Climatic data. Temperature and precipitation data for typical stations in various districts are shown in Table 1.7. Additional data from hundreds of stations and reports concerning the climates of Canada and the regions are available from the Atmospheric Environment Service, Department of Fisheries and the Environment. Definitions, methods of observation, the instrumentation used and other information are included in the department's publications.

1.3.2 Standard time and time zones

The rotation of the earth on its axis was once considered uniform and the unit of time, the second, was defined as 1/86400 of the mean solar day. Improvements in clocks and in methods of making astronomical observations demonstrated conclusively that there are irregularities in earth rotation too large to be neglected. In 1956 the International Committee on Weights and Measures defined the second in terms of the annual motion of the earth about the sun, called ephemeris time. In 1957 the first cesium atomic clock was calibrated with respect to ephemeris time; in 1967 the cesium second was adopted as the international standard. The second now is defined as the duration of 9,192,631,770 periods of the radiation corresponding to a transition of the cesium atom.

Based on atomic clocks, Canada's time is established by the National Research Council with a precision of one ten-millionth of a second per day, and coordination with other countries is maintained to the same precision through the Bureau international de l'Heure in Paris. Irregularities in the rotation of the earth give rise to a difference between mean solar time and atomic time, and a leap second is introduced to ensure that this difference, called DUT1, does not exceed 0.8 seconds. At present DUT1 is decreasing by about one twelfth of a second per month, and positive leap seconds were necessary on June 30, 1972 and on December 31, 1972, 1973, 1974 and 1975.

A continuous broadcast of Canadian time is made on station CHU, Ottawa (3330 kHz, 7335 kHz, 14670 kHz), with a bilingual voice announcement each minute, and with a split pulse code to give the value of DUT1. Once a day the time signals are broadcast across Canada on the CBC networks.

Standard Time, adopted at a World Conference at Washington, DC in 1884, sets the number of time zones in the world at 24, each zone ideally extending over one twenty-fourth of the surface of the earth and including all the territory between two meridians 15° of longitude apart. In practice, the zone boundaries are quite irregular for geographic and political reasons. Universal Time (UT) is the time of the zone centred on the zero meridian through Greenwich. Each of the other time zones is a definite number of hours ahead of or behind UT to a total of 12 hours, at which limit the international date-line runs roughly north-south through the mid-Pacific.

Canada has six time zones. The most easterly, Newfoundland Standard Time, is three hours and 30 minutes behind UT, and the most westerly, Pacific Standard Time, is eight hours behind UT. In between, from east to west, the remaining zones are called Atlantic, Eastern, Central and Mountain. On October 28, 1973, the nine hour Western Yukon Time Zone was eliminated by order of the Yukon Territorial Council, placing the entire Yukon eight hours behind UT.

Legal authority for the time zones. Time in Canada has been considered a matter of provincial rather than federal jurisdiction. Each of the provinces and territories has enacted laws governing the standard time to be used within its boundaries. These laws determine the location of the time zone boundaries. Lines of communication, however, have sometimes caused communities near the boundary of a time zone to adopt the time of the adjacent zone, and in most cases these changes are acknowledged by amendments to provincial legislation. During the two World Wars, there were federal enactments concerning time but these were of temporary duration. In 1941 the time determined at the Dominion Observatory was designated as official time for Dominion official purposes. On April 1, 1970, this became the responsibility of the National Research Council.