Zealand conditions in a number of papers by Garnier. A revised map, based on Thornthwaite's 1931 system, was published by Garnier in 1950; in his 1951 paper he used Thornthwaite's 1948 system. Both systems lead to a detailed and rather complex subdivision of the country into climatic districts using rainfall and temperature as the

basic elements; evaporation is also used but is calculated by means of a formula in which the only weather element is temperature. Generally speaking rainfall and temperature are without question the most important climatic elements but, in some areas, extreme of windiness, sunshine, etc., may be of equal importance in distinguishing climatic variations.

The accompanying map was prepared in an attempt to take account of some additional weather elements wherever they were considered to exert a major influence over the temperature and rainfall contribution to the climate. The aim was also to make it self-explanatory by adding brief descriptive notes regarding the main climatic characteristics of each district.

It should not be inferred that the boundaries between adjacent climatic districts necessarily represent a sharp climatic change. In general there is only a gradual transition of climate except where the boundaries coincide with some marked topographical feature.

REFERENCES

- GARNIER, B. J., 1950: New Zealand Weather and Climate. *N.Z. Geog. Soc. Misc. Ser.* 1: 1-154.
 GARNIER, B. J., 1951: *Trans. Roy. Soc. N.Z.* 79: 87-103.
 KIDSON, E., 1931: *N.Z. J. Sci. Tech.* 12: 268-72.
 KIDSON, E., 1932: *Handbuch der Klimatologie, Band iv, Teil S ed. Koppen & Geiger*, p S 114.
 KIDSON, E., 1937: *Q. J. R. Met. Soc.* 63:83-92.

KEYS TO CLIMATE AND SOIL MAPS

MAIN CLIMATIC DISTRICTS

(See map)

- A. Very warm humid summers, mild winters. Annual rainfall 45-60 inches with maximum in winter. Prevailing wind south-westerly but occasional strong gales and heavy rain from east or northeast from Auckland northwards and about Coromandel Peninsula.
- A₂ Similar to type A but much wetter; rainfall 60-100 inches.
- B. Sunny, rather sheltered areas which receive rains of very high intensity at times from the northeast and north. Very warm summers and mild winters. Annual rainfall 40-60 inches with maximum in winter.
- C. Very warm summers, day temperatures occasionally above 90°F with dry Foehn NW wind blowing. Rainfall 40-60 inches per annum; marked decrease in amount and reliability of rain in spring and summer; moderate winter temperatures with maximum rainfall in this season.
- C₀ Drier than type C—rainfall 25-35 inches. Very sunny.
- C₂ Cooler and wetter hill climates. Very heavy rains at times from east or southeast; annual rainfall mainly 60-80 inches.
- D. West to northwest winds prevail with relatively frequent gales. Mean annual rainfall 35-50 inches; rainfall reliable and evenly distributed through the year. Warm summers, mild winters.
- D₂ Wetter than D—rainfall 50-80 inches.
- E. Mild temperatures, high rainfall increasing rapidly inland with height, minimum rainfall in winter especially in the south. Prevailing winds SW but gales not frequent at low levels in spite of exposed coastline.
- F. Low rainfall, 23-30 inches; in the south slightly more in summer than in other seasons. Warm summers with occasional hot Foehn north-

westerlies giving temperatures above 90°F, cool winters with frequent frosts and occasional light snowfalls. Prevailing winds NE near the coast, NW inland.

- F₂ Cooler and wetter hill climates. Rainfall 30-60 inches. NW winds prevail with occasional very strong gales specially along river courses. Snow may lie for several weeks in winter.
- F₀ Semi-arid areas, rainfall 13-20 inches. Very warm, dry summers; cold winters.
- G. Warm summers, cool winters. Rainfall 25-35 inches, evenly distributed except for slight falling off in winter.
- G₂ Wetter and slightly cooler than G climates; rainfall 35-50 inches; in coastal districts cloudy, windy conditions and frequent showers.
- M. High rainfall, mountain climate.

“NATURAL AREAS” OF NEW ZEALAND SOILS.
(Boundaries generalized from Soil Map of N.Z. 1948.)

SOILS IN WHICH THE ENVIRONMENT IS

FULLY EXPRESSED:

1. Soils of the cool semi-arid zone, developed under tussock grasses.
2. Soils of the mild sub-humid zone developed mainly under tussock grasses.
3. Soils of the humid zone developed mainly under forest.

SOILS IN WHICH THE ENVIRONMENT IS NOT FULLY EXPRESSED, DUE TO THE DOMINANCE OF CERTAIN FACTORS:

4. Skeletal soils on steep slopes dominated by the topography factor.
5. Recent soils from alluvium or volcanic ash, dominated by their youth—the time factor.
6. Soils from old volcanic ash, dominated by their abnormal parent material.
7. Soils from younger volcanic ash, dominated by their youth and their abnormal parental material.

Excursion

On Saturday, May 12th, there was an excursion by bus from Wellington, over the Rimutaka Range, to the southern portion of the Wairarapa district.

During the excursion stops were made at the following places:

1. Summit of Rimutaka Range: Mr. A. L. Poole and Mr. A. P. Druce pointed out features of the vegetation, which consists of scrub (manuka and some sub-alpine species) and remnants of the red beech and silver beech forest which formerly covered the area.

2. Western Lake Forest Reserve: Beech forest here comes down to the edge of Lake Wairarapa. Mr. Poole and Mr. Druce explained some features of the forest.

3. Lake Pounui: This is a small lake which is a bird sanctuary, and since the shooting

season was in progress considerable numbers of waterfowl were seen. A stop was made at this point for lunch.

4. Top of hill above Lake Onoke: From this point an excellent view was obtained of Palliser Bay, Lake Onoke, which is separated from the sea by a long narrow shingle spit, Lake Wairarapa, and the southern portion of the Wairarapa district, bounded on the east by the Aorangi Range.

5. Lake Onoke: Most of those present walked along the narrow spit and examined contrasting conditions on the seaward and landward sides.

From Lake Onoke the bus returned to Wellington over the same route. Commentaries on points of interest near the road were given throughout the excursion by various members, using the loudspeaker system in the bus.

