

**Table 1: Reference climate stations**

North Island		South Island		Offshore Islands
Kaitaia	Paraparaumu	Hokitika	Lauder	Raoul
Auckland	Wellington	Milford Sound	Timaru	Chatham
Hamilton	Gisborne	Appleby	Dunedin	Campbell
Rotorua	Whakatu	Blenheim	Invercargill	
New Plymouth	East Taratahi	Lincoln		
Taihape		Omarama		

The locations of these reference climate stations are shown in figure 1.

## HOMOGENISATION PROCEDURES

Conrad (1944) defines homogeneity of a climatological series as follows:

*A numerical series representing the variations of a climatological element is called 'homogeneous' if the variations are caused by and only by variations of weather and climate.*

The purpose of the homogenisation process was to produce as long a temperature series as possible for each reference climate station. This was done by adjusting data from *earlier sites* to the *current site*. Any valid data from earlier neighbouring stations were also included and adjusted to the reference station site. Thus the temperature series for a given climate station could be derived from data from several earlier sites and adjacent stations.

The detailed homogenisation procedure for the time series for each reference climate station is described in Rhoades and Salinger (1992).

The main steps in the homogenisation process were:

- i Conduct a systematic search for all climate data for a given climate station and nearby climate stations. These data were needed for comparison and adjustment purposes.
- ii Check the mean monthly data for obvious errors. Any missing data in the series were estimated, where possible, using data from neighbouring stations.
- iii Check irregularities in the climate data time series for possible site changes, or substantial environmental changes, or for other reasons noted in the climate stations histories (Fouhy et al, 1992). The temperature anomaly was calculated from the difference of the homogenised seasonal or annual temperature and the 1951-1980 reference values. This is in accordance with the practice followed by the IPCC (Houghton et al, 1990).
- iv Run the homogenisation computer programs (Rhoades and Salinger, 1992) using mean monthly data from the station under test and other neighbouring climate stations with good quality records (and no site changes during the comparison period). Obtain corrections to the temperature series for the station under test. It should be noted that the homogenisation procedure uses comparison periods of monthly data  $\pm 2$  or  $\pm 4$  years before and after a suspected (or actual) site change, or discontinuity in the temperature series and statistically tested for significant changes. Comparisons were also made using annual values for the entire overlapping period of record with a neighbour station (Salinger, 1981).