wide north-south corridor open to rapid air flow from either north or south which often brings sudden and drastic weather changes to this interior area. On the other hand, the large water surfaces of eastern Canada produce a considerable modification to the climate. In southwestern Ontario winters are milder with more snow, and in summer the cooling effect of the lakes is well illustrated by the number of resorts along their shores. On the east coast, the Atlantic Ocean has considerable effect on the immediate coastal area where temperatures are modified and conditions made more humid when the winds blow inland from the ocean.

Table 1.7 gives temperature and precipitation data for typical stations in the various regions of Canada. Temperatures refer to observations taken in a thermometer shelter which has been placed in a representative location with the thermometer bulbs four feet above the surface of the ground. Mean January and July temperature data are based on records over the 30-year period from 1941 to 1970 except for far northern stations where the available period of record is shorter. After an average temperature is obtained for each day in January over a 30-year period, the mean January temperature may be arrived at by striking a mean of these 930 daily values. The mean July temperature may be obtained in a similar manner. The highest and lowest temperatures on record refer to the absolute extremes for the entire period of record at each station. Average dates are shown for the last occurrence in spring of a temperature of 32°F or lower and for the first occurrence in autumn of freezing temperatures at the four-foot level in the thermometer shelter.

The official Canadian rain gauge is a small cylinder in which the rain is caught and then measured to one hundredth of an inch with a simple measuring device. Freshly fallen snow is measured as it lies on the ground and recorded to the tenth of an inch. Total precipitation values shown in Table 1.7 are the sum of the total rainfall plus one tenth of the snowfall except that at airports the actual water equivalent of the snow has been measured since about 1960 in a specially designed gauge. For the purposes of this Table, a day with precipitation is one on which at least one hundredth of an inch of rain or one tenth of an inch of snow has fallen.

1.3.2 Meteorology

Meteorology, the science of the atmosphere, includes studies of the physics, chemistry and dynamics of the atmosphere and also investigates the direct effect of the atmosphere on the earth's surface, the ocean and life in general.

The federal government has been continuously involved in providing meteorological services to Canadians for over a century. The Atmospheric Environment Service is the scientific service-oriented organization which seeks to stimulate the application of meteorology to meet national needs and, through employment of new scientific knowledge and technological advances, to develop, expand and improve Canadian meteorological services to meet changing requirements for these services. The most rapid growth of meteorology in Canada was closely linked to the growth in aviation, both civil and military, during the period 1935-60. In more recent years, other sectors of the Canadian economy – industry, including agriculture, utilities, tourism, recreation and environmental problems – are claiming greater attention.

The headquarters of the Service is located at Toronto. Services provided to meet civil requirements throughout Canada are largely decentralized to regional offices located at Vancouver, Edmonton, Winnipeg, Toronto, Montreal and Moncton. Each region operates several categories of offices with assigned levels of responsibility for providing weather services for the general public with additional specialized services for groups and agencies concerned with aviation, water resources, forestry, agriculture, road and rail transportation, construction and marine services.

Scientific Support Services groups have been established recently at regional offices which are capable of examining in detail the effects of weather on the activities of major sectors of the economy and of developing specialized services that might be required. For example, in British Columbia, provincial authorities and the regional office in Vancouver have worked together to arrange programs of considerable provincial importance, including the establishment of rain and snow gauge networks for hydrology studies, support for the Columbia River control system, provision of forest fire danger and slash-burning forecasts, and the provision of a frost-warning service for the fruit growing areas of the interior.

In general the weather information provided deals with current weather, expected weather and past weather in historical and statistical form. Current weather information takes