

the environmental impact of both industry and modification to established facilities and as a result of the growing realization of the importance of meteorological factors in determining the effects of pollutant emissions on air quality.

Within the next year, as part of a commitment to the World Meteorological Organization's global monitoring network, three baseline stations at remote Arctic and oceanic sites and seven regional stations at rural locations will be established. In addition, a national network of urban reference stations, one for each large city, will be established over the next five years. The observational program will include not only the standard meteorological elements but also precision measurements of the concentrations of various particulate and gaseous pollutants, the chemical constituents of precipitation, turbidity and the downward components of radiation. Special air pollution research networks will also be operated from time to time for testing physical and numerical models. In this connection, the co-operation of the provinces will be sought to exchange suitable data.

Environmental research. Research studies on cloud and precipitation mechanisms were continued, partly to increase knowledge in this field but also with the objective of discovering possible modification techniques. These studies have strong implications for economic benefits as more and more successful modification techniques are discovered. Experimental seeding of hailstorms in Alberta in 1972 produced encouraging results, as did local experiments on the dispersal of fog such as that which hampers transportation at airports and on inland marine routes. Basic studies on the mechanisms of cloud formation and precipitation development were also continued with an eye to possible rainfall augmentation techniques.

Field and laboratory studies continued on means of identifying, locating and tracking lightning-producing storms, the aim being to assist forestry interests to combat forest fires and to assist other agencies where precautionary measures would result in significant savings either to persons or property.

Work continued on increasing the effectiveness of radar to observe and differentiate storm details. Equipment and techniques were developed and improved to calibrate, record and archive weather radar observations for effective use as a "radar rain-gauge". Other studies involved the measurement of atmospheric electricity variables and studies of their correlation with meteorologic phenomena, also laser/radar applications to meteorology.

Theoretical study was made of the effect of atmospheric parameters on the occurrence and extent of the sonic boom generated by aircraft flying supersonically.

Work continued on improving the performance of the lysimeter. A successfully modified soil moisture control system was designed and installed. In order to operate the lysimeter in severe winter conditions, a device was developed and installed to prevent ice formation and snow accumulation in the gap between the lysimeter and the retaining wall.

In a co-operative research program with the Ontario Ministry of Agriculture and Food in connection with frost protection of vineyards, frequency and strength of inversions at three sites in the Niagara Peninsula were continuously measured. Experiments were also conducted to bring down warm air from aloft using helicopters to stir the air at a height of about 75-100 ft.

Work was carried out on evaporation from sunken and non-sunken class A pans to determine their energy components in order to arrive at the most important meteorological parameters for reduction of data to open water evaporation.

Hydrometeorological studies contribute to greater efficiency in the design and operation of dams, sewer systems and other water control structures; improved forecasting of lake and river levels, floods, water supply and irrigation requirements; and more efficient design and operation of hydro-electric power developments. Work continued on improving estimates of the distributions of precipitation, evapotranspiration and snowpack water content using surface instrumentation and remote sensing techniques. Progress was made in the development of mathematical models of water balances and energy balances involving meteorological data and hydrological applications. Efforts were directed to studying the effects of man on the hydrologic cycle and the resultant spectrum of water-related environmental management problems. Much of this work was carried out in support of federal-provincial projects and the International Hydrological Decade.

Studies of atmospheric processes in the earth's atmosphere boundary layer, that layer of the atmosphere from the surface up to a few thousand feet, are of importance in such fields as agriculture, forestry, oceanography, weather forecasting, etc. Study topics include: wind and