

Experimental prototypes of an acoustic radar have been successfully tested and further development toward operational equipment is started. This equipment, termed SODAR, transmits a pulse of acoustic energy upward and the sonic backscatter from small temperature irregularities in the atmosphere is detected and graphically depicted. The ultimate use which is visualized for this equipment is to provide a continuous indication of the stability structure of the lower levels of the atmosphere for possible use in the control and prediction of atmospheric pollution accumulation.

A number of types of optical scatter instruments are being evaluated under operational conditions as automatic station sensors for meteorological visibility for all types of observants. One type has been recommended for use in current applications. The handling of large quantities of data quickly is only feasible by means of computers. Investigations are under way to determine the techniques involved in moving the sensor outputs directly and automatically into the computer, thus eliminating the present intermediate handling and processing steps which may involve manual operations or complex analogue devices.

9.2.6.2 Forestry research

The responsibility of the federal government for forestry research and development is defined and established by the Forestry Development and Research Act (1966) and the Department of the Environment Act (1970). The primary federal organization concerned with forestry is the Canadian Forestry Service of the Department of the Environment. Within the Canadian Forestry Service there are six regional forest research centres, four forest research institutes, two forest products laboratories and one independently operating forest experiment station. Collectively, these establishments undertake research and operations either on a regional or a national basis.

Essentially, the program of the Canadian Forestry Service is concerned with research and development related to systems of forest management, forest protection, and forest utilization as well as to the use of forest products. Within this framework, the present trend is to place less weight on research concerned with production forestry and more emphasis on environmental and amenity forestry studies. This situation is a response to a recognized need for Canada's forests to provide and safeguard values additional to the traditional ones of wood and fibre. It constitutes acceptance of the principle of integrated resource management whereby such important matters as water, wildlife, and recreation become part of over-all long range forestry plans.

Production forestry research. In this broad area of research, current objectives include the matter of establishing trees in the most efficient manner. This covers methods of producing tree seeds and seedlings as well as ways of reforestation or afforestation and upgrading the genetic quality of planting stock. Another important area is related to managing the forest to achieve optimum growth and quality. Closely associated with this is the matter of research and forecasting activities to prevent, detect, and control insect and disease outbreaks as well as forest fires.

Considerable emphasis is placed on improving and demonstrating practical means of reducing the costs of harvesting and transporting the forest crop because a large part of the final value of wood products relates to costs which have accumulated by the time the logs reach the mill. In this area it is noteworthy that, in 1974, the Forest Engineering Research Institute of Canada — Institut Canadien de Recherches en Genie Forestier was incorporated to carry out research and development work in the areas of harvesting and transportation of wood. The Institute has brought together elements of logging research activity formerly located within the Canadian Forestry Service and the Pulp and Paper Institute of Canada. Its operations are jointly financed by the federal government and forest industry companies.

Greater efficiency in the utilization of the forest resource is a matter of current concern. In this area there is involvement with methods of processing under-utilized trees, improving mechanical processing of wood, evaluating log quality, improving gluing methods, and determining the paper making qualities of various tree species as well as parts of trees currently unused. Concern over the rate of depletion of certain non-renewable resources has prompted a greater interest in applications for wood and considerable work is in progress on new and improved wood products. This is largely confined to the forest product laboratories located in