

and high plateaus with marked day to night temperature contrasts. Interior Canada, from the Rocky Mountains to the Great Lakes, has a continental-type climate with long cold winters, short but warm summers and scanty precipitation. Southern portions of Ontario and Quebec have a humid climate with cold winters, hot summers and generally ample precipitation all year. The four Atlantic provinces have a humid continental-type climate although in the immediate coastal areas there is a marked maritime effect. On the northern islands, along the Arctic Coast and around Hudson Bay, arctic conditions persist, with long frigid winters and only a few months with temperatures averaging above freezing. Precipitation is light in the tundra area north of the treeline. Between the arctic and southern climates boreal Canada has a transitional type climate with bitter long winters but appreciable summer periods. Precipitation is light in the west, but heavier in the Ungava Peninsula.

**Climatic data.** Temperature and precipitation data for 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 of the fisheries and environment department. Definitions, methods of observation, the instrumentation used and other information are included in the department's publications.

## Time zones

## 1.4

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 co-ordination 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 of each year from 1972 to 1977.

A continuous broadcast of Canadian time is made on station CHU, Ottawa (3 330 kHz, 7 335 kHz, 14 670 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, England. 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. From east to west, the remaining zones are called Atlantic, Eastern, Central and Mountain. In October 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 of provincial rather than federal jurisdiction. Each of the provinces and territories has enacted laws governing standard time and these laws determine 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. Official time for dominion official purposes is the responsibility of the National Research Council of Canada.

**Daylight saving time.** Most provinces have legislation controlling the provincial or municipal adoption (or rejection) of daylight saving time; in the other provinces