

March, 1949, these numbers had been increased to 830 manual and 45 automatic rain-gauges. Practically the whole of these increases have been made in sparsely populated areas from which it was so important to have records, and the increase has only been possible by landholders agreeing to care for the instruments and volunteering to take observations.

The Director of Meteorological Services has also been able to progress with the analysis of past excessive rainfalls recorded at every rainfall station in New Zealand. The statistics of these excessive falls are practically complete and copies for particular stations can now be supplied upon request.

Council wishes to place on record its appreciation of the active co-operation received at all times from Meteorological Services and also to acknowledge the continued assistance given by Catchment Board and Ministry of Works Engineers as well as all the voluntary unpaid rainfall observers in this basic data collection work.

It is regretted that, generally, the situation regarding river-gauging stations is not so satisfactory throughout the country. Practically all the difficulties can be attributed either to general staff shortages or to staff which might be available under normal circumstances being diverted to works which are more of the moment. While it was confidently expected that at least 4 stations authorized would be completed during the year, in actual fact none was built, this, however, being mainly due to the non-supply of steel forms. At the end of the year 3 stations were actually under construction.

Surveys of gauging-sites are continuing and two survey parties are being organized for hydrological work, one each in the North and South Islands.

Amending legislation concerning the control of ground water is under consideration.

During the year under review a thunderstorm, producing phenomenal intensities, was experienced in the Bay of Plenty area, while record floods were recorded in Poverty Bay and Wairoa and a heavy flood occurred in the Clutha River.

The Bay of Plenty thunderstorm occurred on the 17th to 18th April, 1948, and covered most of the coastal area of Bay of Plenty. The Tauranga automatic rain-gauge recorded 2 in. of precipitation in twenty minutes, 3.75 in. in one hour, 5.75 in. in two hours, and 8.35 in. in six hours.

In Poverty Bay on 13th May, precipitation was wide and heavy, various falls being recorded between 3.61 in. and 11.56 in. on that day, with between 1 in. and 3.96 in. on the preceding day. This rainfall resulted in a record flood in the Waipaoa River on 14th May, a peak discharge of 140,000 cusecs being recorded at Kanakanaia Bridge from a catchment of 606 square miles.

In the Wairoa River Catchment over the three days, 12th to 14th May, between 6.79 in. and 17.70 in. of rain fell, resulting in the largest peak discharge which has ever been recorded on a New Zealand river—namely, 404,100 cusecs at Wairoa Town Bridge from a catchment of 1,415 square miles.

Warm rains and snow, averaging about 1 in. of precipitation, fell in the upper Clutha Catchment on 28th and 29th October, giving a river fresh at Roxburgh of 37,500 cusecs on 30th October. Heavy rain again fell on 1st and 2nd November, in amount between 1 in. and 6.39 in., resulting in a flood of 78,000 cusecs at Roxburgh on 3rd November from a catchment of 6,660 square miles, and a flood of 100,000 cusecs at Balclutha on 4th November from a catchment of 8,100 square miles. At Roxburgh this is thought to have been the second highest flood on record, the largest, 117,000 cusecs, having occurred in September, 1878.