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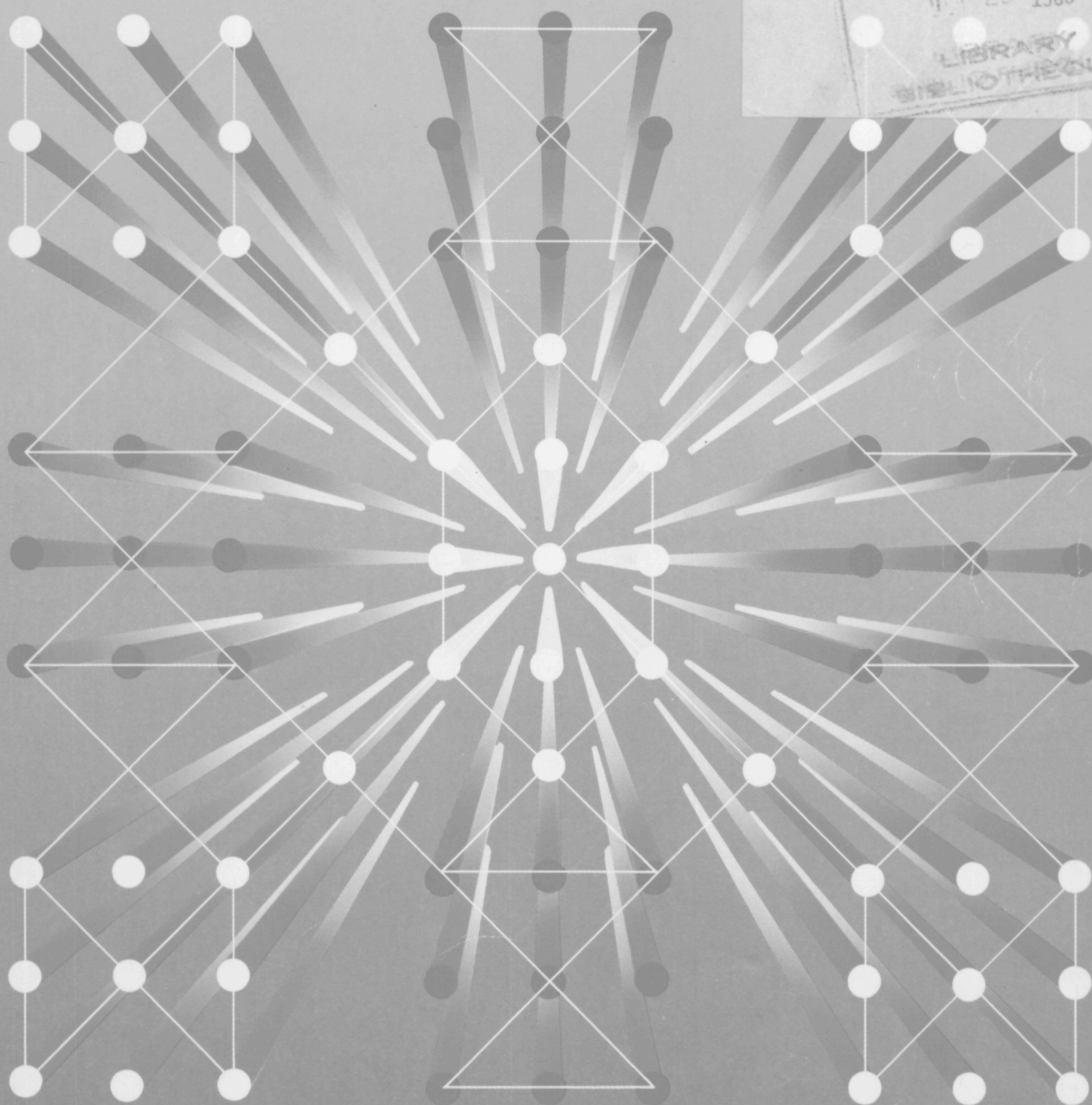
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Science, Technology and  
Capital Stock Division

Division des sciences, de la technologie  
et du stock de capital

# Directory of Federal Government Scientific & Technological Establishments, 1985



Canada

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Statistics Canada  
Science, Technology and Capital Stock Division

# **Directory of Federal Government Scientific & Technological Establishments, 1985**

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## FOREWORD

Statistics Canada has frequently been asked to provide a directory which would not only serve as a record of scientific research and experimental development (R&D) facilities in Canada, but also help persons to locate R&D establishments capable of assisting them with their problems and requirements. The National Research Council, in particular, has encouraged Statistics Canada to provide such a directory.

The Science, Technology and Capital Stock division is now compiling an inventory of units performing R&D in Canada: the data base will contain descriptive information on each unit such as the R&D being performed, specialized equipment, and the number of scientists and engineers, as well as identifying information such as institutional name, address, and name of contact person.

The data base is being developed in three segments: industrial facilities, university-affiliated research institutes and federal government establishments. Data for the industrial segment has been released as *Industrial Research and Development Facilities in Canada, 1985*, Catalogue No.88-205 E. A directory of university-affiliated centres is expected to be released in the fall. This report contains the first attempt to provide descriptive information on federal establishments carrying out scientific and technological activities.

We are grateful to the departments and agencies who contributed many person-hours completing the questionnaires. Recognition is given to all those who worked directly or indirectly to the preparation of this directory, especially Mary-Lynne Redmond, Lorna Bailie and Janet Thompson. Suggestions are invited, from participating departments or other users, on the format or content of the directory.

This publication was prepared by Bert Plaus, Project Leader, Public Sector, under the direction of Humphrey Stead, Chief, Science and Technology Statistics, and Peter Koumanakos, Director, Science, Technology and Capital Stock Division.

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## INTRODUCTION

This is a list of all federal establishments engaged in activities in the natural sciences and engineering, as reported in late 1984 by departments and agencies of the Federal Government. A *scientific establishment* is considered to be a unit or group of units, with a budget and at one location, which performs scientific activities.

UNESCO defines scientific and technological (S&T) activities as "...systematic activities which are closely concerned with the generation, advancement, dissemination and application of scientific and technical knowledge in all fields of science and technology".

The scientific and technological activities covered are divided into six. Research and development (R&D) is creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new application. The other five, collectively termed "Related Scientific Activities" (RSA), are technical surveys, education support, information services, special services and studies and museum services.

The main body of the directory is divided into three sectors. The first lists the establishments involved in the performance of S&T activities. The second sector lists establishments involved in the funding of S&T activities (e.g. Granting Councils) and the third lists establishments with a supporting or administrative role to S&T activities. The establishments are displayed alphabetically by department; a regional index is available only for establishments performing S&T activities.

We would be grateful for notification of errors and omissions, as well as suggestions concerning the presentation.

Please forward any comments to:

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Science and Technology Statistics Section,  
Science, Technology and Capital Stock Division,  
STATISTICS CANADA,  
Ottawa, Ontario K1A 0T6



## **PERFORMING ESTABLISHMENTS**



## AGRICULTURE CANADA

### **Animal Diseases Research Institute: Lethbridge**

P.O. Box 640, Lethbridge, Alberta T1J 3Z4

Contact: Mr. M.J. Gaffney, Administrative Officer, Tel: (403) 381-8182

Personnel: Total is 54.

Activities: Research is mainly focused on respiratory, reproductive and neonatal problems in beef cattle with particular emphasis on the role and interaction of viruses, bacteria and mycoplasmas as well as the comparative relationships between management and disease in intensive and prairie rearing production systems. Other research projects include studies on bovine herpes virus, leptospirosis, scrapie, clostridial diseases, and Arctic fox rabies. Disciplines involved are pathology, bacteriology, virology, immunology, clinical research. Diagnostic test service in these disciplines are also provided in support of federal disease control, eradication and certification programs in Western Canada.

Facilities: Large animal environmental chamber.

### **Animal Diseases Research Institute: Nepean**

801 Fallowfield Road, P.O. Box 11300, Nepean, Ontario K2H 8P9

Contact: Dr. Barry Sternshom, Director, Tel: (613) 998-9320

Personnel: Total is 221.

Activities: This institute has expertise in the disciplines of veterinary microbiology, immunology, pathology, and reproductive pathophysiology. Basic and applied research is conducted to improve the diagnosis, prevention and/or control of zoonotic and foreign animal diseases such as rabies, brucellosis, African swine fever and bluetongue. Also studied are selected indigenous diseases which cause high losses to productivity or impede international trade opportunities. The Institute conducts laboratory tests to support national disease control and eradication programs, to support the international export of Canadian livestock, to prevent entry of foreign animal diseases into Canada and to certify the parentage and blood type of cattle and horses. It is the national centre for foreign animal disease diagnosis and produces diagnostic reagents used in Canada and internationally for livestock disease diagnosis.

Facilities: Biological containment facilities (MRC levels C and D) for laboratory animals, livestock and veterinary biologics production.

### **Animal Pathology Laboratory: Guelph**

620 Gordon Street, Guelph, Ontario N1G 1Y4

Contact: Dr. T.R.S. Bhatia, Director, Tel: (519) 822-3300

Personnel: Total is 24.

Activities: Activities at this laboratory are mainly concentrated on diagnosis and research. Research is focused on meat microbiology, methodology development so that tests for diagnostic functions could be improved and implemented. Research is also being conducted on salmonella infection and contamination of livestock. In the salmonella research use of biotechnology (genetic engineering) is being exploited.

Facilities: Ultra-Centrifuge - highly specialized microscope, specialized incubator.

### **Animal Pathology Laboratory: St-Hyacinthe**

3000 Sicotte Street, St-Hyacinthe, Québec J2S 2L8

Contact: Dr. André N. Gagnon, Director, Tel: (514) 773-7730

Personnel: Total is 13.

Activities: Over the next three years (1985-1988), the laboratory will be completely reorganized. At present, its activities are confined to certain diagnostic procedures for the detection of bacterial contamination in meat and meat products and support for some eradication and exploration programs. In the medium term, the laboratory will be assigned additional responsibilities involving research primarily in the area of porcine diseases.

### **Animal Pathology Laboratory: Saskatoon**

116 Veterinary Road, Saskatoon, Saskatchewan S7N 2R3

Contact: W.D.G. Yates, Director, Tel: (306) 665-5350

Personnel: Total is 38.

Activities: This laboratory, which is located on the campus of the University of Saskatchewan, contains two sections; chemical residue analysis and infectious diseases. The chemical residue analysis section is concerned with diagnosis and research in the detection of potentially harmful chemical residues in meat and meat products. The infectious diseases section performs diagnostic and research activities on brucellosis and other diseases affecting domestic animals and also their interaction with wildlife species. Disciplines involved in these programs include chemistry, biochemistry, bacteriology, immunology and pathology.

Facilities: Mass Spectrometer, atomic absorption spectrophotometer, gas and high performance liquid chromatographs.

### **Animal Pathology Laboratory: Sackville**

P.O. Box 1410, Sackville, New Brunswick E0A 3C0

Contact: Dr. R.G. Stevenson, Director, Tel: (506) 536-0135

Personnel: Total is 18.

Activities: The laboratory is involved in bacteriological, histopathological and virological studies to improve diagnostic procedures in bovine/ovine, and poultry diseases; in studies on the pathogenesis of ovin pneumonia and in parasitological research on trichinosis in swine and other animals, including wild animals. Although research and diagnostic work is conducted on diseases of several animal species, emphasis is placed on ovidae. The diagnostic function is in support of the livestock industry and regulatory agencies.

**Animal Pathology Laboratory: Vancouver**

3802 West 4th Avenue, Vancouver, British Columbia V6R 1P5

Contact: Dr. Wm.J. Dorward, Director, Tel: (604) 732-4393

Personnel: Total is 7.

Activities: The laboratory operates primarily as a diagnostic centre by providing serological, bacteriological and virological functions to support the livestock industry and branch program. Migratory waterfowl are also monitored for the presence of exotic viruses.

Facilities: Type "C" bio-containment.

**Animal Pathology Laboratory: Winnipeg**

408 Federal Building, 269 Main Street, Winnipeg, Manitoba R3C 1B2

Contact: Dr. R.C. Finlay, Director, Tel: (204) 949-2205

Personnel: Total is 9.

Activities: This laboratory is involved in diagnostic procedures in the fields of serology and bacteriology. The serology section is involved in Brucellosis and E.I.A. diagnosis while the bacteriology activities involve the diagnosis of contamination of meat and meat products and the identification of Salmonella and Campylobacter bacteria. The functions of the laboratory support the Livestock Industry and regulatory agencies.

**Animal Research Centre**

Ottawa, Ontario K1A 0C6

Contact: Dr. R.S. Gowe, Director, Tel: (613) 993-6002

Personnel: Total is 271.

Activities: Research at the Animal Research Centre is mission oriented and is directed toward solving high priority problems arising from domestic animal and poultry production and to developing advanced systems to meet future trends within the Canadian animal agricultural industry. The Centre's chemical laboratories and administrative headquarters are located on the Central Experimental Farm. On the 1200 hectare Research Farm, in the Ottawa suburbs, modern facilities are available to house dairy cattle, sheep, swine, poultry and various laboratory animals as required for extensive and intensive research by a multidisciplinary staff of 50 scientists. In addition a feed mill and facilities for surgery and radioisotope use with large animals are available. Programs include the study of problems of intensively housed and managed livestock and poultry; research on feedstuff contaminants (mycotoxins); application of biotechnology in agricultural production. High priority is placed on the transfer of research results from the laboratory to the farmer-user.

**Biosystematics Research Institute**

K.W. Neatby Building, Carling Avenue, Ottawa, Ontario K1A 0C6

Contact: Mr. G.A. Mulligan, Director, Tel: (613) 996-1665

Personnel: Total is 125.

Activities: The Institute provides the National Identification Service for insects, fungi, arachnids, nematodes, and vascular plants, this is utilized by clients throughout Canada. Extensive research is conducted in biosystematics, taxonomy, faunistics, floristics, and evolution. The Institute is the custodian of the National Collection of Insects and Arachnids, the National Mycological Herbarium, the Canadian National Collection of Nematodes, and CDA Vascular Plant Herbarium. Excellent library facilities particularly in the area of plant, insect, arachnid, and nematode systematics are available.

**Canadian Grain Commission - Grain Testing and Research**

600-303 Main Street, Winnipeg, Manitoba R3G 3G8

Contact: N. Syzek, Budget Financial Analyst, Tel: (204) 949-2783

Personnel: Total is 95.

Activities: Conduct quality survey, varietal studies and perform basic and applied research on new grain crops and on grains marketed.

Facilities: Grain pilot mill.

**Chemistry and Biology Research Institute**

K.W. Neatby Building, Carling Avenue, Ottawa, Ontario K1A 0C6

Contact: Dr. I. de la Roche, Director, Tel: (613) 995-3700

Personnel: Total is 97.

Activities: Present research objectives are concerned with the development of effective and environmentally acceptable methods of weed and fungus control by pesticides; the development of analytical methodology to establish safe levels of fungal toxins in food and feedstuffs and to provide effective measures of decontamination and control; the increase of the nitrogen-fixing capability of forage legumes through selection and genetic engineering of the bacterial symbiont and host improvement; the epidemiology and transmission of virus and mycoplasma diseases of plants in relation to disease incidence, management and control; the efficient use of soil nitrogen; the prevention of soil organic matter losses, and the mineralogy of Canadian soils; the provision of new knowledge on the mechanisms of cold acclimation, freezing injury and overwintering damage in relation to the development of crop plants, resistant to environmental stresses. The Institute also provides a comprehensive electron microscope service, analytical chemistry service, and mineral analyses service for Research Branch establishments across Canada.

**Engineering and Statistical Research Institute**

Building # 94, Central Experimental Farm, Ottawa, Ontario K1A 0C6

Contact: Mr. P. Voisey, Director, Tel: (613) 995-5179

Personnel: Total is 99.

Activities: The Institute provides services in engineering and biometrics. Research is carried out in five main areas:  
BIOMETRICS - experimental design, statistical analysis, software development and interpretation of data; AGRICULTURAL  
ENGINEERING - restricted to mechanization of minor horticultural crops and design of farm buildings (development of a

range of machines for farm use); **ENERGY ENGINEERING** - for the conservation and production of energy across the agrifood system, primarily by contracting-out R&D; **FOOD ENGINEERING** - to develop new unit processes and equipment to improve production efficiency and quality, particularly for new commodities; **ENGINEERING DEVELOPMENT** - of new equipment for research and food inspection operations. The Institute provides advice in these areas and on a wide range of problems in engineering and statistics. Spectroscopic equipment has been developed and applied to remote sensing of biological phenomena. A spectroradiometer for individual plant studies and an open path CO<sub>2</sub> greenhouse control have been developed.

**Experimental Farm: Fort Vermilion**

Fort Vermilion, Alberta T0H 1N0

Contact: Mr. B. Siemens, Superintendent, Tel: (403) 927-3253

Personnel: Total is 10.

Activities: The Experimental Farm at Fort Vermilion is the most northerly component of Agriculture Canada's northern research group and, together with Beaverlodge, is historically and traditionally associated with frontier and development type of northern agriculture. Research activities include studies of the effect of climate on seeding dates, and fertilizer rates for cereal, oilseed and forage crops.

**Experimental Farm: Indian Head**

Indian Head, Saskatchewan S0G 2K0

Contact: Mr. M. Maw, Officer - in Charge, Tel: (306) 695-2274

Personnel: Total is 20.

Activities: The experimental farm at Indian Head has an excellent land resource for expanded work in agronomy and weed control of cereal, oilseed and other field crops. It is the only test site for southern Saskatchewan where field crop recommendations can be developed. Much of the work done here involves services to other research stations and includes evaluation of new lines and varieties of cereal, oilseed and other field crops (buckwheat, fababeans, field peas, lentils, canary seed).

**Experimental Farm: Kamouraska**

P.O. Box 400 La Pocatiere, Kamouraska, Québec G0R 1Z0

Contact: Mr. J.E. Comeau, Superintendent, Tel: (418) 856-3141

Personnel: Total is 39.

Activities: The experimental farm at LaPocatiere is responsible to the Research Station at Ste-Foy, Quebec and carries out programs on cereals, forage crops, potatoes and tree fruits.

**Experimental Farm: Kapuskasing**

Kapuskasing, Ontario P5N 2X9

Contact: Dr. J. Proulx, Superintendent, Tel: (705) 335-6148

Personnel: Total is 25.

Activities: The experimental farm at Kapuskasing conducts experiments on crop production and beef cattle management, in cooperation with the Animal Research Centre (Ottawa), for northwestern Quebec and northeastern Ontario. The program emphasizes forage and cereal management, including maximum harvest times and optimum seeding rates.

**Experimental Farm: L'Assomption**

P.O. Box 1070, L'Assomption, Québec J0K 1G0

Contact: M. F. Darisse, Superintendent, Tel: (514) 589-4775

Personnel: Total is 31.

Activities: The experimental farm at L'Assomption and its sub-station at Lavaltrie, are concerned with the production of cigarette and cigar tobacco. Research on ornamental trees and shrubs is also conducted at L'Assomption, and the farm collaborates with the St-Jean Station in the production of insect and disease-resistant strains of corn grown for grain.

**Experimental Farm: Nappan**

Nappan, Nova Scotia B0L 1C0

Contact: Mr. F.W. Calder, Superintendent, Tel: (902) 667-3827

Personnel: Total is 33.

Activities: Research programs are concerned with the management of beef, sheep, and swine, and on their nutrition and feed crops requirements.

**Experimental Farm: Normandin**

1472 Saint Cyrville Street, Normandin, Québec G0W 2E0

Contact: M. J.M. Wauthy, Superintendent, Tel: (418) 274-3378

Personnel: Total is 25.

Activities: The experimental farm at Normandin is responsible to the Research Station at Ste-Foy, Quebec and carries out programs concerned with evaluating lines and varieties of forage crops, cereal crops, and some small fruits.

**Experimental Farm: Prince George**

R.R. #8, R.M.D. #6, Prince George, British Columbia V2N 2H8

Contact: Mr. W.L. Pringle, Superintendent, Tel: (604) 963-9632

Personnel: Total is 14.

Activities: Assists the Kamloops Research Station in servicing the diverse rangelands of interior British Columbia.

**Experimental Farm: Thunder Bay**

P.O. Box 158, Postal Station F, Thunder Bay, Ontario P7C 4V8

Contact: Mr. J. Wilson, Superintendent, Tel: (807) 939-2523

Personnel: Total is 6.

Activities: The experimental farm at Thunder Bay is engaged in methods of crop production, particularly potatoes, for northwestern Ontario.

**Food Research Institute**

Central Experimental Farm, Ottawa, Ontario K1A 0C6

Contact: Dr. N. Tape, Director, Tel: (613) 995-5362

Personnel: Total is 65.

Activities: FRI is the largest public sector establishment dedicated to food research. Research programs are in effect in the following areas: Processing Technology - Effects of processing on the chemical and physical properties of foods; sensory and objective evaluation of foods; functional properties of food ingredients; microstructure of foods; chemistry of food carbohydrates, polysaccharides, proteins and lipids; mechanisms of thermal, chemical and enzymatic gelation. Ingredients and New Product Development - Isolation and characterization of components from agricultural raw materials; innovations in food processing techniques; development of new processes to prepare food ingredients and prototype food products. Food Safety and Nutrition - Microbial populations in cured meats; mechanisms of nitrite action in meats; qualitative and quantitative analysis of vitamins and nutrients of food and food ingredients; control of micro-organisms in relation to the quality, safety and preservation of foods; effects of processing on the nutritive value of foods.

**Food Research Station**

3100 boulevard Laframboise, Suite 103, St-Hyacinthe, Québec J2S 4Z4

Contact: Dr. R.R. Riel, Director, Tel: (514) 773-5771

Personnel: Total is 1.

Activities: Henceforth to 1988 to provide to industry technology for the preparation, transformation and conservation of quality meat, dairy and vegetable products to meet the needs of consumers.

**Forest Pest Management Institute**

1219 Queen Street East, P.O. Box 490, Sault Ste. Marie, Ontario P6A 5M7

Contact: Dr. G. Green, Director, Tel: (705) 949-9461

Personnel: Total is 87.

Activities: The Institute is devoted exclusively to the development of efficacious and environmentally acceptable pest management strategies that will assist forest managers in the achievement of forest management objectives. The Institute's Research and Development program is broad and complex. It includes the development of improved or new chemical insecticides and herbicides; biological control agents, such as bacteria, viruses, fungi and protozoa; and insect pheromones and growth regulators. A significant part of the program is concerned with development of equipment and technology for applying pest control materials accurately and effectively to the target of assessing the environmental impact of products and strategies developed and at elucidation of the persistence, dynamic cycling and ultimate fate of pesticides and their breakdown products in the environment. Research complementary to the foregoing is concerned with cellular biology, immunology, tissue culture and systems analysis. In these areas, the Forest Pest Management Institute plays the lead role within the Canadian Forestry Service but works cooperatively with other Canadian Forestry Service regional forest research centres, provincial forestry agencies and other cooperators.

Facilities: The Institute is well equipped with standard instrumentation to allow research to proceed in the foregoing fields. In addition to the basic equipment required for the above, the Institute has an electron microscope, mass spectrophotometer, GC's, HPLC's, and other analytical equipment, spray chambers, a research spray aircraft, extensive insect, plant and pathogen production facilities and production and research greenhouses.

**Forestry Systems and Statistics Branch**

Chalk River, Ontario K0J 1J0

Contact: Jim McManus, Financial Officer, Tel: (613) 995-7010

Personnel: Total is 26.

Activities: Reports on the inventory of forest lands in Canada including; areas, volume, biomass, growth and depletion. Reports on changes to Canada's forests including fire harvesting forest management. Develops and operates computer systems for the analysis and display of forest data.

**Great Lakes Forest Research Centre**

1219 Queen Street East, P.O. Box 490, Sault Ste. Marie, Ontario P6A 5M7

Contact: Mr. J.H. Cayford, Regional Director, Tel: (705) 949-9461

Personnel: Total is 167.

Activities: The Great Lakes Forest Research Centre is one of six regional forestry centres operated by the Canadian Forestry Service. It is involved in a program of forest research and regional forestry development in Ontario, and provides the primary federal focus for forestry in Ontario. A large portion of the research program is concerned with long-term wood supply. Various forest renewal projects are under way, with emphasis on black spruce ecosystem silviculture. Substantial efforts are also directed at the reduction of losses from insects, diseases and fire. A major cooperative project that involves other elements of Environment Canada as well as various provincial and federal agencies deals with the impact of long-range transport of air pollutants on forest ecosystems. The forestry development program is involved in negotiating and administering federal-provincial cost-sharing agreements with the province of Ontario, conducting economic studies, and implementing job creation programs in the forest sector.

Facilities: Gas Chromatograph; Atomic Absorption Spectrometers; Nitrogen Analyzer; Ion Chromatograph; Autoanalyzers; Freezer; Drier; Alkalinity Meter; Titroprocessor; pH Meters; Conductivity Meter; Carbon Analyzer; Auto-clave; Sterilizers; Nikon



Photo-micrograph; Varian Universal Heaters; Oscilloscope; Portable Photosynthesis System; Sartorius Balances; Vax 750 Computer System and accessories; Microloggers.

#### **Laboratory Services Division**

Building 22, C.E.F., Ottawa, Ontario K1A 0C6

Contact: Dr. W.P. Cochrane, Director, Tel: (613) 995-4907

Personnel: Total is 111.

Activities: This laboratory provides physical, chemical and biological testing services in support of inspections, quality and safety assurance programs of the Food Protection and Inspection Branch on food products (meat, egg, dairy, fruit and vegetable products) and agricultural inputs (feeds, fertilizers, seeds and pesticides). Analytical methodology research is conducted in order to maintain state-of-the-art quality service on a timely and reliable basis.

Facilities: High and low resolution GC/Mass Spectrometers for low level micro-contaminant analysis of residues.

#### **Land Resource Research Institute**

K.W. Neatby Building, Carling Avenue, Ottawa, Ontario K1A 0C6

Contact: Dr. J.S. Clark, Director, Tel: (613) 995-5011

Personnel: Total is 167.

Activities: The Land Resource Research Institute (LRRI) has responsibility for national programs in land resources and agrometeorologic services. The programs of the Institute include the national soil survey program, a supporting program in soil classification research, a program involving studies in land evaluation agricultural land use and soil degradation, and an agrometeorological program that includes agrometeorological services, farm weather service, crop-weather modelling, and crop information. The Institute is organized on a regional basis, with soil survey units located in each of the provinces where cooperative survey work is carried out. The central group in Ottawa is responsible for national correlation and map production, and research in the various aspects of soil, water, and agrometeorological disciplines.

#### **Laurentian Forest Research Centre**

1080 Route du Vallon, Québec City, Québec G1V 4C7

Contact: Jacques Cote, Financial Agent, Tel: (418) 694-4991

Personnel: Total is 139.

Activities: Systems analysis applied to forestry and related disciplines and computer simulation models including optimization by dynamic programming, of individual trees, stands, and of management strategies. Remote sensing as related to forest stand inventory. Insect pathology; epidemiology, ecology, population dynamics and biological control of forest insects, particularly the spruce budworm and the gypsy moth.

#### **Maritimes Forest Research Centre**

College Hill, P.O. Box 400, Fredericton, New Brunswick E3B 5P7

Contact: Donald M. Thorpe, Regional Financial Officer, Tel: (506) 452-3557

Personnel: Total is 195.

Activities: The centre carries on a broad program of research in all forestry and forestry-related disciplines, seeking solutions for the major forest management problems in the Maritimes. There are nine active sub-programs, one dealing primarily with forest research and technical services and one with forestry development agreements. Research projects address several major problem areas including forest renewal, acid rain, forest productivity, spruce budworm, and other insects and diseases. The overall aim of the centre's program is to solve major forestry problems and develop more efficient management techniques for use by forest management agencies in the three maritime provinces.

Facilities: 1) ICP Spectrometer with plasma and therm source 2) Acid rain misting chambers.

#### **Newfoundland Forest Research Centre**

P.O. Box 6028, St. John's, Newfoundland A1C 5X8

Contact: Dr. J.A. Munro, Acting Regional Director, Tel: (709) 772-4683

Personnel: Total is 67.

Activities: The centre conducts most of the forest research in the province. Its work is directed primarily towards satisfying the requirements of the provincial government and the Newfoundland forest industries. Its objective is to provide scientific, technological and economic information and services required for the improvement, protection and efficient utilization of the forest resources.

#### **Northern Forest Research Centre**

5320-122 Street, Edmonton, Alberta T6H 3S5

Contact: Mr. A.D. Kiil, Regional Director of Forestry, Tel: (403) 435-7210

Personnel: Total is 141.

Activities: Research into: 1) Insect and disease management systems and surveys, 2) Environmental impact of toxic substances and vegetation management, 3) Wetlands and climate, 4) Regeneration and plantation management, 5) Nursery management and tree improvement, 6) Stand productivity and forest inventory, 7) Fire management systems, 8) Forest hydrology, 9) Resource economics.

Facilities: Inductively coupled plasma spectrometer.

#### **Pacific Forest Research Centre**

506 West Burnside Road, Victoria, British Columbia V8Z 1M5

Contact: Dr. Macdonald, Regional Director, Tel: (604) 338-3811

Personnel: Total is 183.

Activities: The Centre is engaged in basic and applied research in forestry, technology transfer, negotiation and administration of forestry agreements and job creation. Research activity is conducted in silviculture, tree physiology, soils hydrology, meteorology, forest fire research, entomology, pathology, remote sensing, herbicides and biological control.

Facilities: Electron microscope, image enhancement, VAX 750 computer.

**Petawawa National Forestry Institute**

Chalk River, Ontario K0J 1J0

Contact: Jim McManus, Financial Officer, Tel: (613) 995-7010

Personnel: Total is 99.

Activities: 1) Application of remote sensing in forest land management (forest industry, biophysical surveys, damage detection). Ultra-small-scale aerial and satellite imagery. Computer mapping and data-base systems. Automated image interpretation. Assessment of forest growth, yield, biomass productivity, and environmental impact. 2) Studies on site and growth potential. Impact of intensive forestry on soil processes: development of biological techniques of soil management; soil biology and ecology (N-fixation, mycorrhiza, rhizosphere).

Facilities: Computerized Mass Spectrometer for automated stable isotope Ratio Analysis for C.M.O.S. with accessories.

**Research Station: Agassiz**

P.O. Box 1000, Agassiz, British Columbia V0M 1A0

Contact: Dr. J.E. Miltmore, Director, Tel: (604) 796-2221

Personnel: Total is 58.

Activities: ANIMAL SCIENCE - General nutrition and management of dairy cattle including development of grazing and cropping systems for intensive milk production; copper and selenium requirements of cattle and metabolic interactions with other feed constituents; deposition of yellow fat in pastured steers; nutrition and management of layers, broilers and broiler breeders with a view to minimizing feed costs and maximizing profits and product quality; nutrition and management studies on rabbits. CROP SCIENCE - Weed control, fertility, season extension and storage of vegetables; control of fruit rots and weeds in raspberry and strawberries as well as studies on soil fertility requirements of filberts and raspberries; management and physiology of silage corn; the management of ornamental and recreational turfgrass; and soil and water management of intensively cultivated wetland soils.

**Research Station: Beaverlodge**

P.O. Box 29, Beaverlodge, Alberta T0H 0C0

Contact: Dr. J.D. McElgunn, Director, Tel: (403) 354-2212

Personnel: Total is 55.

Activities: Centre for research on northern agriculture covering response of crops to environment with emphasis on plant survival, micro-meteorology, weed control and plant pathology. Research on cereal and oilseed crops emphasized barley, wheat and rapeseed breeding and agronomy. Forage research concentrates on grass breeding, grass and legume seed management, and the production and utilization of forages. Soils research covers microbiology with emphasis on nitrogen fixation, organic matter relationships and crop management. Research in apiculture includes bee breeding, pathology and management.

**Research Station: Brandon**

P.O. Box 610, Brandon, Manitoba R7A 5Z7

Contact: Dr. B.H. Sonntag, Director, Tel: (204) 728-7324

Personnel: Total is 80.

Activities: ANIMAL SCIENCE: Genetic breeding studies focus on utilization of crossbreeding to improve reproduction, feed lot performance and carcass quality of beef cattle. Reproduction physiology, endocrinology, nutrient requirements, feed utilization, genetics and management are areas of emphasis for improved productivity in swine. PLANT AND SOIL SCIENCE: Emphasis is on development of crop management systems for chernozemic soils of the eastern prairies through integrated fertilizer management, weed science, crop physiology and agronomy research with forages, corn, sorghum, wheat, barley, soybeans, and oilseed crops. In weed research surfactants and additives in herbicide solution are being studied for their effect on plant leaf membranes. In barley breeding the traditional techniques are used in malting and feed variety development. In corn breeding emphasis is placed on the selection of lines for cool season environments.

**Research Station: Charlottetown**

P.O. Box 1210, Charlottetown, Prince Edward Island C1A 7M8

Contact: Dr. L.B. Macleod, Director, Tel: (902) 892-5461

Personnel: Total is 110.

Activities: The Research Station at Charlottetown has the Atlantic Region responsibility for research on the production and utilization of livestock feed crops (forages, cereals, protein), tobacco, and certain vegetable crops grown for processing. Emphasis on potato research is in the area of nutrition and management for processing and table potatoes. Research is conducted on disease evaluation and control and postharvest testing by enzyme-linked immunosorbent assay (ELISA) for virus content of potatoes destined for domestic and export seed markets.

**Research Station: Delhi**

P.O. Box 186, Delhi, Ontario N4B 2W9

Contact: Dr. P.W. Johnson, Director, Tel: (519) 582-1950

Personnel: Total is 51.

Activities: This station is the primary centre for research on flue-cured tobacco in Canada. It is responsible for conducting research on the main problems associated with the production of high quality product to meet the requirements of export markets. Its research program features plant breeding and genetics, soil management and plant nutrition, plant physiology and biochemistry, insect and disease control, harvesting and curing methods, and those factors considered to be associated with tobacco and health. Alternative or rotational crops are being investigated for the sandy soil of the tobacco-growing area.

**Research Station: Fredericton**

P.O. Box 20280, Fredericton, New Brunswick E3B 4Z7

Contact: Dr. Y. Martel, Director, Tel: (506) 452-3260

Personnel: Total is 126.

Activities: The Fredericton Research Station maintains programs on production and improvement of horticultural crops. A multidisciplinary effort is directed to the development of production technologies for potatoes that will ensure the viability of the potato industry, improve the quality of seed potatoes and promote the seed export market. Research on potato breeding includes estimates of genetic parameters, and the use of Canadian germ plasm resources to broaden the genetic base. Integrated pest management is emphasized, as well as testing procedures for mycotoxins. Soil management and conservation studies include ongoing research on erosion control, drainage systems and subsoiling. Animal nutrition, the production of livestock feeds, forage and cereal crops, the handling and conservation of forage are carried out in close collaboration with Nappan Experimental Farm.

**Research Station: Harrow**

Harrow, Ontario N0R 1G0

Contact: Dr. C.F. Marks, Director, Tel: (519) 738-2251

Personnel: Total is 120.

Activities: The research station at Harrow serves southwestern Ontario, where favorable soils and climatic conditions permit an intensive and diversified agriculture. Interdisciplinary research is conducted in eight commodity-oriented programs designed to improve yield, quality, and efficiency of crop production. Crops under study include field and green-house vegetables, stone fruits, pome fruits, corn, soybeans, field beans, winter wheat, and burley tobacco. Crop improvements are achieved by the breeding of new varieties with superior characteristics and the development of improved crop, pest and soil management practices.

**Research Station: Kamloops**

3015 Ord Road, Kamloops, British Columbia V2B 8A9

Contact: Director, Tel: (604) 376-5565

Personnel: Total is 28.

Activities: Specialist station for range management, range plant ecology and integrated resource management research. Also, cultivated forage crops, poisonous plants, winter feeding of cattle and rangeland soil fertility. Research is focussed on servicing the beef industry through development and transfer of technology on forage crops and beef production, as well as studies on bloat, poisonous plants, draught and winterhardiness.

**Research Station: Kentville**

Kentville, Nova Scotia B4N 1J5

Contact: Dr. G.M. Weaver, Director, Tel: (902) 678-2171

Personnel: Total is 118.

Activities: Kentville is the Atlantic regional centre for research on horticultural products including strawberries, blueberries, ornamentals and vegetables. Cereal and forage crop programs emphasize winter cereals. The Station also operates programs on poultry nutrition; on crop protection against pests including studies on plant pathology, insect pests and herbicides; and on fruit and vegetable storage and processing.

**Research Station: Lacombe**

Lacombe, Alberta T0C 1S0

Contact: Dr. D.E. Waldern, Director, Tel: (403) 782-3316

Personnel: Total is 86.

Activities: The animal breeding section conducts research into methods of meat animal breeding, beef, cattle, and swine; major carcass evaluation and carcass grading programs. Studies of beef and pork quality in relation to pre- and post-slaughter conditions are assessed as factors in consumer acceptance.

**Research Station: Lennoxville**

P.O. Box 90, Lennoxville, Québec J1M 1Z3

Contact: Dr. J.C. St. Pierre, Director, Tel: (819) 565-9171

Personnel: Total is 92.

Activities: Research focuses on the production aspects of dairy cattle, beef cattle, swine and sheep, and on the production and utilization of forage crops. Genetic and physiological research is aimed at increasing the reproduction rate of beef cows through crosses with beef and dairy breeds, by reducing calving complications and by stimulating multiple ovulations through better feeding. In swine, work is done on reproductive physiology and in sheep, the researchers seek to lengthen the mating period through selection, in order to obtain two litters per year. Research is also underway on the production of forages, soil fertility and soil physics as well as the agronomic value of animal waste for better disposal by land applications.

**Research Station: Lethbridge**

Lethbridge, Alberta T1J 4B1

Contact: Dr. D.G. Dorrell, Director, Tel: (403) 327-4561

Personnel: Total is 299.

Activities: The Station, located in a well-equipped Agriculture Centre built in 1976, includes space for visiting scientists. The facilities include a small animal vivarium of 29 controlled-environment isolation rooms, a phytotron with over 100 controlled-environment chambers and six greenhouses, and an electron microscopy laboratory. Comprehensive studies in basic and applied research related to agricultural production under rain-fed and irrigated regimes are conducted in multi-disciplinary programs in the following areas: Animal Parasitology, Animal Science, Crop Entomology, Plant Pathology, Plant Science, Soil Science. In addition to the 500-hectares at Lethbridge the Station conducts research at a 20,000-hectare ranch and beef cattle

breeding station near Manyberries, a 500-hectare ranch near Stavely and a 150-hectare irrigation substation at Vauxhall, Alberta.

**Research Station: London**

University Sub Post Office, London, Ontario N6A 5B7

Contact: Dr. H.V. Morley, Director, Tel: (519) 679-4452

Personnel: Total is 84.

Activities: Research is directed towards the improvement of environmental quality and crop protection. Efforts are concentrated on integrated pest management programs (IPM) and environmental toxicology. IPM procedures, including methods of biological control, are being examined for the control of economically important pests. Studies of stored product insects include the development of resistance and the adoption of procedures leading to minimum pest residues. Natural plant disease resistant mechanisms are being studied for use in disease control. Chemical manipulation experiments are in process as well as selective breeding for resistant varieties. Studies are carried out on the efficiency of systematic fungicides and on fungicidal activity and resistance. Other important facets of the research program include the effect of pesticides on non-target organisms and the environmental fate of pesticides.

**Research Station: Melfort**

P.O. Box 1240, Melfort, Saskatchewan S0E 1A4

Contact: Dr. S.E. Beacom, Director, Tel: (306) 752-2776

Personnel: Total is 46.

Activities: The major goals of the Research Station at Melfort are to provide the livestock producer, particularly feedlot operators, with an alternative to expensive feed grains, and to encourage the greater use of perennial forage crops in rotation to prevent further decline in the productive capacity of the soil. Research programs are directed to the improvement of forage systems to make them more economically competitive and to demonstrate that forage production is an integral part of food soil management. The cereal, oilseed and special crops program emphasize improvement of production efficiency with prevention of further soil deterioration.

**Research Station: Morden**

P.O. Box 3001, Morden, Manitoba R0G 1J0

Contact: Dr. A.K. McBeath, Director, Tel: (204) 822-4471

Personnel: Total is 58.

Activities: A main centre of research on field crops such as buckwheat, field corn, field peas; oilseed crops such as flax, sunflower; horticultural crops, vegetables and small fruits; hardy ornamental species of shrubs and trees; and new crops. Programs include the production of new cultivars improved for yield, quality and disease resistance, mechanisms of rust-resistance in flax, methods of propagation of ornamentals, management practices, and weed control in crops.

**Research Station: Ottawa**

Ottawa, Ontario K1A 0C6

Contact: Director, Tel: (613) 995-5287

Personnel: Total is 211.

Activities: The Ottawa Research Station is the major centre for plant breeding in eastern and central Ontario. It is a major centre for ornamentals biotechnology for crop improvement, and integrated management of alfalfa pests. A small unit is engaged with studies of honeybee behavior and pathology. The central office for the Canadian Plant Gene Resources is also part of the Station. The management of the Central Experimental Farm, including numerous services, is also the Station's responsibility. The breeding programs are supported by multidisciplinary research in plant, molecular genetics, cytogenetics, plant physiology and pathology, entomology, cytochemistry, and grain quality. Specific programs emphasize experimental haploidy, tissue-culture genetics, cytology, insect pest management and honeybee pheromones, attractants and diseases.

**Research Station: Regina**

P.O. Box 440, Regina, Saskatchewan S4P 3A2

Contact: Dr. J. Dueck, Director, Tel: (306) 585-0255

Personnel: Total is 50.

Activities: A major centre for the biology and control of weeds in cultivated crops and pastures. High priority is given to the development of technology for biological control, using insects, plant pathogens and cultural means. The bio-control program includes projects on diffuse knapweed, leafy spurge, Canada thistle and sow thistle. The present necessity for weed control by herbicides in crop production requires sophisticated information on efficacy, crop tolerance, environmental persistence and health hazards. Studies of the environmental chemistry of herbicides include estimations of persistence in soils and residues in crops.

**Research Station: Saskatoon**

107 Science Crescent, Saskatoon, Saskatchewan S7N 0X6

Contact: Dr. J.R. Hay, Director, Tel: (306) 343-8214

Personnel: Total is 116.

Activities: There are four research programs with the following objectives: CEREALS; To improve management systems for cereal production in northwestern Saskatchewan, and to develop lines of barley and hard red spring wheat with resistance to common root rot for the prairies, and very high-yielding cultivars of utility wheat. OILSEEDS; To improve management systems for rapeseed/canola production in northwestern Saskatchewan, and mustard for the dark brown soil zones; to develop high-yielding cultivars of rapeseed/canola and mustard with improved chemical properties and good disease resistance, and to develop integrated methods for control of insects in oilseed crops. FORAGE CROPS; To develop hardy, disease resistant, bloat-safe alfalfa cultivars, and improved cultivars of selected grasses for Western Canada, and to develop integrated methods for control of insects in forage crops. INTEGRATED PEST MANAGEMENT; To develop integrated systems including

biological, cultural and chemical means for control of weeds and insects, including grasshoppers, wireworms, and black flies, that will minimize our dependence on chemicals.

**Research Station: Sidney**

8801 East Saanich Road, Sidney, British Columbia V8L 1H3

Contact: Dr. J. Molnar, Director, Tel: (604) 656-1173

Personnel: Total is 28.

Activities: The Station has two responsibilities. First it is a research centre oriented to solving problems and giving direct service to the ornamentals and vegetable industries. Emphasis is placed upon plant nutritional and physiological problems and upon pest control in vegetables and ornamentals. Research on green house energy conservation is also done here. The second responsibility of the Station is for the national post-entry quarantine program for Canada.

**Research Station: St-Jean-sur-Richelieu**

P.O. Box 457, St-Jean-sur-Richelieu, Québec J3B 6Z8

Contact: Dr. C.B. Aubé, Director, Tel: (514) 346-4494

Personnel: Total is 89.

Activities: The research station is situated south of Montreal and offers favourable conditions for the production of horticultural crops, corn and tobacco. Research programs are oriented to the production and protection of vegetables, tree fruits and small fruits as well as herbs and corn, all of which contribute to the economic development of Quebec. The following sub-stations provide the St-Jean Research Station with facilities for field work for fruit, market-garden crops, and legumes, respectively: Frelighsburg, Québec, J0J 1C0; Ste-Clothilde, Québec, J0L 1W0; L'Acadie, 280 Montee Paradis, Québec, J0J 1H0.

**Research Station: St. John's**

P.O. Box 7098, St. John's, Newfoundland A1E 3Y3

Contact: Dr. H. Davidson, Director, Tel: (709) 772-4619

Personnel: Total is 36.

Activities: Multidisciplinary research at St. John's is directed towards the control of potato wart and golden nematode diseases, clubroot disease of turnip, and economic crop insects, as well as plant nutrition and vegetable adaptation trials. Emphasis is placed on increasing vegetable and forage production on peat soils.

**Research Station: Ste-Foy**

2560 Hochelaga Boulevard, Ste-Foy, Québec G1V 2J6

Contact: S.J. Bourget, Director, Tel: (418) 694-4814

Personnel: Total is 89.

Activities: This Research Station, located near the campus of Laval University, is responsible for research aimed at overcoming problems associated with the production of forage and cereal crops in Québec and other parts of Eastern Canada. Attention is given to grasses and legumes, especially timothy and alfalfa; to cereals, notably oats and barley; to soil management, particularly the fertility and drainage requirements of low lying alluvial soils; and to insect, disease and physiological problems associated with crop production, with special emphasis on research on factors contributing to winter hardiness.

**Research Station: Summerland**

Summerland, British Columbia V0H 1Z0

Contact: Dr. G.C. Russell, Director, Tel: (604) 494-7711

Personnel: Total is 96.

Activities: Basic and applied research is conducted to solve problems concerned with the tree fruit and grape industries. The principal areas of research involving various scientific disciplines include: Entomology - Plant Pathology, Food Technology, Pomology and viticulture, and Soil Science and Agriculture Engineering.

**Research Station: Swift Current**

P.O. Box 1030, Swift Current, Saskatchewan S9H 3X2

Contact: Dr. D. Bowden, Director, Tel: (306) 773-4621

Personnel: Total is 119.

Activities: Research takes a multidisciplinary approach to the production of high yields and disease resistance in cereal and forage crops. This is accomplished through research in plant breeding, plant physiology, agronomy, soil and water management, salinity control, nutrition, agrometeorology, and agricultural engineering. The station is a centre of expertise for energy production in the Prairie Region, and investigates methods of dual-fuelling, the use of wind energy, and geothermal energy for heating purposes. Assistance in the problem solving is provided at national and international levels.

**Research Station: Vancouver**

6660 N.W. Marine Drive, Vancouver, British Columbia V6T 1X2

Contact: Dr. D.M. Weintraub, Director, Tel: (604) 224-4355

Personnel: Total is 55.

Activities: The principal centre for plant virus research. Areas of special interest include: physical and chemical characteristics of plant virus particles, amino acid and nucleotide studies; response of plants to virus infection and the mode of action of viruses; plant virus inhibitors and virus multiplication; mixed infections and the resolution of complexes and separation of strains; host ranges and the characterization of plant virus diseases; serology, precipitin, complement fixation, ELISA; the use of biotechnology (monoclonal antibody production, complementary DNA) for plant virus diagnosis; meristem culture and virus-free clones; the morphology and fine structure of vectors; aphids and nematodes as vectors; the physiology of potato diseases. In addition, research is carried out on bacterial and fungal diseases, and integrated pest management in small fruit and vegetable crops, as well as an extensive program in small fruit breeding.

**Research Station: Vineland**

Vineland, Ontario L0R 2E0

Contact: Dr. R.S. Menzies, Director, Tel: (416) 562-4113

Personnel: Total is 61.

Activities: The multidisciplinary, mission-oriented research program at Vineland includes the application of entomology, acarology, virology, mycology, nematology, residue chemistry and engineering to a variety of crops ranging from tree fruits, grapes, small fruits and vegetables to ornamentals, forage crops and tobacco. Pest management systems are being developed that employ a minimum of pesticide, yet permit effective pest control in fruit and vegetable crops. Methods of control for viral, fungal, and bacterial diseases through chemical and cultural means are being investigated.

**Research Station: Winnipeg**

195 Dafoe Road, Winnipeg, Manitoba R3T 2M9

Contact: Dr. T.G. Atkinson, Director, Tel: (204) 269-2100

Personnel: Total is 115.

Activities: The station is situated on the University of Manitoba Campus and maintains laboratory and greenhouse facilities. Research programs at Winnipeg can be broadly classified under three headings: development of improved cereal cultivars, protection of stored seed and seed products and integrated pest management of insect pests of fieldcrops. Research on the development of progressively superior cultivars of bread and durum wheat; development of barley and oats crops with improved agronomic and disease resistant characteristics. Quality testing and some disease screening services are provided to breeders at other establishments. Research on the storage and protection of grains, oilseeds and their products emphasizes ecology of storage; insecticide control and the detection, prevention and dynamics of mycotoxins in stored grains and oilseeds. Integrated control of agricultural pests is approached through damage assessment methodology, and increased knowledge of biology, parasitology, pathology and physiology of insect pests of cereal and oilseed crops.

**Senator Herve J. Michaud Experimental Farm**

P.O. Box 667, Buctouche, New Brunswick E0A 1G0

Contact: M. Romain Rioux, Superintendent, Tel: (506) 743-2464

Personnel: Total is 11.

Activities: Work at this farm is concerned with response to the industry requirements of the Eastern New Brunswick coastal area, and with techniques for improving winter hardiness of apple trees and management of small fruit crops.

**Smithfield Experimental Farm**

P.O. Box 340, Trenton, Ontario K8V 5A5

Contact: Dr. R.S. Miller, Superintendent, Tel: (613) 392-3527

Personnel: Total is 24.

Activities: Smithfield Experimental Farm is administratively linked to the Vineland Research Station and carries on horticultural production and processing research, as well as pest control research programs in cooperation with Vineland.

**Western Laboratory - Services Division**

102-11th Avenue, S.E., Calgary, Alberta T2G 0X5

Contact: Mr. James A. Scott, Laboratory Director, Tel: (403) 231-5741

Personnel: Total is 29.

Activities: This laboratory provides physical, chemical and biological testing services in support of inspections, quality and safety assurance programs of the Food Protection and Inspection Branch, on food products (meat, egg, dairy, fruit and vegetable products) and agricultural inputs (feeds, fertilizers, seeds and pesticides) for the western regions. Analytical methodology research is conducted in order to maintain state-of-the-art quality service on a timely and reliable basis.

**ATOMIC ENERGY CONTROL BOARD**

270 Albert Street, Ottawa, Ontario K1P 5S9

Contact: Mrs. K. Bryant, Financial Planning and Systems Officer, Tel: (613) 995-0430

Personnel: Total is 249.

Activities: Administration of Atomic Energy Control Regulations - The making of regulations for developing, controlling, supervising, and licensing the production, application and use of atomic energy; the regulating of mining, refining production, processing, import, export, transport, possession, ownership, use or sale of prescribed substances; the defining of standards to be met, the assessing of the capabilities of licence applicants to meet these standards and to assure their maintenance, and the inspecting to ensure compliance; the conducting of mission-oriented research and development to obtain data essential for the effective implementation of licensing and compliance activities; and the designating, under the Nuclear Liability Act, of nuclear installations and the prescribing of the basic insurance to be carried by the operators of such installations.

**ATOMIC ENERGY OF CANADA LIMITED****Chalk River Nuclear Laboratory**

Chalk River, Ontario K0J 1J0

Contact: A.D.B. Woods, Tel: (613) 236-6444

Personnel: Total is 2386.

Activities: Programs cover a wide range of topics associated with atomic power. Work on basic physics, chemistry, materials science, and biology provides fundamental support to all aspects of nuclear technology and serves a national laboratory role in the nuclear sciences. CRNL supports the near-term needs of CANDU reactors by research programs on component development, systems chemistry, fuel behavior, heat transfer, reactor control and instrumentation, and fuel channel behavior. There is also development work to demonstrate that low and intermediate-level radioactive wastes arising from reactor operation can be immobilized in a stable form before disposal in a repository. Long-term needs of nuclear power are addressed by development of advanced nuclear fuel cycles and the development of accelerator technology.

#### **Whiteshell Nuclear Research Establishment**

Pinawa, Manitoba R0E 1L0

Contact: A.D.B. Woods, Tel: (613) 236-6444

Personnel: Total is 1177.

Activities: Programs are mainly focussed on nuclear fuel waste management and on nuclear reactor safety research. WNRE directs the research on disposal of used fuel and fuel recycle wastes. This includes research on fuel waste immobilization, geotechnical research to develop methods of characterizing the rock formations that might host the disposal vault, the environmental and safety assessment to predict radionuclide migration from such disposal. The nuclear reactor safety program is intended to improve our understanding of nuclear reactor behavior under postulated loss-of-coolant accident conditions. This includes research work on the thermalhydraulics of the reactor heat transport system, on the thermal-mechanical behavior of fuel and fuel channels, and on the containment atmosphere. Other work at WNRE includes fundamental investigations of the biological effect of radiation, and basic research in chemistry and materials science.

### **CONSUMER AND CORPORATE AFFAIRS CANADA**

#### **Patent Office**

Place du Portage, Phase 1 - 50 Victoria Street, Hull, Québec K1A 0C9

Contact: Mart Leesti, Deputy Director General, Tel: (613) 997-1057

Personnel: Total is 269.

Activities: The responsibility of the Patent Office is the granting of patents, the acquisition and dissemination of technological information and the encouragement of the creation, adoption and exploitation of inventions.

### **DEPARTMENT OF COMMUNICATIONS**

#### **Communications Research Centre**

P.O. Box 11490, Station H, Ottawa, Ontario K2H 8S5

Contact: Daryl Leitch, Financial Analyst, Tel: (613) 990-4665

Personnel: Total is 275.

Activities: To advance Canada's research and development in the areas of telecommunications, space and information science and technology.

### **ENERGY, MINES AND RESOURCES CANADA**

#### **Atlantic Geoscience Centre**

P.O. Box 1006, Dartmouth, Nova Scotia B2Y 4A2

Contact: M.P. Petre, Program Officer, Tel: (613) 995-4214

Personnel: Total is 102.

Activities: The Atlantic Geoscience Centre is located at Bedford Institute of Oceanography. Research is concerned with geological and geophysical studies of the continental margins of eastern and Arctic Canada and contiguous ocean basins; Geology of the sedimentary basins along the eastern Canadian seaboard including Bay of Fundy, Gulf of St. Lawrence, Hudson Bay, Baffin Bay and the entire adjacent Atlantic shelf; Marine geological and geophysical mapping; Experimental and theoretical studies on the development of continental margins; Petroleum geology; Coal petrology, Surficial and environmental marine geology including Quaternary stratigraphy and glacial history, seabed stability and marine geotechnics, sedimentology of coastal and marine sedimentary environments, inorganic and organic geochemistry. Technology development, e.g., ocean bottom seismometers. Developments in management of geological, paleontological and geophysical data. Topics of particular current interest include geophysical modelling of the development of sedimentary basins; studies of seabed stability on the continental shelf and slope; seismicity of passive margins.

Facilities: Marine Geophysical, Geological Survey and Data Processing Equipment including mini-computers, microprocessors and access to BIO mainframe; equipment for geochemistry and paleontology labs, instrument and electronic shops.

**Calgary Coal Research Laboratory**

#380, 4500-16 Ave. N.W., Calgary, Alberta T3B 0M6

Contact: George Zahary, Lab Manager, Tel: (403) 286-5512

Personnel: Total is 14.

Activities: The Calgary Coal Research Laboratory performs research in coal mining in the areas of underground ventilation and control of ground movement in Western Canadian mines. The laboratory is the focus of CANMET's national responsibility for coal reserve assessment as well as the centre for liaison with the Western coal mining industry. The general objective of the coal mining R&D effort is the achievement of improved health and safety in underground mining. Investigations are currently underway to correlate the adventitious production of explosive gases with the schedules of underground production in an hydraulic mine. This investigation is an expansion of previous work which led to the successful development of aerial surveying methods capable of identifying surface movements which responded to the underground production schedules at the same mine. The laboratory has also directed feasibility studies into the technical problems associated with the introduction of longwall mining into Western Canada which is, at present, restricted to the Maritime coal mines.

**Canada Centre for Remote Sensing**

2464 Sheffield Road, Ottawa, Ontario K1V 0X7

Contact: A.E. Godby, Director General, Tel: (613) 993-0121

Personnel: Total is 122.

Activities: Improve remote sensing technology and facilitate the acquisition and dissemination of remote sensed data from aircraft and satellites.

Facilities: Satellite receiving ground stations, image analysis systems, special purpose production systems with specially designed hardware interfaces.

**Canadian Explosive Atmospheres Laboratory**

c/o 555 Booth Street, Ottawa, Ontario K1A 0G1

Contact: Mr. J.A. Bossert, Manager and Certification Officer, Tel: (613) 996-4570

Personnel: Total is 13.

Activities: Research into explosion and fire safety in atmospheres containing explosive gases, vapours and dusts such as underground coal mines. Certification and testing services for electrical and diesel explosion proof equipment, and fire-resistant materials used in underground mines and similar applications.

Facilities: Test Facilities for: Atmospheric explosion tests, engine load tests (400HP), exhaust emissions analysis, intrinsic safety tests, gas detection tests, fire-resistant tests for conveyor belts, electric cables, pipes and dusts and hydraulic fluids.

**Canadian Explosives Research Laboratory**

c/o 555 Booth Street, Ottawa, Ontario K1A 0G1

Contact: Mr. R.R. Vandebek, Manager, Tel: (613) 995-1275

Personnel: Total is 16.

Activities: Certifies explosives submitted for authorization under the Canadian Explosives Act, investigates accidents involving explosives, provides technical advice on and advances technology related to the manufacture, storage, transportation and use of explosives, and advances technology for reducing explosion hazards in coal mines and other hazardous areas.

Facilities: Includes large scale tanks to determine properties of explosives, friction and impact tests, dust explosibility equipment, accelerating rate calorimeter for thermal stability studies of energetic methods.

**Cape Breton Coal Research Laboratory**

201 George Street, Sydney, Nova Scotia B1P 1J3

Contact: Bruce Stewart, Lab Manager, Tel: (902) 539-5344

Personnel: Total is 19.

Activities: The Cape Breton Coal Research Laboratory was established as part of CANMET's continuing program in response to a recommendation of the Elfstrom Commission's report on the multiple fatalities in No. 26 Colliery at Glace Bay, N.S. The objectives of the R & D program are the establishment of safe, efficient mining techniques for local use, to develop a program for effective underground explosion control and to assist in the development and implementation of new techniques underground. The laboratory is moving towards its full complement. The initial phases of two underground experimental programs in underground strata control and ventilation system analysis are underway and have been coordinated with Cape Breton Development Corporation. Plans for the use of a prototype Canadian tunnel boring machine currently under construction in Toronto include performance evaluations by staff of the laboratory. All three laboratories (Cape Breton, Edmonton and Calgary) have a common emphasis on field oriented R & D programs that are frequently carried out in conjunction with industry at the industrial partner's operating mine or coal preparation plant. Support from the divisional laboratory bench activities and, on occasion, from other divisions of CANMET contribute to the success of the field activities.

**Combustion and Carbonization Research Laboratories**

Nepean, Ontario K2X 1X1

Contact: Mr. G. Lee, Lab Manager, Tel: (613) 996-4570

Personnel: Total is 52.

Activities: The work of this laboratory includes initiatives in combustion from domestic furnaces and wood stoves to the burning of low grade and hybrid fuels using conventional and fluidized bed technologies, as well as research on the treatment and carbonization of coal for coke-making. Work is also done on the preparation of coal feedstock for synfuels and combustion research. This laboratory provides technical support for demonstration by other departments including support for the Coal Branch demonstrations in coal-water mixtures, fluidized bed, etc.

Facilities: Distillation unit, gasifiers, spectroscopy, analyzers, calorimeters, fluidized bed pilot plant, boilers, furnaces, coke ovens.



#### **Earth Physics Branch - Headquarters**

1 Observatory Crescent, Ottawa, Ontario K2K 1Y8

Contact: Dr. P.A. Camfield, Program Officer, Tel: (613) 996-4463

Personnel: Total is 135.

Activities: The Earth Physics Branch collects, interprets and distributes geophysical information on the structure, processes and hazards of the solid earth. Crucial to the successful accomplishment of this task is the continual development of expertise in the fields of seismology, gravity, geomagnetism, geodynamics, geothermics and geothermal energy as well as ancillary disciplines.

#### **Edmonton Coal Research Laboratory**

P.O. Box 3294, Sherwood Park, Alberta T6A 2A6

Contact: Dr. Hassan A. Hamza, Lab Manager, Tel: (403) 464-9312

Personnel: Total is 30.

Activities: The Edmonton Coal Research Laboratory performs research in coal-cleaning and coal-washery waste clean-up, metallurgical coal processing for the production of blast-furnace coke, and the separation of bitumen-water emulsions produced during heavy-oil extraction processes. The objective of the coal cleaning and waste clean-up programs is to provide the coal industry with effective and economic technology for the removal of sulphur and ash so as to upgrade product quality to maintain and increase the Canadian share of the Pacific Rim market. The basic development of concepts is carried out in bench-scale experiments and developed into engineering design data using the 10 t/hr pilot scale coal cleaning plant. This pilot plant is unique in Canada and rare in the world and is frequently used in joint industry/government research programs. New facilities include a mobile pilot plant for the performance of on-site field experiments at both heavy-oil recovery and coal cleaning plant locations.

#### **Elliot Lake Laboratory**

P.O. Box 100, Elliot Lake, Ontario P5A 2J8

Contact: R. Tervo, Manager, Elliot Lake Laboratory, Tel: (705) 848-2236

Personnel: Total is 25.

Activities: Rock Mechanics and Ground Control in Mines, Underground Environment - Radiation, Dust, Ventilation and Noise; Mine Tailings Management.

Facilities: Four million pound capacity rock testing machine, Radiation calibration laboratory.

#### **Geological Survey of Canada - Cordilleran Geology Division**

100 West Pender Street, 6th Floor, Vancouver, British Columbia V6B 1R8

Contact: Ms. M.A. Petre, Program Officer, Tel: (613) 995-4214

Personnel: Total is 46.

Activities: CORDILLERAN GEOLOGY DIVISION: Geological problems of the Canadian Cordillera: structure, stratigraphy, sedimentology, paleontology, petrology, geochronology, regional syntheses, volcanology, geothermal studies and others. Metallogeny of the Canadian Cordillera. MARINE GEOLOGY SECTION OF CGD: Marine geology section is located at the Pacific Geoscience Centre. Geological studies of the Canadian Pacific continental margin: marine bedrock geology and geophysics including relevant onshore studies; stratigraphy, sedimentology, paleontology, structure, petrology, seismic, magnetism, regional syntheses, coastal geology, geology of estuaries, offshore surficial deposits, relevant geophysics.

Facilities: Marine geophysical and geological survey equipment, data processing equipment, equipment for paleontology labs.

#### **Geological Survey of Canada - Ottawa Division**

601 Booth Street, Ottawa, Ontario K1A 0E8

Contact: Ms. M.A. Petre, Program Officer, Tel: (613) 995-4214

Personnel: Total is 467.

Activities: The Geological Survey of Canada is responsible for the conduct of geological, geophysical and geochemical research and surveys; estimation of mineral and non-renewable energy resources; investigation of geological phenomena affecting engineering works and the environment; development of geophysical and other technologies; development of national geoscience standards; fostering Canadian geoscience and international geoscience activities; cooperation with the provinces; provision of advice to government; and production and dissemination of maps and reports.

Facilities: Equipment for geochemistry, geochronology, sedimentology, analytical chemistry and mineralogy labs, machine shop, electronic shop; cartographic and photographic equipment, data processing equipment. Examples of individual items over \$100K are: electron microprobes and minicomputer (for microprobe), scanning electron microscope, spectrometer, X-ray fluorescent spectrometer, mass spectrometers, Lanston monotype camera, plotting tables, 2 twin engine aircraft (Queenair and Skyvan), motor launch, precious metals.

#### **Hydrocarbon Processing Research Laboratory**

Nepean, Ontario K2X 1X1

Contact: Martin Terman, Lab Manager, Tel: (613) 995-4473

Personnel: Total is 37.

Activities: The work of this laboratory is focussed on the production and refining of hydrocarbon liquid fuels. The laboratory includes the foremost coal analysis group in Canada which provides data for a variety of research projects. Expertise is maintained for proximate and ultimate analysis of coal and for analysis of major and minor trace elements in coal derived ash as well as related materials.

Facilities: Distillation Unit, Gasifiers, Spectroscopy, Analyzers, Calorimeters, Fluidized Bed Pilot Plant, Boilers, Furnaces, Coke Ovens.

**Institute for Sedimentary and Petroleum Geology**

3303-33rd Street N.W., Calgary, Alberta T2L 2A7

Contact: Ms. M.A. Petre, Program Officer, Tel: (613) 995-4214

Personnel: Total is 153.

Activities: Geology of sedimentary basins of western and arctic Canada; structural geology and model studies, tectonics, geomathematical resource studies. Invertebrate paleontology, palynology, paleobotany, stratigraphy and sedimentology. Clay mineralogy, coal geology, petroleum geology and organic geochemistry. Assessment of petroleum and coal resources, geochemical instrumentation; computer-based analyses of geochemical and hydrocarbon coal data.

Facilities: Computer capability for data storage and evaluation of petroleum, natural gas and coal resources; equipment for geochemistry, clay mineralogy, carbonates, paleontology, palynology labs, electronics shop, and machine shop; data processing equipment, cartographic and photographic equipment.

**Mineral Sciences Laboratories**

550 Booth Street, Ottawa, Ontario K1A 0G2

Contact: W.A. Gow, Director, Tel: (613) 995-4088

Personnel: Total is 194.

Activities: The main thrust of the Mineral Science Laboratories' work is in mineral processing. The Laboratories main task is to research, develop and promote technology to increase the recovery of marketable minerals from Canadian ores and to upgrade minerals to higher value. This is accomplished by generating new and improved processing techniques and equipment with minimal adverse economic and environmental consequences. All aspects of processing come under examination, including the characteristics of mineral content in the ore, the preparation of standard reference ores, the concentration of minerals by flotation and gravity separation and the extraction of economic metals from concentrates.

Facilities: Spectrometers, Microbalances, Sluices, Magnetic Separator Sizers, Testing Machines, Freeze/Thaw Machines, Ovens, Grinders, Classifiers, Separators, Polishers, Cameras, Microscopes, Analyzers, Conductivity Apparatus, Diffusivity Apparatus, Calorimeters, Mixers.

**Pacific Geoscience Centre**

P.O. Box 6000, Sidney, British Columbia V8L 4B2

Contact: Dr. P.A. Camfield, Program Officer, Tel: (613) 996-4463

Personnel: Total is 26.

Activities: Geological studies of the Canadian Pacific continental margin: marine bedrock geology and geophysics including relevant onshore studies; stratigraphy, sedimentology, paleontology, structure, petrology, seismic, magnetics, regional syntheses, coastal geology, geology of estuaries, offshore surficial deposits, relevant geophysics. Electromagnetic induction in the crust. Engineering seismology studies. Tectonophysics. Strong motion theoretical studies. Application of gravity to geological problems, crustal and upper mantle structure and isostasy. Geothermal studies. Marine geophysics, including studies of polymetallic sulphides on the Juan de Fuca Ridge.

**Physical Metallurgy Resource Laboratory (CANMET)**

568 Booth Street, Ottawa, Ontario K1A 0G1

Contact: Gilles Rochon, Office Manager, Tel: (613) 993-4930

Personnel: Total is 145.

Activities: The research conducted at the PMRL has two aims. The first is to provide technical support to government policy making and the second is to liaise with Canadian industry to develop new technology. PMRL is divided into two laboratories. Metals Development Laboratory conducts fundamental and practical research into the properties and structure of metals and alloys. The Metals Processing Laboratory conducts research on the making, shaping, joining and nondestructive evaluation of metals and alloys.

**Polar Continental Shelf Project**

880 Wellington Street, Ottawa, Ontario K1A 0E4

Contact: G.D. Hobson, Director, Tel: (613) 996-3388

Personnel: Total is 30.

Activities: Through arctic science and logistic support contributes to the orderly scientific investigation of Canada's polar continental shelf, the contiguous Arctic ocean and mainland regions.

**Rock Mechanics Laboratory**

c/o 555 Booth Street, Ottawa, Ontario K1A 0G1

Contact: Mr. Glen E. Larocque, Manager, Rock Mechanics Laboratory, Tel: (613) 996-4570

Personnel: Total is 23.

Activities: The laboratory carries out mining technology research and technical investigations in the following areas: mining methods and equipment, mine evaluation, coal and uranium reserve assessment, mine cost models, rock mechanics and numerical models, rock structural properties and rock mechanics case studies.

Facilities: Computers/computer graphics/rock test equipment and facilities.

**Surveys and Mapping Branch**

615 Booth Street, Ottawa, Ontario K1A 0E9

Contact: Art Jansen, Branch Comptroller, Tel: (613) 995-4871

Personnel: Total is 467.

Activities: The Surveys and Mapping Branch is the federal government agency responsible for providing basic surveys and maps of Canada. The Branch's activities are of fundamental importance to the orderly and successful exploration and development of Canada's resources.

Facilities: Cartographic Data processing System, Doppler Satellite Receivers, Inertial Survey Systems, Deep Bench Mark Drill Rigs, Motorized Levelling Unit, Surveying Instruments.

#### **Synthetic Fuels Research Laboratories**

Nepean, Ontario K2X 1X1

Contact: Jean Denis, Lab Manager, SFRL, Tel: (613) 996-4570

Personnel: Total is 52.

Activities: There are two main sub-program activities in this laboratory, Petroleum Supply and Coal. Petroleum supply initiatives are mostly in the area of heavy oil and bitumen and coal initiatives are in co-processing and liquefaction. The objective is to enhance the utilization of these resources.

Facilities: Distillation Unit, Gazifiers, Spectroscopy, Analyzers, Calorimeters, Fluidized Bed Pilot Plant, Boilers, Furnaces, Coke Ovens.

### **ENVIRONMENT CANADA**

#### **Atmospheric Environmental Service: Central Region**

266 Graham Avenue, Winnipeg, Manitoba R3C 3V4

Contact: M.J. Balshaw, Regional director, Tel: (204) 949-4380

Personnel: Total is 252.

Activities: Provision of meteorological services to the provinces of Manitoba and Saskatchewan and the central portion of the Northwest Territories.

Facilities: Weather radar, upper atmospheric measurement equipment, automatic weather stations, other meteorological equipment, EDP equipment.

#### **Atmospheric Environmental Service: Atlantic Region**

1496 Bedford Highway, 6th Floor, Bedford, Nova Scotia B4A 1E5

Contact: A.D.J. O'Neill, Regional Director, Tel: (902) 835-9328

Personnel: Total is 230.

Activities: Provision of meteorological services to the provinces of New Brunswick, Nova Scotia, Newfoundland and Prince Edward Island.

Facilities: Weather radar, satellite receiving equipment, upper atmospheric measurement equipment, automatic weather stations, other meteorological equipment, EDP equipment.

#### **Atmospheric Environmental Service: Western Region**

6325-103 Street, Argyle Centre, Edmonton, Alberta T6H 5H6

Contact: B.M. Burns, Regional Director, Tel: (403) 437-1250

Personnel: Total is 258.

Activities: Provision of meteorological services to the province of Alberta, the Yukon and the Western part of the Northwest Territories.

Facilities: Weather radar, satellite receiving equipment, upper atmospheric measurement equipment, automatic weather stations, other meteorological equipment, EDP equipment.

#### **Atmospheric Environmental Service: Pacific Region**

900-1200 West 73rd Avenue, Bordigan Building, Vancouver, British Columbia V6P 6G5

Contact: K. Dawson, Regional Director, Tel: (604) 732-4673

Personnel: Total is 193.

Activities: Provision of meteorological services to the province of British Columbia.

Facilities: Satellite receiving equipment, upper atmospheric measurement equipment, automatic weather stations, other meteorological equipment, EDP equipment.

#### **Atmospheric Environmental Service: Québec Region**

100 Alexis Nihon Boulevard, 31st Floor, St. Laurent, Québec H4M 2N6

Contact: R.J. Fichaud, Regional Director, Tel: (514) 333-3000

Personnel: Total is 211.

Activities: Provision of meteorological services to the province of Quebec and the Eastern part of the Northwest Territories.

Facilities: Weather radar, upper atmospheric measurement equip, automatic weather stations, other meteorological equip, EDP equipment.

#### **Atmospheric Environmental Service: Ontario Region**

25 St. Clair Avenue East, 3rd Floor, Toronto, Ontario M4T 1M2

Contact: G.A. McPherson, Regional Director, Tel: (416) 966-5624

Personnel: Total is 200.

Activities: Provision of meteorological services to the province of Ontario.

Facilities: Weather radar, upper atmospheric measurement equip, automatic weather stations, other meteorological equip, EDP equipment.

**Atmospheric Environmental Service: Headquarters**

4905 Dufferin Street, Downsview, Ontario M3H 5T4

Contact: C.B. Adamson/J.P. Boll, Director Program Evaluation/ Director Finance and Administration, Tel: (416) 667-4562

Personnel: Total is 945.

Activities: Air quality and inter-environmental research, climatological services, ice services, meteorological standards, EDP services, meteorological stores, financial services, personnel services.

Facilities: Satellite receiving equipment, EDP equipment, Lab equipment, radars, airborne ice reconnaissance equipment (SLAR)

**Canadian Wildlife Service - Ontario Region**

1725 Woodward Drive, Ottawa, Ontario K1A 0E7

Contact: D.J. Hughes, Chief, Administrative Services, Tel: (613) 998-4693

Personnel: Data not available.

Activities: To conserve and promote the conservation and enjoyment of Canadian wildlife and migratory birds. To provide opportunities for the development of awareness enjoyment, understanding and appreciation of Canadian wildlife heritage and its environment.

**Canadian Wildlife Service - Pacific Region**

P.O. Box 340, Delta, British Columbia V4K 3Y3

Contact: Phil Whitehead, Acting Chief, Tel: (604) 666-0143

Personnel: Data not available.

Activities: Wildlife research and conservation.

**Canadian Wildlife Service - Western and Northern Region**

9942 - 108 Street, Edmonton, Alberta T5K 2J5

Contact: P. Parania, Chief Administration, Tel: (403) 420-2527

Personnel: Data not available.

Activities: Migratory birds conservation; wildlife research and conservation; interpretation; wildlife management and administration.

**Environmental Protection Service: Dartmouth**

45 Alderney Drive, Dartmouth, Nova Scotia B2Y 2N6

Contact: R. Matteau, Chief - Financial Services, Tel: (613) 997-3733

Personnel: Total is 61.

Activities: The objectives of EPS is to ensure that human activities are conducted in a way that will achieve and maintain a state of the environment necessary for the health and well being of man, the health and diversity of species and of ecosystems and the sustained use of natural resources for social and economic benefit.

**Environmental Protection Service: Toronto**

25 St Clair Avenue, Toronto, Ontario M4T 1M2

Contact: R. Matteau, Chief - Financial Services, Tel: (613) 997-3733

Personnel: Total is 33.

Activities: The objectives of EPS is to ensure that human activities are conducted in a way that will achieve and maintain a state of the environment necessary for the health and well being of man, the health and diversity of species and of ecosystems and the sustained use of natural resources for social and economic benefit.

**Environmental Protection Service: Edmonton**

9942-108 Street, Edmonton, Alberta T5K 2J5

Contact: R. Matteau, Chief - Financial Services, Tel: (613) 997-3733

Personnel: Total is 46.

Activities: The objectives of EPS is to ensure that human activities are conducted in a way that will achieve and maintain a state of the environment necessary for the health and well being of man, the health and diversity of species and of ecosystems and the sustained use of natural resources for social and economic benefit.

**Environmental Protection Service: Hull**

Place Vincent Massey, Hull, Québec K1A 0E7

Contact: R. Matteau, Chief - Financial Services, Tel: (613) 997-3733

Personnel: Total is 167.

Activities: The objectives of EPS is to ensure that human activities are conducted in a way that will achieve and maintain a state of the environment necessary for the health and well being of man, the health and diversity of species and of ecosystems and the sustained use of natural resources for social and economic benefit.

**Environmental Protection Service: Vancouver**

Kapilano 100, Park Royal, Vancouver, British Columbia V7T 1A2

Contact: R. Matteau, Chief - Financial Services, Tel: (613) 997-3733

Personnel: Total is 62.

Activities: The objectives of EPS is to ensure that human activities are conducted in a way that will achieve and maintain a state of the environment necessary for the health and well being of man, the health and diversity of species and of ecosystems and the sustained use of natural resources for social and economic benefit.

**Environmental Protection Service: Montréal**

1550 Maisonneuve Boulevard, Montréal, Québec H3G 1N2

Contact: R. Matteau, Chief - Financial Services, Tel: (613) 997-3733

Personnel: Total is 36.

Activities: The objectives of EPS is to ensure that human activities are conducted in a way that will achieve and maintain a state of the environment necessary for the health and well being of man, the health and diversity of species and of ecosystems and the sustained use of natural resources for social and economic benefit.

**Inland Waters Directorate - Ontario Region**

867 Lakeshore Road, Burlington, Ontario L7R 4A6

Contact: E.T. Wagner, Director, Tel: (416) 637-4531

Personnel: Data not available.

Activities: Water management, water data gathering, water investigations, socio-economic studies.

Facilities: Water sampling and measuring equipment; remote data transmission devices.

**Inland Waters Directorate - Pacific and Yukon Region**

502 - 1001 West Pender Street, Vancouver, British Columbia V6E 2M9

Contact: E.M. Clark, Director, Tel: (604) 666-6252

Personnel: Data not available.

Activities: To promote sound management and development of Canada's water resources in keeping with federal responsibilities and national objectives, including Canada-U.S. and Interjurisdictional Water Management, Flood Damage Reduction, Water Quality Management Data, Water Quantity Management Data, Water Management Research, Toxic Chemicals and Environmental Assessment and Baseline Studies.

**Inland Waters Directorate - Western and Northern Region**

1901 Victoria Avenue, Regina, Saskatchewan S4P 3R4

Contact: R.A. Holiday, Assistant Director, Tel: (306) 359-5315

Personnel: Data not available.

Activities: Providing information, advice and recommendations related to water resource planning and management.

**Lands Directorate**

20th Floor, Place Vincent Massey, Hull, Québec K1A 0E7

Contact: P. Lefebvre, Director, Financial and Administration Services, Tel: (819) 997-2010

Personnel: Data not available.

Activities: The aim of the Lands Directorate is to promote environmentally sound uses and management of Canada's land resources in keeping with federal responsibilities and national objectives. The Directorate's program has two major components: (1) Land Use Policy and Research, (2) Land Monitoring, Evaluation and Data Systems. The first component embraces land use policy development, socio-economic research on land use and methodological development for land use planning. The second covers the development of data bases on the characteristics and use of land, ecological research and land capability assessment, and data management and processing services. Associated with each component are related coordination, advisory and information services. It can be said that the Directorate is applying an interdisciplinary approach to develop an understanding and an appreciation of the country's land resources and their uses from a national perspective. And it is taking measures — frequently through cooperative action and other agencies — to promote full consideration of national land resource interests in the many planning and decision-making forums that influence the evolution of the land use pattern and the quality, productivity and management of the land.

Facilities: Main frame, mini and micro computer.

**Migratory Birds Branch - Biometrics Section**

Canadian Wildlife Service, Ottawa, Ontario K1A 0E7

Contact: S. Wendt, Head, Tel: (819) 997-1121

Personnel: Data not available.

Activities: Monitor distribution and abundance of waterfowl. To develop or improve surveys to determine production and populations of waterfowl species. To improve estimates and understanding of factors affecting mortality, and the relationship between hunting and non-hunting mortality.

**Migratory Birds Branch - Migratory Birds Conservation**

Canadian Wildlife Service, Ottawa, Ontario K1A 0E7

Contact: J. Patterson, Director, Tel: (819) 997-2957

Personnel: Data not available.

Activities: Research studies with focus on the interaction of migratory birds with their natural environment and with man's activities. Specific areas of study; - Population and community ecology of seabirds and shorebirds; impact of commercial fisheries on seabird populations. Impact of forest management practices on woodland species; establishing techniques to inventory and monitor various species; the effect of hunting regulations on waterfowl populations; effect of agriculture practices on prairies and parkland migratory bird communities; the social and economic importance of wildlife to Canadians.

**Migratory Birds Branch - Waterfowl Research**

Canadian Wildlife Service, Ottawa, Ontario K1A 0E7

Contact: J. Patterson, Director, Migratory Birds Branch, Tel: (819) 997-2957

Personnel: Data not available.

Activities: Assessing the use of migratory birds by native people and the interaction of migratory birds with the natural environment and with man's activities.

**National Hydrology Research Institute**

351 St. Joseph Blvd., Hull, Québec K1A 0E7

Contact: D.H. Lennox, Director, Tel: (819) 994-4010

Personnel: Data not available.

Activities: Research into problems and phenomena of surface water, ground water and snow and ice. Ground Water Division studies the effects of (1) surface and subsurface disposal of radioactive wastes and other toxic wastes and (2) surface spills on the ground water regime. Transport phenomena in saturated and unsaturated porous and fractured media, particularly simultaneous flow of fluid and heat, and phenomena related to transport of material in solution. Parametric and physically based models of subsurface flow in the saturated and unsaturated zones. Fracture flow. Environmental assessment of the impacts of structures and excavations on the ground water regime. Permafrost and the ground water-permafrost relation in northern Canada. Surface Water Division investigates the interactions and exchanges between various phases of the hydrologic cycle. Flow systems and water balances in selected Canadian drainage basins. Effects of land drainage on stream hydrographs. River channel modification by fluvial processes. Parametric, stochastic and physically based models. Theory and rationale of modelling and investigation of limitations to modelling imposed by coarseness of model structure and imperfect knowledge of prototype. Regional evaporation. Water balance of arctic and subarctic basins. Freeze-up and break-up of rivers and lakes. River ice jamming. Hydrology of ground ice and aufeis. Examination of hydrologic aspects of northern development. Mountain hydrology. Snow and ice melt in hydrologic models. Remote sensing as a source of data for operational models. Techniques of interpreting remotely sensed data. Instrumentation for collection, recording and transmitting data. Microwave and infrared properties of wet and dry snow. Snowpack structure, its evolution during melting periods and its effects on runoff behaviour. Extraction and use of ice cores for developing paleoclimatic records. Physics of glaciers and ice caps. Glacier mass, energy and water balances. Glacier inventory of Canada. Fundamental properties of ice as a material. Snow properties, mechanics and structure and its effects on water flow and runoff. Gamma ray snow surveys.

Facilities: Glacier ice drill and corer.

**National Water Research Institute**

867 Lakeshore Road, Burlington, Ontario L7R 4A6

Contact: D. Egar, Director, Tel: (416) 637-4288

Personnel: Data not available.

Activities: Programs are conducted by 5 research divisions - Aquatic Ecology, Aquatic Physics and Systems, Analytical Methods, Environmental Contaminants, and Hydraulics and in the two regional units. NWRI is conducting studies that have drawn new subject-specific resources to the Institute in the areas of contaminants and eutrophication, contracting into the Hydraulics laboratory, long-range transport of airborne pollutants (including acid rain), aquatic impact of energy development, infestation by aquatic weeds, and investigations for the Canada - United States Great Lakes Water Quality Agreement.

Facilities: Standard & specialized Laboratory and Field Equipment.

**National Wildlife Research Centre - L.R.T.A.P. Section**

100 Gamelin Boulevard, Hull, Québec K1A 0E7

Contact: K. Fisher, C.W.S. - L.R.T.A.P. Co-ordinator, Tel: (819) 997-1410

Personnel: Data not available.

Activities: Research on the effects of acid rain on Canadian wildlife and its habitat.

**National Wildlife Research Centre - Toxic Chemicals Program Section**

100 Gamelin Blvd, Hull, Québec K1A 0E7

Contact: Mr. W.K. Marshall, Section Head, Tel: (819) 997-1410

Personnel: Data not available.

Activities: Study of the effects of pesticides used in agriculture and forestry on wildlife and its habitat. Management of the tissue bank of the collected specimens of Canadian wildlife for the future toxic residues measurements.

**National Wildlife Research Centre - Environmental Chemistry Section**

100 Gamelin Blvd., Hull, Québec K1A 0E7

Contact: Dr. R.J. Norstrom, Section Head, Tel: (819) 997-1410

Personnel: Data not available.

Activities: Measurement of toxic chemicals residues in the tissues of wildlife, study of bioenergehis of Herring Gulls, organochlorine residues in polar bears and in marine mammals.

Facilities: GC/MS (Hewlett-Packard).

**Parks Canada - Archeological Research Centre**

1600 Liverpool Court, Ottawa, Ontario K1A 1G2

Contact: D.L. Herst, Chief Archaeologist, Tel: (613) 993-9692

Personnel: Total is 51.

Activities: The study of archaeologically recovered artifacts in order to identify date, place of origin, ethnic/cultural identity of products, type and probable use.

**River Road Environmental Technology Centre**

River Road, Ottawa, Ontario K1A 1C8

Contact: D A Williams, Assistant Director, Tel: (613) 998-4130

Personnel: Total is 65.

Activities: Provides - Comprehensive air pollution measurement services including the development of new measurement technology - vehicle emissions measurement capability and advice on all aspects of automobile emissions control technology - the development and demonstration of environmental emergencies countermeasures technology - a full range of analytical laboratory services.

Facilities: Gas Chromatograph - Mass Spectrometer; Chasis Dynamometer

#### **Wastewater Technology Centre**

867 Lakeshore Road, Burlington, Ontario L7S 1A1

Contact: Mr. B. Jank, Assistant Director, Tel: (519) 637-4374

Personnel: Total is 50.

Activities: Evaluates, develops and demonstrates physical, chemical and biological processes for treating wastewaters, and treatment, reuse, and disposal technologies for wastewater residues and hazardous wastes.

Facilities: High-head pilot plant area; mobile wastewater treatment demonstration units; gas chromatograph; mass spectrometer.

#### **Water Planning and Management Branch**

Ottawa, Ontario K1A 0E7

Contact: R.L. Pentland, Director, Tel: (613) 997-2071

Personnel: Data not available.

Activities: Depending upon the nature of the work being conducted the Water Planning and Management Branch program activities can fall within any of the three stages - preplanning studies, planning studies or implementation activities. Research studies are undertaken at any one of these three stages. Topics may include water quantity, water quality, flood control, environmental impacts, socio-economic, water data, etc.

#### **Water Quality Laboratory**

867 Lakeshore Road, Burlington, Ontario L7R 4A6

Contact: Dr. B.K. Afghan, Chief, Water Quality Laboratory, Tel: (416) 637-4661

Personnel: Data not available.

Activities: The Water Quality Laboratory serves the needs of Environment Canada's ambient water quality monitoring program across Canada for complex analyses of environmental samples of water, sediment and biota.

Facilities: Inductively Coupled Argon Plasma Systems; High Resolution Gas Chromatography/Medium Resolution Mass Spectrometers; Automated Laboratory data management system based on VAX 11/75.

#### **Water Resources Branch**

Place Vincent Massey, 351 St. Joseph Blvd., Hull, Québec K1A 0E7

Contact: J.E. Slater, Director, Tel: (819) 997-1508

Personnel: Data not available.

Activities: The collection, processing, analysis, storage, interpretation, and provision of water quantity and sediment data for water resources management.

### **FISHERIES AND OCEANS**

#### **Bayfield Laboratory for Marine Science and Surveys**

867 Lakeshore Road, Burlington, Ontario L7R 4A6

Contact: G.R. Douglas, Regional Director General, Tel: (416) 637-4339

Personnel: Total is 166.

Activities: The Bayfield Laboratory conducts hydrographic surveys for the production of navigational charts and related publications for the inland waters of Ontario and Manitoulin and marine waters of Hudson Bay region and central Arctic. Activities include hydrographic development, tides and water levels monitoring, chart compilation and cartographic development and survey electronics which includes research in sea ice classification radar.

#### **Bedford Institute of Oceanography**

P.O. Box 1006, Dartmouth, Nova Scotia B2Y 4A2

Contact: Dr. A.R. Longhurst, Regional Director General, Tel: (902) 426-3492

Personnel: Total is 617.

Activities: Bedford Institute of Oceanography, owned and operated by Ocean Science and Surveys (DFO), is a multi-departmental, multi-disciplinary institute which not only undertakes a full spectrum of ocean research and service functions for the East coast and Arctic, but also has a significant role in international marine science activities. Client sectors include defence, marine transportation, energy, fisheries, environment, industrial development and recreation. OSS components are Atlantic Oceanographic Laboratory (physical and chemical oceanography and ocean instrumentation), Marine Ecology Laboratory (biological oceanography and environment/community studies) and Canadian Hydrographic Service (chart production and navigation).

Facilities: In addition to a fleet of ships and launches, BIO has much special equipment, including prototypes (in-house designs), ranging from satellite reporting data collection packages and navigation systems to sensitive advanced sonar for study of marine communities.

#### **Canadian Hydrographic Service**

615 Booth Street, Ottawa, Ontario K1A 0E6

Contact: J. O'Shea, Chief, Planning, Tel: (613) 995-4329

Personnel: Total is 113.

Activities: Not available

Facilities: Automated drafting equipment.

**Champlain Centre for Ocean Sciences**

P.O. Box 15,500, 901 Cap Diamant, Quebec City, Quebec G1K 7Y7

Contact: Mariette Tremblay, Director, Tel: (418) 694-7781

Personnel: Total is 51.

Activities: Not available

**Fisheries Development Branch - Newfoundland Region**

P.O. Box 5667, St. John's, Newfoundland A1C 5X1

Contact: Mr. F. Slade, Director,

Personnel: Total is 7.

Activities: Conducts research and development in four principal areas: (1) quality improvement; (2) cost reduction (efficiency/productivity improvement); (3) commercial resources surveys/development of underutilized resources; (4) product development. This covers investigations on vessel design, harvesting gear design and operation, energy conservation measures, storage and transportation, product and processing research and development, and aquaculture. The emphasis currently is on R&D support for the primary sector of the fishing industry.

**Fisheries Development Branch - Québec Region**

P.O. Box 15,500, 901 Cap Diamant, Québec City, Québec G1K 7X7

Contact: Mr. J.G. Beaudoin, Director, Tel: (819) 694-3817

Personnel: Total is 4.

Activities: Conducts research and development in four principal areas: (i) quality improvement; (ii) cost reduction (efficiency/productivity improvement); (iii) commercial resource surveys/development of underutilized resources; (iv) product development. This covers investigations on vessel design, harvesting gear design and operation, energy conservation measures, storage and transportation, product and processing research and development, and aquaculture. The emphasis currently is on R&D support for the primary sector of the fishing industry.

**Fisheries Development Branch - Scotia Fundy Region**

P.O. Box 550 Hollis Building, Halifax, Nova Scotia B3J 2S7

Contact: Mr. W.D. McDougall, Director, Tel: (902) 426-8110

Personnel: Total is 17.

Activities: Conducts research and development in four principal areas: (1) quality improvement; (2) cost reduction (efficiency/productivity improvement); (3) commercial resource surveys/development of underutilized resources; (4) product development. This covers investigations on vessel design, harvesting gear design and operation, energy conservation measures, storage and transportation, product and processing research and development, and aquaculture. The emphasis currently is on R&D support for the primary sector of the fishing industry.

**Fisheries Development Branch - Gulf Region**

P.O. Box 5030, Moncton, New Brunswick E1C 9B6

Contact: Mr. R. Gallant, Divisional Chief, Tel: (506) 758-9044

Personnel: Total is 9.

Activities: Conducts research and development in four principal areas: (1) quality improvement; (2) cost reduction (efficiency/productivity improvement); (3) commercial resource surveys/development of underutilized resources; (4) product development. This covers investigations on vessel design, harvesting gear design and operation, energy conservation measures, storage and transportation, product and processing research and development, and aquaculture. The emphasis currently is on R&D support for the primary sector of the fishing industry.

**Fisheries Development Division - Western Region**

501 University Crescent - Freshwater Institute, Winnipeg, Manitoba R3T 2N6

Contact: Mr. S.K. Law, Director, Tel: (204) 269-7379

Personnel: Total is 6.

Activities: Conducts research and development in four principal areas: (i) quality improvement; (ii) cost reduction (efficiency/productivity improvement); (iii) commercial resource surveys/development of underutilized resources; (iv) product development. This covers investigations on vessel design, harvesting gear design and operation, energy conservation measures, storage and transportation, product processing research and development, and aquaculture. The emphasis currently is on R&D support for the primary sector of the fishing industry.

**Fisheries Research Branch - Gulf Region**

P.O. Box 5030, Memramcook, New Brunswick E0A 1X1

Contact: Mr. J.S. Loch, Research Director, Tel: (506) 288-6200

Personnel: Total is 96.

Activities: Research focuses both on marine and freshwater fisheries; cooperative studies are carried out with Maritime communities and other government laboratories. Programs underway include: marine fish parasites studies; stock assessment and biology of salmon, gaspereau and eels, culture of marine molluscs and salmonids; impact of man's activities on marine and freshwater ecosystems; protection of habitats critical to the life cycle of important species. Field stations are located in N.S., P.E.I., Nfld. and N.B. both at freshwater and marine sites. Laboratory facilities are also located on the campus of the University of Moncton, University of P.E.I., and at the Eilerslie Field Station.



#### **Fisheries Research Branch - Newfoundland Region**

P.O. Box 5667, St. John's, Newfoundland A1C 5X1

Contact: Mr. M.C. Mercer, Research Director, Tel: (709) 772-2028

Personnel: Total is 220.

Activities: The fisheries research programs of the Fisheries Research Branch are directed toward the provision of essential scientific information for effective management and rational use of marine and freshwater fish, shellfish and marine mammal resources in the Newfoundland and Labrador area. Research responsibilities extend from the Laurentian Channel and Grand Banks to Davis Strait involving temperate, sub-Arctic and Arctic investigations in fisheries service. With the advent of increased offshore oil activity in the Newfoundland-Labrador region, a research program on the lethal and sub-lethal effects of oil on various stages in the life history of marine organisms has commenced. Research directed at protection of the habitat of marine and freshwater species is also conducted by the branch. Research is conducted into the life history, ecology and population dynamics of the major groundfish, pelagic, shellfish, marine mammal, freshwater and anadromous species in the Newfoundland-Labrador area. Research also includes mechanisms involved in the complex interaction between the various species within the ecosystem. Further work is undertaken on the effects of natural and man-made contamination of freshwater and marine resources in keeping with fish habitat research and management functions as well as studies of pathogenic bacteria particularly on the relationships of endotoxin structure and virulence of fish pathogens. Collaborative undertakings are well established with the Marine Sciences Research Laboratory and Memorial University.

#### **Inspection Division - Seafood Technology**

P.O. Box 5667, St. John's, Newfoundland A1C 5X1

Contact: Mr. D. White, Division Chief (Dr. R. Botta/Unit Chief), Tel: (709) 737-4424

Personnel: Data not available.

Activities: Technological research, support and consulting services in basic and applied seafood science are provided for use by the Inspection Branch and the Newfoundland fishing industry. Investigations and advisory services are concerned with handling, processing and preservation of fish and fish products on-board and at factories and the further utilization of under-utilized species. Emphasis is placed on scientific support to inspection and quality improvement programs.

#### **Fisheries Research Branch - Ontario Region**

867 Lakeshore Road, P.O. Box 5060, Burlington, Ontario K7R 4A6

Contact: Dr. R.L. Thomas, Research Director, Tel: (416) 637-4568

Personnel: Total is 44.

Activities: The Great Lakes Fisheries Research Branch is located in the western end of Lake Ontario at the Canada Centre for Inland Waters in Burlington. There are also two regional labs at Owen Sound, on Georgian Bay, and at Sault Ste. Marie, on Lake Superior. Limnological and fisheries research and surveillance tests the effects the eutrophication and contaminants on Great Lakes water quality, biota, community structure and productivity. Simular studies on smaller Ontario lakes determine the impacts of acid precipitation as part of national toxicology and contaminants dynamics develops water quality objectives and more rapid methods for hazard evaluation and assessing toxicity in the field. An ultra-trace chemicals laboratory located at CCIW, serves the needs of fish research as well as fish quality inspection. New studies of particular interest include: (1) fish habitat rehabilitation; (2) the effects of contaminants on conversion efficiency in natural food changes; and (3) the application of quantitative structure activity relationships to hazard assessments of contaminants.

#### **Fisheries Research Branch - Pacific Region**

Hammond Bay Road - P.O. Box 100, Nanaimo, British Columbia V9R 5K6

Contact: Dr. R. Beamish, Research Director, Tel: (604) 541-7040

Personnel: Total is 231.

Activities: Research studies are carried out on fin fish, invertebrate and marine mammal resources, and on their habitats, in support of the management, protection and enhancement of the resources of Canada's Pacific Coast, including the 200 mile economic zone. Programs include studies of developmental biology, life history, nutrition, parasites and diseases, behavior, physiology, endocrinology, genetics, ecology, population dynamics, stock assessments and abundance predictions. Programs on aquaculture, enhancement of salmon populations and effects of pollutants and physical disturbances (eg., forestry practices) are included. These research activities are based at the establishment above and at the West Vancouver Laboratory, 4160 Marine Drive, Vancouver, B.C., V7V 1N6.

#### **Development Division**

Hammond Bay Road - P.O. Box 100, Vancouver, British Columbia V6E 2P1

Contact: Mr. R. McIlwaine, Division Chief, Tel: (604) 544-2685

Personnel: Data not available.

Activities: Conducts research and development in four principal areas: (i) quality improvement (ii) cost reduction (efficiency/productivity improvement) (iii) commercial resource surveys/development of underutilized resources (iv) product development. This covers investigations on vessel design, harvesting gear design and operation, energy conservation measures, storage and transportation, product and processing research and development, and aquaculture. The emphasis currently is on R&D support for the primary sector of the fishing industry.

#### **Technology Services Division**

Hammond Bay Road - P.O. Box 100, Vancouver, British Columbia V6T 1X2

Contact: Dr. H. Tsuyki, Division Chief, Tel: (604) 224-1366

Personnel: Data not available.

Activities: Research and development are carried out on all phases of fishery science and technology applicable to the primary fishing industry and consistent with Regional needs. Programs include: development of systematic technological database to assess quality of commercial species as affected by variations in season, sexual maturity and geographic area; engineering research to improve, modify or develop new systems of chilled and frozen storage and biochemical and food science research to assess the effects of these changes on the quality of commercial species; engineering studies to improve or develop pumping systems for vessel to vessel and vessel to shore fish transfer; investigations on chilled and frozen storage life extension; fish roe technology; microbiology of fish spoilage; studies on botulism; chemical assessment of marine plants for polysaccharide

extractives; develop systems for live holding shellfish for quality improvement and for depuration of contaminants; technology transfer to the fishing industry.

#### **Fisheries Research Branch - Québec Region**

Gare Maritime Champlain, P.O. Box 15,500, 901 Cap Diamant, Québec City, Québec G1K 7X7

Contact: Dr. J. Boulva, Research Director, Tel: (819) 694-3478

Personnel: Total is 57.

Activities: Research focuses on marine fisheries, and studies are often carried out in cooperation with Quebec universities or other government laboratories. Programs are underway in the following areas: stock delineation and assessment, and determination of yields for exploited stocks; life cycle and ecology of fish, invertebrate and marine mammal species of the Gulf of St. Lawrence and St. Lawrence estuary; structure and dynamics of marine ecosystems in the same areas; impact of man's activities (eg. pollution, hydroelectric development) on marine ecosystems; and protection of habitats critical to the life cycle of important species. Laboratory facilities are also located at the University of Rimouski.

#### **Arctic Biological Station**

Gare Maritime Champlain, P.O. Box 15,500, 901 Cap Diamant, Québec City, Québec G1K 7X7

Contact: Dr. J. Boulva, Research Director, Tel: (819) 694-3478

Personnel: Data not available.

Activities: Life history, ecology and population dynamics of marine mammals in arctic and eastern Canadian waters and of marine and anadromous fishes of the arctic and subarctic, and the effects of environmental disturbance on these animals. Productivity of benthos, plankton and fish of potential value in assessing the effects of man's activities on the arctic marine environment. Physiological studies on marine invertebrates and evaluation of the effects of arctic crude oils on the invertebrate fauna. Assessment of seasonal fluctuation of microbial flora in northern marine waters and its ability to degrade arctic crude oils.

#### **Fisheries Research Branch - Scotia Fundy Region**

P.O. Box 550, Halifax, Nova Scotia B3J 2S7

Contact: Dr. J.E. Stewart, Research Director, Tel: (902) 426-3130

Personnel: Total is 327.

Activities: Research is divided into 2 broad categories involving major programs of the Invertebrates and Marine Plants Division and component programs of the Fisheries and Environmental Sciences Division. The Invertebrates and Marine Plants Division conducts research into the life history, ecology, population dynamics, species-interactions and stock assessments of the major shellfish and marine plant species in the Maritimes. The Fisheries and Environmental Sciences Division conduct comprehensive and fundamental research on fish and shellfish with emphasis on disease, nutrition, growth physiology and effects of contaminants. Major field-oriented research programs are directed to studies on population assessments, exploitation, growth, angling harvest and spawning success of freshwater and anadromous species, particularly Atlantic salmon, in Nova Scotia and southern New Brunswick. In addition, salmon enhancement programs involving biological investigations, engineering technology and fish culture operations are conducted to expand and rehabilitate stocks in selected rivers and lakes. Applied research on environmental factors (including acidification) impacting on the habitat of freshwater dependent species.

#### **St. Andrew's Biological Station**

P.O. Box 550, St. Andrew's, New Brunswick E0G 1X1

Contact: Dr. J.E. Stewart, Research Director, Tel: (902) 426-3130

Personnel: Data not available.

Activities: Research is divided into 3 broad categories which follow current divisional lines. The first 2 divisions cover the marine vertebrate and invertebrate fisheries by conducting research into the biology and management of fisheries resources through studies of life history, ecology, behavior, population dynamics and stock assessment. The third broad category is one of environmental studies of the effects of local industries and resource management practices, including the sublethal effects of pollutants on commercially important fish and invertebrates, their environment and the fisheries they support. There are additional programs based on endocrinology, genetics and physiology in support of resource management and development. The Biological Station is located on Passamaquoddy Bay. Research programs are also undertaken in collaboration with the Huntsman Marine Laboratory, and North Atlantic Salmon Research Centre.

#### **Fisheries Research Branch - Western Region**

501 University Crescent - Freshwater Institute, Winnipeg, Manitoba R3T 2N6

Contact: Dr. G.B. Ayles, Research Director, Tel: (204) 949-5268

Personnel: Total is 142.

Activities: Responsible for research relative to freshwater, freshwater fisheries, and Arctic marine fish and marine mammals. Fish habitat and limnological research emphasizes mechanisms and processes of biological production and decomposition in lakes, and includes problems related to energy development and use; in particular, acidification radionuclide and heavy metal pollution, hydroelectric reservoirs and toxic chemicals. Research in the development of the fisheries resource includes intensive aquaculture using waste heat, pilot fisheries enhancement studies of large lakes, stream rehabilitation, studies of fish diseases and fish product development. Arctic research emphasizes commercially important fish, marine mammals and associated ecosystems. Scientific disciplines at the Freshwater Institute include population biology, organic and inorganic chemistry and toxicology, marine mammal biology, hydrology, and associated fields. Studies are carried out in laboratories at the Freshwater Institute and in the field stations located at varying latitudes ranging from north temperate to mid-Arctic (i.e. from 50 to 75 degrees north latitude).

#### **Institute of Ocean Sciences**

9860 West Saanich Road, Sidney, British Columbia V8L 4B2

Contact: Miss Kate Glover, Information Officer, Tel: (604) 656-8217

Personnel: Total is 309.

Activities: The Institute of Ocean Sciences is a centre for oceanographic research and the provision of hydrographic services. Oceanographic research encompasses the fields of physics, chemistry and ecology and is focussed on the coastal waters of

British Columbia, the north Pacific Ocean and the Western Canadian Arctic. The Hydrographic Service conducts field surveys to provide information in the form of charts, tide and current tables, sailing directions, etc. for the coastal waters of British Columbia, the western Arctic and the navigable fresh waters west of the Manitoba border. Coastal oceanography examines the processes of flushing and mixing, circulation and water transport on the coast and continental shelf. Studies in the channels and confined waters are related to biological productivity, transport and dispersion of pollutants and nutrients. Long term studies investigate the physical, chemical and biological parameters in the northeast Pacific and the variability of the circulation of the Alaskan gyre. Arctic oceanography is conducted in the Beaufort Sea, the waters of the Canadian Arctic archipelago and adjacent waters of the Arctic Ocean. Studies are concerned with the seasonal circulation of Arctic fjords and continental shelf; the dynamics of sea-ice; the processes of ice growth and decay and the air/ice/water energy budget. Theoretical studies, remote sensing and numerical modelling forms an integral part of the forgoing studies. Chemical oceanographic studies relate to trace heavy metals in the marine environment and the global carbon dioxide budget. In the field of ecology plankton and benthic invertebrate distribution and ecology are studied in relation to production, physical forcing mechanisms, pollution and ocean dumping. Marine environmental data review and assessment, marine climatological data studies, data compilation and quality assessment are undertaken as part of an ocean information service.

Facilities: (i) Four large vessels ranging from 1314 to 97 gross tons, one large vessel on charter at 1378 gross tons and one Hydrographic Survey vessel under construction at 1600 gross tons. When construction is completed the Institute will have two large vessels rated Ice Class I. One submersible at 5 gross tons and 27 launches and smaller vessels under 12 gross tons. (ii) Sperry 1100/60 computer utilizing a Sperry DCP/20 front end communication processor which allows high speed computer graphics and protocol flow control to intelligent devices. Microcom 300/1200 bps modems are used. (iii) A water tunnel of overall length 10.5 metres has a laminar flow working section of 1.3 metres length and 30 cm by 30 cm cross section. Flow speeds can be obtained within the range of 0 to 12 metres per second. Internal pressure can be adjusted to permit the lid of the working section to be removed exposing the free water surface.

#### **Marine Environmental Data Services Branch**

200 Kent Street, 12th Floor, Ottawa, Ontario K2P 2J8

Contact: Dr. J.R. Wilson, Director, Tel: (613) 990-0268

Personnel: Total is 42.

Activities: To acquire, process and archive tide and water level data, measured wave data, and physical-chemical oceanographic data; to provide data processing and expertise to the international oceanographic community; to provide data, data products and ocean information on request; to develop improved methods and techniques in data processing and archiving, new data products.

Facilities: Mini-computers and peripherals, plotter, digitizers, micro-computers, computer terminals, microfilm devices, waverider buoys and related equipment.

### **HEALTH AND WELFARE CANADA**

#### **Civil Aviation Medicine Units Laboratories**

P.O. Box 1035, Station B, Downsview, Ontario M3H 5V5

Contact: Dr. D. Elcombe, Chief, Civil Aviation Medical Units, Tel: (416) 630-8503

Personnel: Total is 6.

Activities: Pathology research relating to Civil Aviation.

Facilities: Chemical analysis equipment.

#### **Drugs Directorate**

Brooke Claxton Building, Boulevard de la Colombine, Ottawa, Ontario K1A 0L2

Contact: Debbie Hills, Chief Administrative Officer, Tel: (613) 990-8857

Personnel: Total is 435.

Activities: The Drugs Directorate consists of seven bureaux: Biologics, Dangerous Drugs, Drug Research, Drug Quality, Human Prescription Drugs, Nonprescription Drugs, and Veterinary Drugs. The Directorate is responsible for ensuring the safety and efficacy of human and veterinary drugs which are manufactured or offered for sale in Canada, as well as for the safety of cosmetics. New drug submissions and applications for proprietary medicines are evaluated nationally for their safety and efficacy, and also with respect to manufacturing and labelling aspects. The Directorate also licenses vaccines and other biological drugs for manufacture and sale. Surveillance programs are carried out to assess the safety, efficacy, pharmaceutical quality, advertising and manner of use of marketed drugs. It also carries out programs to control the misuse and abuse of drugs, particularly psychoactive ones, and to provide information to health professionals and to the general public on the quality and the wise use of drugs. The Drugs Directorate maintains the Bureau of Drug Research which carries out investigations in fields of toxicology (eg. carcinogenicity, mutagenicity, allergenicity) and of pharmaceutical chemistry and develops analytical methods in these fields. This laboratory expertise enables the Directorate to make informed decisions on drug safety, efficacy, and quality. The Bureau of Drug Research consists of four divisions: Chemical Standards, Drug Identification, Drug Toxicology, and Pharmaceutical Chemistry. One of the main functions of the Bureau relates to drug standards and the development of assay methods for synthetic drugs, for drugs of natural origin, and for impurities in drugs.

#### **Environmental Contaminant Directorate**

Jeanne Mance Building, Tunney's Pasture, Ottawa, Ontario K1A 0L3

Contact: Mr. C.E. Tupper, Director, Environmental Health Services, Tel: (613) 992-1864

Personnel: Data not available.

Activities: Protection of health of clients (Indian and Inuit, Public Servants, travellers and all Northern Residents) from those factors in the physical environment which may be hazardous.

#### **Environmental Health Directorate**

Brooke Claxton Building, Boulevard de la Colombine, Ottawa, Ontario K1A 0L2

Contact: Not Available.

Personnel: Total is 260.

Activities: The Environmental Health Directorate serves to protect Canadians from health hazards associated with natural and man-made environments, the components of which are the physical, chemical and technological encroachments in which modern man lives and works. Its main program areas are directed towards: the assessment and investigation of the health effects of environmental pollutants and health hazards associated with, and the control of, medical devices, radiation sources and hazardous products; in conjunction with the other organizational units of the Department, the assessment of the health effects of the Department, the assessment of the health effects of technological and sociological environments.

Facilities: Anechoic Chambers - Sound and Radiofrequency Whole Body Counter - Radiation.

#### **Environmental Health Lab**

Pharmaceutical Chemistry Building, Tunney's Pasture, Ottawa, Ontario K1A 0L3

Contact: Dr. J. Kirkbride, Director, Occupational Health, Tel: (613) 996-4921

Personnel: Total is 22.

Activities: Analytical and advisory services relating to environmental aspects of Indian and Inuit population, as well as to the health and safety of Federal Public Service.

Facilities: Air Flow Equipment; Chemical Analysis Equipment.

#### **Food Directorate**

Brooke Claxton Building, Boulevard de la Colombine, Ottawa, Ontario K1A 0L2

Contact: T. Theriault, Administration Officer, Tel: (613) 990-8983

Personnel: Total is 250.

Activities: In the Food Directorate, scientific activities protect the public against deficiencies in the nutritional quality of foods and from microbial and chemical hazards that might cause illness. Major organizational units are the bureaux of Chemical Safety, Microbial Hazards and Nutritional Sciences. The Food Directorate works together with the Field Operations Directorate in administering the food provisions of the Food and Drugs Act. Research divisions carry out studies in such fields as: microbial hazards in food; the toxicology and food chemistry of food additives, contaminants and components; the nutrient composition of food, nutritional status and bioavailability and effects of nutrients; and the development of analytical methods for use in monitoring and surveillance. Scientific evaluation divisions exert influence on food safety through contributions to the development of policies, guidelines and regulations that take account of data from research and regional laboratories and from detailed review of industry submissions (eg. regarding the use of food additives and agricultural chemicals). The risks and benefits of chemical use and of other changes in foods and eating habits are issues for which a scientific basis for decision is provided.

#### **Laboratory Centre for Disease Control**

Brooke Claxton Building, Boulevard de la Colombine, Ottawa, Ontario K1A 0L2

Contact: J.S. Baylis, Chief, Administrative Services, Tel: (613) 990-8972

Personnel: Total is 193.

Activities: The Laboratory Centre for Disease Control is mainly a service-oriented directorate, whose primary function is to provide epidemiological information, microbiological data, and diagnostic reagents to provincial governments, hospitals and laboratories. The directorate provides a national focal point and liaison in epidemiology and microbiology to international organizations, including the World Health Organization, Centre for Disease Control in the United States, and the Public Health Laboratory Services in England. The Centre for Disease Control has 5 scientific bureaux: Epidemiology, Infection Control, Medical Biochemistry, Microbiology, and Tobacco Control and Biometrics. The two disease surveillance bureaux, Epidemiology and Infection Control, monitor the incidence and causes of disease in Canada. They provide epidemiological assistance in epidemic situations and coordinate strategies for the control and prevention of communicable and non-communicable diseases. They also provide a surveillance system to study factors as potential causative agents in congenital anomalies, adverse reaction to drug products, and acute poisoning. In the field of infection control, special programs are designed to assist in reducing the high toll of hospital and laboratory-acquired infections. The Medical Biochemistry and Microbiology Bureaus provide services to assist provincial and clinical laboratories in the diagnosis and treatment of disease. The Tobacco Control and Biometrics Bureau develops alternative federal regulatory policies concerning the manufacture, importation, distribution, sales and use of tobacco products and psychotropic drugs, together with the provision of advice on statistical design and analysis of directorate projects, experimental surveys.

#### **Northern Medical Unit**

12815 - 115th Avenue, Edmonton, Alberta T5M 3A4

Contact: Dr. O. Schaefer, Director, Northern Medical Research Unit, Tel: (403) 453-5311

Personnel: Total is 1.

Activities: Northern Environmental Research.

## INDIAN AND NORTHERN AFFAIRS CANADA

### Eastern Arctic Scientific Resource Centre

Igloolik, Northwest Territories X0A 0L0

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Total is 1.

Activities: The laboratory is used to support seasonal research and for continuous research by four government departments. Current projects being undertaken include Seismology, Climatology, and Geomagnetism. Information collected is used by the Department, DOE, DFO, and EMR.

Facilities: Includes a micro computer, basic instrumentation, as well as special equipment for data collection on air pollution, geomagnetic variation, climatology and seismology.

## NATIONAL CAPITAL COMMISSION

161 Laurier Avenue West, Ottawa, Ontario K1P 6J6

Contact: J. Smrcka, Supervisor, Operating Budget Control, Tel: (613) 993-4142

Personnel: Total is 1005.

Activities: The National Capital Commission conducts or promotes research, plans and studies related to the development of the National Capital Region as a symbol of identity for all Canadians. The areas of programs in which this Commission are involved include land development, transportation, provision of services and utilities, the encouragement and assistance in activities of a recreational or cultural character, and the development and management of parks and parkways.

## NATIONAL DEFENCE

### Canadian Forces Environmental Medical Establishment

P.O. Box 2000, Downsview, Ontario M3M 3B9

Contact: Director, Tel: (613) 992-8440

Personnel: Total is 80.

Activities: CFEME is a military unit stationed with DCIEM. It does not perform research and development per se but works with DCIEM.

### Defence and Civil Institute of Environmental Medicine

P.O. Box 2000, Downsview, Ontario M3M 3B9

Contact: Director, Tel: (613) 992-8440

Personnel: Total is 164.

Activities: DCIEM, located on the Canadian Forces Base, Downsview, Ontario. The mission of DCIEM is to perform research and development to ensure the health and safety and effective utilization of man in any man-machine environment or in any adverse operational environment. The Institute also conducts cooperative work with non-military government departments, with industry, and various environments under study to perform human research in environments ranging from ocean depths, space, flight, to the arctic and the tropic.

Facilities: Portable Decompression Chamber; Atmospheric Diving System; Human Centrifuge; Precision Angular Mover.

### Defence Research Establishment: Suffield

Ralston, Alberta T0J 2N0

Contact: Director, Tel: (613) 992-8440

Personnel: Total is 186.

Activities: DRES, located at the CFB Suffield, Ralston, Alberta in addition to its laboratories has access to a secure serviced test area of about 1,000 square miles and its programs have a large field testing component. DRES conducts basic and applied research on medical and chemical aspects of chemical defence, microbiology, chemical and biological defence training, aerial targets and RPV's, mine/countermine warfare, military engineering applications, vehicle mobility research and the disposal of hazardous and toxic materials.

### Defence Research Establishment: Ottawa

Ottawa, Ontario K1A 0K2

Contact: Director, Tel: (613) 992-8440

Personnel: Total is 211.

Activities: DREO, located at Shirley's Bay, West of Ottawa, carries out applied research in a variety of areas including environmental protection, clothing, defensive aspects of nuclear, biological, and chemical warfare, electrical power sources, remote sensing, navigation, electronic warfare, satellite aided search and rescue, and some other aspects of space applications. DREO is also responsible for the military communications and radar research programs at the neighboring Communications Research Centre (CRC) of the Department of Communications.

Facilities: Mobile Lab - Radiation Measurement.

**Defence Research Establishment: Valcartier**

P.O. Box 880, Courcellete, Québec G0A 1R0

Contact: Director, Tel: (613) 992-8440

Personnel: Total is 623.

Activities: DREV, located adjacent to CFB Valcartier near Quebec City, conducts research in the fields of armaments, electro-optical aspects of surveillance and remote sensing, command and control, propellants, explosives, aerospace, lasers and weapon systems analysis.

Facilities: Mobile Lab - CO2 Laser Experiments; Pilot Plant - propellants and explosives.

**Defence Research Establishment: Pacific**

Victoria, British Columbia V0S 1B0

Contact: Director, Tel: (613) 992-8440

Personnel: Total is 140.

Activities: DREP, located in Victoria, B.C. is concerned primarily with research related to the problems of anti-submarine detection in the North Pacific and in the Arctic Archipelago, including research in the areas of underwater acoustics, magnetism, and fluid dynamics, and with materials research.

Facilities: Research Vessel - CFAV Endeavour.

**Defence Research Establishment: Atlantic**

P.O. Box 1012, Dartmouth, Nova Scotia B2Y 3Z7

Contact: Director, Tel: (613) 992-8440

Personnel: Total is 212.

Activities: DREA, located in Dartmouth, Nova Scotia, is a Maritime laboratory concerned with research related to the problems of anti-submarine defence in the North Atlantic including underwater acoustics, signal processing, transducer research, hydronautics and materials research.

**Operational Research and Analysis Establishment**

Ottawa, Ontario K1A 0K2

Contact: Director, Tel: (613) 992-8440

Personnel: Total is 141.

Activities: The function of the ORAE in NDHQ is largely oriented toward system analysis, logistic, strategic, social and economic analysis relative to the Canadian Forces.

**NATIONAL FILM BOARD**

**Technical Research Division**

3155 Cote de Liesse Road, St. Laurent, Québec H4N 2N4

Contact: A. Brunelle, Financial Advisor, Tel: (514) 333-3171

Personnel: Total is 9.

Activities: Research is directed towards making the NFB a centre for applied technical research and for the technical and artistic development of audiovisual communication. New impetus is being given to the applied research program and the modernization of facilities to meet the highest technical standards. Plans include the creation of a "Centre d'animation" where all research on computer assisted animation will be collected. Some 50 research projects are presently underway in response to current production needs.

Facilities: Motion picture and video equipment.

**NATIONAL MUSEUMS OF CANADA**

**National Museums of Canada - Headquarters**

300 Laurier Avenue West, Ottawa, Ontario K1A 0M8

Contact: Mike Morissette, Financial Planning Analyst, Tel: (613) 996-9374

Personnel: Total is 1051.

Activities: The National Museum of Natural Sciences develops and makes accessible collections of objects and knowledge in the natural and physical sciences.

**Botany Unit**

300 Laurier Avenue West, Ottawa, Ontario K1A 0M8

Contact: Mike Morissette, Financial Planning Analyst, Tel: (613) 996-9374

Personnel: Data not available.

Activities: Taxonomy, ecology and geographic distribution of vascular plants, bryophytes, lichens and algae. Monographic studies of genera. Regional floristics.

**Zoology Unit**

300 Laurier Avenue West, Ottawa, Ontario K1A 0M8

Contact: Mike Morissette, Financial Planning Analyst, Tel: (613) 996-9374

Personnel: Data not available.

Activities: Taxonomy, distribution, ecology, and behavior of mammals, birds, reptiles, amphibians, fishes, and all invertebrate groups, exclusive of insects, arachnids, nematodes, and certain parasitic groups that are the concern of other federal governmental agencies.

**Paleobiology Unit**

300 Laurier Avenue West, Ottawa, Ontario K1A 0M8

Contact: Mike Morissette, Financial Planning Analyst, Tel: (613) 996-9374

Personnel: Data not available.

Activities: Taxonomy and dispersal history of fossil vertebrates from Canadian Palaeozoic, Mesozoic, Tertiary, and Pleistocene deposits, with emphasis on dinosaurs and Pleistocene vertebrates. Palynological research involving light microscopy, pollen morphological studies on selected angiosperm families. Evolution of the fungi and symbiosis in general.

**Mineral Sciences Unit**

300 Laurier Avenue West, Ottawa, Ontario K1A 0M8

Contact: Mike Morissette, Financial Planning Analyst, Tel: (613) 996-9374

Personnel: Data not available.

Activities: Systematics, taxonomy and genesis of minerals and rocks, with emphasis on those from important Canadian geological occurrences.

**NATIONAL RESEARCH COUNCIL CANADA****Advanced Teleoperator System**

Ottawa, Ontario K1X 1X1

Contact: Not Available.

Personnel: Data not available.

Activities: Not available

**Algonquin Radio Observatory**

Lake Traverse, Ontario K0A 2L0

Contact: Not Available.

Personnel: Data not available.

Activities: Continuum and spectral line studies using the 46 cm radio telescope at the Algonquin Radio Observatory; time variations of Seyfert galaxies and quasars, and study of their structure and size by long baseline interferometry; intensity of 10 cm radiation from the sun and high resolution observations with 10 cm array. Optical studies of the solar photosphere and chromosphere.

**Atlantic Research Laboratory**

1411 Oxford Street, Halifax, Nova Scotia B3H 3Z1

Contact: Not Available.

Personnel: Data not available.

Activities: Established to complement as well as to assist other research facilities in the region, the laboratory program relates to building fundamental knowledge bases in areas relevant to the Atlantic region's economy. The main thrusts of the Laboratory's research are in four areas: marine plants, particularly algae; marine analytical chemistry, including the development of methods and reference samples for measuring minute quantities of toxic substances in sea water, sediments, and marine plants and animals; research in support of agriculture, including the effects of soil microbes on sheep and cattle growth; and research on extractive metallurgy and coal, including the chemical reactions occurring in the steel-making process.

**Biotechnology Research Institute**

Montreal, Quebec H1X 1X1

Contact: Not Available.

Personnel: Data not available.

Activities: This institute will contribute to the creation, development, understanding and diffusion of new knowledge in biotechnology in order to create employment, increase productivity and raise Canadian industry's competitive position in the world. Main areas of research are to include fermentation and biochemical and process engineering, genetic engineering, cell fusion, and enzyme technology.

**Canada Centre for Space Science: Gimli**

Gimli, Manitoba R0C 1B0

Contact: Not Available.

Personnel: Data not available.

Activities: The Mobile Scientific Balloon Launching Facility based at Gimli Airport some 90 km north of Winnipeg, launches high altitude balloons from several sites in Canada. The largest balloons launched have a volume of 570,000 m<sup>3</sup> and can lift instrument payloads weighing some 1,600 kg to altitudes of up to 40 km.

**Canada Centre for Space Science: Ottawa**

Sussex Drive, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: This centre's program includes: mission analysis and systems engineering for space science instrumentation; design and development of space science instrumentation for space shuttle and satellite flight systems including charged particle detection, optical detection and imaging, ultraviolet imaging, radar imaging and radio frequency plasma waves; design and development of rocket payloads, rocket vehicle systems, telemetry tracking and data processing systems for space science use; operation and maintenance of facilities for launching and recovering of scientific rockets and balloons.

**Canada Institute for Scientific and Technical Information**

Montreal Road, Ottawa, Ontario K1A 0S2

Contact: Michel Bergevin, Chief, Administrative Services, Tel: (613) 993-1075

Personnel: Total is 224.

Activities: The institute maintains the national collection of scientific, technical and medical literature and provides scientific, technical and medical information to the people and government of Canada to assist in activities related to the economic, regional and social development of Canada. Major activities include the administration of CAN/OLE, the Canadian online enquiry system, CAN/SDI, the Canadian service for the selective dissemination of information, CAN/SND, scientific numeric databases, the largest lending and photocopying service in Canada and a reference, referral and literature searching service.

**Division of Biological Sciences**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: As listed below.

**Biotechnology Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: The use of living organisms, plant or animal cells and their parts - to produce commercial goods and services - is centered at three locations in Canada: NRC's Division of Biological Sciences in Ottawa, the Plant Biotechnology Institute in Saskatoon, and the Biotechnology Research Institute being established in Montreal. Altogether these establishments will house almost 600 scientists, engineers, and technology staff and will extend the co-ordinated national program of research and development into living systems and their materials.

**Cell Physiology Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Control systems in cell proliferation; the earliest steps in DNA synthesis in normal and cancer cells; the role of calcium ion and cyclic AMP as controls.

**Animal Physiology Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Environmental effects on physiological systems: mechanisms of acclimation to cold; structure and function of noradrenergic vesicles in sympathetic endings of brown adipose tissue; blood flow regulation in brown adipose tissue; bioelectric phenomena.

**Ecotoxicology Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Behavior and toxicology of environmental contaminants, particularly heavy metals; mechanisms of toxicity at molecular level.

**Biomathematics Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Statistics, computations, design of experiments, computer modelling and simulation techniques.

**Microbiology and Immunochemistry Units**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Anaerobic microbiology, methanogenic bacteria, hydrogenases, continuous culture studies, enterotoxins, growth of pathogenic bacteria. Antigens of pathogenic bacteria, neisseria species, chlamydia, penumococcus, streptococcus; structure-function in polysaccharide antigens, use in vaccines and diagnostics; synthetic antigens; monoclonal antibody from hybridomas; immunoglobulins.



**Biological Production of Fuels Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Biogas fermentation; practical production of biogas from sewage sludge and food wastes; preservation of fruits and vegetables by high-humidity refrigerated storage.

**Molecular Genetics Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Cloning of genes in yeast and bacteria; transformation of yeast; studies on gene expressions; synthesis of genes and of linker segments for plasmid linking; structure of chromatin; restriction enzymes; ribosomes structure.

**Molecular Biophysics and Biochemistry Units**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Use of nuclear magnetic resonance and electron spin resonance to study structure-function relations in biological systems; the dynamics of biological membranes; definition of receptor sites.

**Cell Biophysics Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Biosynthesis of cellulose; fibrogenesis in cells; electron microscopy.

**X-Ray Crystallography Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Crystal structures of compounds of biological interest, nucleotides, pharmaceuticals; correlation of structure with biological activity.

**Molecular Biochemistry Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Protein biochemistry; isolation and characterization of enzymes, hydrogenases, protein kinases, sulfatases; studies of enzyme-substrate reactions by laser Raman spectroscopy and fluorescence spectroscopy.

**Division of Building Research**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: The Division of Building Research of NRC was established in 1947, to provide a research service to the construction industry of Canada. It is organized on a multi-disciplinary basis to cover the subject areas of performance and properties of building materials and components, building services, energy, structures, noise, vibration, fire, geotechnical, building use and performance, and provision of technical information. The Division has major research facilities in Ottawa and regional laboratories in Saskatoon, Vancouver, Revelstoke and Halifax.

Facilities: In addition to well equipped laboratories, these facilities have specialized equipment developed specifically for building research, including furnaces for fire studies; large calorimeter boxes for determining the thermal performance of walls, windows, and other structural elements; and cold rooms for low temperature investigations.

**Prairie Regional Station**

Montreal Road, Saskatoon, Saskatchewan S7N 0W0

Contact: Not Available.

Personnel: Data not available.

Activities: The Prairie Regional Station is operated by NRC's Division of Building Research (DBR) to provide technical information to the construction industry in the three Prairie Provinces for improved design, construction and operation of buildings and other structures. The Station conducts research projects as a basis for its technical information services, and provides a communication link between the design professions, the construction agencies, the users of buildings, and NRC's Building Research Centre in Ottawa.

**Rogers Pass Field Station**

Montreal Road, Revelstoke, British Columbia V0E 2S0

Contact: Not Available.

Personnel: Data not available.

Activities: As a part of its geotechnical work, DBR personnel study massive snow slides (avalanches) at Rogers Pass in the Rocky Mountains. The data gathered is used to design means of protecting roads, railways, and skiers from avalanches.

**Atlantic Regional Station**

Montreal Road, Halifax, Nova Scotia B3H 3Z1

Contact: Not Available.

Personnel: Data not available.

Activities: The Station's main role is to provide assistance to the construction industry in the Atlantic provinces by drawing on research, testing, and standards work done by DBR and other sources. It also provides DBR researchers in Ottawa with information on problems encountered in Atlantic Canada.

**British Columbia Regional Station**

Montreal Road, Vancouver, British Columbia V6R 1P5

Contact: Not Available.

Personnel: Data not available.

Activities: Provides a link between the building industry in B.C. and the Division of Building Research (DBR) of NRC in Ottawa. Its major function is to provide an information service related to the technical aspects of building design, construction and performance.

**Division of Chemistry**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: As listed below.

**Analytical Chemistry Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including trace analysis of marine waters, sediments and biological materials; inductively coupled plasma - optical emission spectroscopy; atomic absorption spectroscopy (GFAAS and FASS); spark source mass spectroscopy; trace metal separations and concentrations; gas chromatography - mass spectrometry; x-ray fluorescence spectroscopy.

**Chemical Engineering Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including reverse osmosis, ultrafiltration, sludge and emulsion treatment, fluid-particle technology, size enlargement, fine coal beneficiation methods. Cooperation with industry in both laboratory and plant environment.

**Chemical Physics Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including electrical and optical properties of thin film semiconductors; electron spin resonance; spectroscopy and kinetics of transient species on the nanosecond time scale.

**Colloid and Clathrate Chemistry Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including extraction of bitumen oil sands by spherical agglomeration; emulsions and suspensions; chemistry of heavy oils; molecular orbital and intermolecular potential theory; study of clathrate hydrates and other solids by NMR, dielectric, and calorimetric methods. Applies the concepts of colloid science to the solution of problems of industrial concern.

**High Polymer Studies Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including ionic polymerization mechanisms with special reference to stereoregulation processes.

**High Pressure Studies Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including physical chemistry at high pressures (kinetics of reactions in solutions, infrared and Raman spectra, phase transformations, structure, x-ray diffraction, inorganic chemistry, etc.)

**Hydrocarbon Chemistry Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Investigates the rates and mechanisms of free-radical reactions in solution; studies the structures and reactivities of carbenes and free-radicals; synthesizes new antioxidants and tests their effectiveness in vitro; conducts studies on normal and isotopically labelled vitamin E and investigates the biological role of the vitamin in normal and cancerous tissue.

**Kinetics and Catalysis Studies Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including chemical reactions of atmospheric interest; chemisorption and heterogeneous catalysis; electron spin resonance spectra and structure of organo-metallic and inorganic free radicals.

**Photochemistry and Kinetics Studies Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Fundamental processes in the photochemistry of gases, including visible ultra-violet systems and infrared multiphoton reactions using pulsed lasers; investigates kinetics of the reactions of atoms, free radicals in gas-phase thermal, photochemical and radiation chemistry systems; explores the microscopic dynamics of elementary reactions of atoms, free radicals and molecules in the gas phase using infrared chemiluminescence and molecular-beam techniques; examines reactions of transient species in liquid-phase photochemical systems in the nanosecond and picosecond time regime.

**Laser Chemistry Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including laser induced chemical processes: isotope separation; multiphoton effects; photo-selective organic synthesis; remote sensing; transient detection, kinetics and dynamics using laser induced fluorescence, multiphoton ionization and time-of-flight mass spectrometry; inorganic photochemistry emphasizing metal atom reactions. Promotes the use of laser technology in industrial applications.

**Metallic Corrosion and Oxidation Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including mechanisms and kinetics of metal oxidation; electrochemistry; surface film characterization. Provides advice on corrosion related problems.

**Molecular Spectroscopy Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including infrared and Raman spectroscopy; vibrational spectra of complex molecules of biological importance, including membranes; vapor phase Raman intensities and band contours; development of new vibrational Fourier transform techniques. Investigates the structure of aqueous surfactants; maintains computer-based programs for the automatic identification of materials from their infrared spectra.

**Organic Chemistry Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including partial and total synthesis of biologically interesting molecules (steroids, alkaloids, antibiotics, anticancer agents); transformation of natural products; scope and mechanism of new reactions; electro-organic synthesis. Administers the Federal Energy Conversion and Hydrogen Storage Program.

**Solid State Chemistry Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including chemistry and physics of metals, alloys and compounds; solid state inorganic chemistry; x-ray diffraction and crystallographic computation.

**Textile Chemistry Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including photochemistry of fibre-forming polymers; UV stabilization; morphology of polymers and composites; x-ray diffraction; flammability, flame retardants; thermal analysis. Evaluates technical methods for fibres and fabrics including the international methods and develops test methods and standards suitable for Canadian needs.

**Theoretical Chemistry Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Studies equilibrium and dynamical properties of solids and liquids; the dynamics of laser-excited resonance fluorescence in atoms and molecules by analytical methods; the generation and decay of excited and ionized states in molecules and molecular crystals by quantum-mechanical methods with special emphasis on organic systems; static and dynamic properties of biomolecules and bi-polymers including protein folding and enzyme action through computer simulation.

**Thermochemistry Studies Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Thermodynamic properties of liquids and binary mixtures; uses calorimetric techniques to determine the heat capacities and excess enthalpies of binary liquid mixtures; investigates the volumetric properties of liquids through density, dilatometric and ultrasonic measurements; and correlates thermodynamic data by means of empirical and theoretical relations.

**Division of Electrical Engineering**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: As listed below.

**Computer Technology Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including development of advanced hardware/software technology in the areas of computer graphics, image processing, signal processing, industrial sensors, information storage and retrieval, data base techniques and interactive man-computer systems. Emphasis on technology, new innovative products and processes and other such areas contributing to economic development and industrial productivity.

**Electromagnetic Engineering Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Develops mathematical techniques for the solution of fundamental problems in electromagnetic and antenna theory and problems of interest to other sections; develops measurement and maintains facilities for the design and evaluation of antennas and for the analysis of electromagnetic interference; by membership on Canadian Standards Associations Committees assists in the production of standards dealing with electromagnetic interference; applies radar principles to study the polarization effects of precipitation; promotes the direct conversion of microwave energy to heat for industrial applications, and develops moisture and electromagnetic radiation sensors.

**Electronics Engineering Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Develops instrumentation and software for intelligent robotic sub-systems in the following areas: optical-electronic measurement and inspection systems; three-dimensional vision systems; optical filtering techniques; microprocessor systems; interface between measurement and control systems. Develops direct solar energy conversion in the following areas: development of photovoltaic power systems/devices; development of electronic power conversion and control equipment for photovoltaic applications; evaluation of the performance of photovoltaic modules. Also maintains and repairs the division's electronic instruments.

**Medical Engineering Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including exploratory and applied research into the interaction of non-ionizing radiation and low frequency current flows on the biological system, including ultrasound and 60Hz. Analyzing biological signals and processes as they apply to the clinical situation, for the disabled and its application in improving and increasing independence, vocational opportunities and quality of life. Design and development of guidance systems for the blind, communication devices for the severely handicapped, postural and locomotion aids.

**Power Engineering Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including research and development of current comparator and other techniques in the precise measurement of voltage, current, impedance, power and energy at direct and low frequency alternating currents. Measurement of corona phenomena on high voltage direct current transmission lines under various weather conditions for the prediction of corona losses, radio noise and audible noise from proposed long lines. Study of the mechanisms of aging of polymeric insulating materials for use in underground distribution cables. Study of the methods of measuring high voltage impulses and the requirements of impulse measuring systems to meet the required standards. Develops precision instrumentation for the electrical power industry and standards laboratories.

**Electron Physics Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Investigates the measurement, creation, processes, and application of ultra-high vacuum technology; studies surfaces with regard to their order, chemical and physical properties, utilizing beams of electrons, ions, molecules and photons; investigates quantum electronics and the physical processes controlling the operation of lasers; maintains and operates a liquid helium facility supplying liquid helium to internal and external users.

**Information Science Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Maintains and operates a computer network for comparative research in computer-aided design and manufacture and computer-aided training; develops terminals and software for specialized interactive computer applications; develops and operates a national authorizing language (NATAL) and supporting software for computer-aided learning; pursues information storage and retrieval activities with a focus on data base systems for CAD/CAM applications; studies computer-aided design with a focus on development of computer-based models to assist in the design/decision process; develops electronic data processing standards through measurement on government and Canadian Standards Association committees.

**Rehabilitation Technology Unit**

Montreal Road, Scarborough, Ontario M1W 3K5

Contact: Not Available.

Personnel: Data not available.

Activities: Assists Canadian industry in the production of aids which are in low demand but of substantial benefit to disabled persons; develops models and subsequent improvements of aids for production by small manufacturers; assists TASH Inc., a marketing agency of the aids, with technical support; contracts with manufacturers for development and/or initial production of new or improved aids; develops consumer product adaptations or accessories to aid disabled persons.

#### **Division of Energy**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: As listed below.

#### **Hydrogen and Energy Storage Program**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Coordinates and manages a national program related to the storage of energy, including the use of hydrogen as an energy carrier; in collaboration with industrial and other contractors, develops advanced systems for hydrogen production by electrolytic and other processes; studies appropriate systems for the transmission and storage of hydrogen, as hydrides and other high-pressure fluids; develops and evaluates systems for hydrogen utilization, including electrochemical systems (fuel cells) and mechanical systems (heat engines); develops and evaluates other energy storage systems, including electrochemical storage batteries and high-energy flywheels.

#### **Solar Energy Program**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Coordinates and manages a national program of research and development on the use of solar energy, including passive and photovoltaic as well as active thermal systems; guides and supports the generation of basic research and data collection related to utilization of solar energy in Canada; in collaboration with Canadian industry, develops components, products and systems for the economical harnessing of solar energy, and assists in the establishment of an indigenous solar energy industry; analyses, correlates and disseminates information on solar energy to government, industrial and user communities, informs appropriate users to their needs; contributes technically to the establishment of standards in the manufacture, installation and maintenance of solar equipment.

#### **Peat Energy Program**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Coordinates and manages a national peat research and development program, related to peat as energy stock; conducts in-house research to develop novel uses for peat; in cooperation with international agencies, develops standards for peat classification, terminology and test; contracts peat research through requests for proposals (RFPs) and unsolicited proposals (UPs); maintains the secretariat and related functions of the Canadian National Committee of the International Peat Society.

#### **Heat Pump Program**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Coordinates and manages the federal program on research and development on heat pumps, to exploit their energy conservation capabilities; evaluates the industrial applications of heat pumps for energy recovery energy cascading, drying, heating; develops and evaluates residential heat pump systems for space heating and cooling for domestic water heating, both stand-alone or with auxiliary sources; in collaboration with Canadian industry, develops systems components and equipment, including control systems, refrigerants, valves, condensers, evaporators, motor drive systems.

#### **Wind Energy Program**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Coordinates and manages federal government research and development in wind energy; compiles and interprets meteorological data to identify regional wind energy resources availability and other climatological factors affecting wind turbine performance and longevity; develops analytical and experimental methods for assessing of local topography and wind regimes at candidate turbine sites; assesses circumstances under which wind energy makes cost effective contributions to Canadian energy supplies; investigates fundamental aerodynamic and structural dynamic behavior of vertical-axis wind turbines; conducts laboratory and field trial experiments to verify performance and structural design techniques in collaboration with Canadian manufacturers and potential user agencies; establishes Canadian standards for safety, performance etc., for small wind energy conversion systems via the Canadian Standards Association.

#### **Fusion Energy Program**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Coordinates and manages a national program of research and development, towards a long-term inexhaustible energy option; in collaboration with Hydro-Quebec, operates the Canadian Centre for Magnetic Fusion, which has under construction a major national facility, the Tokamak de Varennes; in collaboration with Ontario Hydro and the Ontario Government, operates the Canadian Fuels Technology Project, which is a contracted-out program of research designed to establish Canada as a world leader in the technologies for management of tritium as a fusion fuel; coordinates a national program of research in inertial confinement fusion, focussed on high-power lasers and their interactions with plasmas; coordinates a program of international collaboration with the fusion programs of the USA, Japan, and the European Community.

**Bioenergy Program**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Coordinates and manages a national program of research and development in bioenergy; supports research into the fundamental problems associated with the conversion of wood (cellulose, hemicellulose, lignin) into enhanced forms of energy; develops improved technologies to allow complete mechanization of energy plantation systems including site preparation, planting, cultivation, harvesting, collection, pre-treatment and transportation; studies the extent and nature of the biomass to an appropriate form; provides technical advice to the federal government relative to national bioenergy policies and programs.

**Division of Mechanical Engineering**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: As listed below.

**Engine Laboratory**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Studies are formed on energy use in road vehicles including aerodynamics, traffic control strategies for urban areas, and diesel to natural gas fuel conversion, and in machinery for energy conversion including gas turbines and other industrial rotating machinery.

Facilities: Gas turbine engine; test cells; anechoic test cell; rotor dynamics facility.

**Gas Dynamics Laboratory**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Studies are performed on: flow of fluids at large flow rates including combustion, turbine and compressor aerodynamics and heat transfer; dynamics of fluids at high pressures such as high pressure water jets for industrial cutting purposes and plasma dynamics including basic experimental, theoretical and numerical studies of hot gases produced by magnetically-driven shock waves.

Facilities: Small aviation gas turbines; altitude test facilities; compressor test facility; industrial gas turbine compressor test facility; large flow rate compressor and exhaustic plants; wind tunnel for propulsion studies.

**Hydraulics Laboratory**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Work is performed on coastal engineering including physical processes of oceans and rivers, ice and wave mechanisms and simulation of sea states and on hydraulic energy such as the potential contained in oceans, rivers, currents and tides.

Facilities: Flumes; wave machines; and hydraulic test basins.

**Low Temperature Laboratory**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Research is conducted on energy conversion and conservation at low temperatures including heat pumps, solar energy and refrigeration equipment in northern environmental conditions; and on climatic effects on industrial equipment including icing effects.

**Manufacturing Technology Centre**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Research focusses on the application of computer technology including robotics to industrial manufacturing processes including flexible manufacturing systems which integrates a five-axis machining centre.

**Railway Laboratory**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Investigations are conducted on road and rail advanced vehicle concepts. The laboratory maintains and operates national facilities for rail vehicle research, testing and certification including a curved trench simulator, a vibration test stand, a squeeze frame and a high altitude test chamber.

**Systems Laboratory**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Research is conducted on industrial automation and ergonomics including man machine interfaces and sensor development and on computer modelling and simulation.

**Fuels and Lubricant Laboratory**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Research is performed on properties and application of engine fuels with emphasis on the road and rail mode and on test methods for petroleum products.

**Western Laboratory**

Montreal Road, Vancouver, British Columbia V6R 1P5

Contact: Not Available.

Personnel: Data not available.

Activities: The Laboratory is involved mainly with R and D for industry in the areas of tribology (friction, lubrication and wear); instrumentation and microprocessor development; the development of small-scale low cost mechanical equipment; and the industrial application of numerically controlled (NC) design and manufacturing methods.

**Division of Microstructural Sciences**

Montreal Road, Ottawa, Ontario K1A 0R5

Contact: Not Available.

Personnel: Data not available.

Activities: The Division of Microstructural Sciences has been established because of the long-term importance of microelectronics and parallel technologies such as microphotonics and micromechanics. The Division will be made up of existing personnel from the Physics and Electrical Engineering divisions of NRC.

**Division of Physics**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: The Division's research program includes - acoustics including outdoor noise propagation, external ear and acoustical standards - electrical and time standards - heat and thermometry including oceanographic and meteorological measurements - high energy physics including studies on interaction of nuclei in emulsions - laser and plasma physics including high power laser development, laser diagnostics and laser/plasma interactions - mechanical and optical physics including primary and secondary mass, length standards, laser frequency stabilization and measurement and optical coatings and filters - optics including: basic standards in radiometry, photometry and calorimetry; research on colour vision; performance and properties of optical and photographic materials; and measurement of solar radiation - photogrammetric research including new concepts and technology for photogrammetric instrumentation; development of methods and software for off-line and on-line analytical photogrammetry; research into factors limiting photogrammetric accuracy; research in digital image processing in photogrammetry; investigations into atmospheric refraction in photogrammetry and geodesy - solid state science including calorimetry and electronic structure of metals and alloys - X-rays and nuclear radiation including X-ray and Y-ray exposure standards, absorbed dose calorimetry, radiation transport and chemical dosimetry.

**Dominion Astrophysical Observatory**

5071 West Saanich Road, Victoria, British Columbia V8X 4M6

Contact: Not Available.

Personnel: Data not available.

Activities: Maintains and operates, both as a national facility and for in-house research, an optical observatory for studies of the structure and evolution of galaxies; globular and open star clusters; binary stars with special emphasis on x-ray sources; super nova remnants; design of astronomical instrumentation.

**Dominion Radio Astrophysical Observatory**

P.O. Box 248, Penticton, British Columbia V2A 6K4

Contact: Not Available.

Personnel: Data not available.

Activities: Maintains and operates both as a national facility and for in-house research on radio studies of the galaxy, super nova remnants, ionized hydrogen regions, pulsars, quasars and galaxies.

Facilities: 4-dish earth rotation synthesis telescope for neutral hydrogen spectroscopy and for continuum at 0.408 and 1.4 GHz; 25.6 # paraboloid with spectrometer and receivers for 0.408, 1.0, 1.4 and 2.7 GHz; long baseline interferometry; computing facilities; satellite terminal.

**Herzberg Institute of Astrophysics**

Sussex Drive, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: As listed below.

**Astronomy Unit**

Sussex Drive, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including continuum and special line studies using 46m radio telescope at the Algonquin Radio Observatory; time variations of Seyfert galaxies and quasars, and study of their structure and size by long baseline interferometry; intensity of 10cm radiation from the sun and high resolution observations with 10cm array. Optical studies of the solar photosphere and chromosphere.

**Planetary Sciences Unit**

Sussex Drive, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including studies of the ionosphere and auroral plasma by radio wave scattering techniques and rocket-borne probes; auroral spectroscopy and photometry; operates the Meteorite Observation and Recovery Project, a network of semi-automatic camera stations in the prairie provinces for determining the trajectories of bright meteors.

**Spectroscopy Unit**

Sussex Drive, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including high resolution studies of spectra of molecules, free radicals and ions in microwave, infrared, visible, ultraviolet and vacuum ultraviolet regions. Interpretations for spectra of astrophysical interest, studies the effects of electric and magnetic fields on molecular spectra, develops spectroscopic techniques.

**Space Physics Unit**

Sussex Drive, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including studies of plasmas and fields in earth's magnetosphere and high latitude ionosphere using rockets and satellites. Studies of solar and galactic cosmic rays using ground-based and spacecraft instrumentation. Operates a network of cosmic ray monitors with stations at Ottawa, Deep River, Goose Bay, Inuvik, and Alberta.

**Industrial Materials Research Institute**

75 De Montagne Boulevard, Boucherville, Québec J4B 6Y4

Contact: Not Available.

Personnel: Data not available.

Activities: This institute is carrying out industrially-relevant research on materials such as glass, ceramics, concrete and plastics. Research ranges from laboratory-scale experiments to pilot plant-scale projects.

**Industry Development Office**

Sydney/Halifax, Nova Scotia B1X 1X1

Contact: Not Available.

Personnel: Data not available.

Activities: Not available

**Institute for Marine Dynamics: St. John's**

St. John's, Newfoundland A0X 1X1

Contact: Not Available.

Personnel: Data not available.

Activities: NRC is currently establishing a marine engineering facility on the campus of Memorial University of Newfoundland at St. John's, in support of Canada's Oceans Policy for achieving an internationally recognized excellence in operating on or below ice-covered waters. The Centre will promote and assist in the development and construction of vessels and fixed structures, and will provide NRC and Canada with an integrated, world class centre of excellence in marine and ice dynamics.

**Institute for Marine Dynamics: Ottawa**

Montreal Road, Building M-22, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Not available

**Institute for Optics**

Quebec City, Quebec G1X 1X1

Contact: Not Available.

Personnel: Data not available.

Activities: Designed to support the Canadian optics industry by technology development and transfer, by training skilled personnel and by creating core expertise in areas of potential industrial benefit. It will also provide an optical-design service to industry and a testing laboratory to assess the quality of optical components and systems.

**National Aeronautical Establishment**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: As listed below.

**Low Speed Aerodynamics Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including wind tunnel tests on aircraft, buildings, bridges, and other structures; wind energy conversion, fluid flow instrumentation, wake vortices and wing-body interactions and aerodynamics of wind turbines.



**High Speed Aerodynamics Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including wings and bodies in transonic flow; high-lift systems; viscous flows; buffet and flutter; and computational fluid dynamics. Conducts commercial aerodynamic investigations for aerospace industries and agencies.

**Unsteady Aerodynamics Unit**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Including oscillatory and rotary experiments; validity of equations for aircraft dynamics; techniques for trace vapour detection (i.e. from hazardous chemicals and illicit materials); and effects of meteorological conditions on pesticide spray applications; plus operates a fleet of 10 research aircraft; flight research including aircraft flight systems, flight mechanics, atmospheric studies, aircraft operational problems, navigation and guidance systems, agricultural and forestry aviation and aeromagnetism. This group provides assistance to the aerospace community in Canada in matters relating to design, fabrication and structural integrity of aircraft and space structures. In addition, the Establishment maintains a Teleoperator Project Office which is responsible for the management of the Space Shuttle Remote Manipulator System (CANDARM) and for other related systems. The Establishment also provides a focal point for all law enforcement projects carried out by the NRC for the RCMP as lead agency including laser fingerprint enhancement, radio spectrum space allocation, narcotics detection and evaluation of police equipment.

**Plant Biotechnology Institute**

110 Gymnasium Road, University Campus, Saskatoon, Saskatchewan S7N 0W9

Contact: Not Available.

Personnel: Data not available.

Activities: The Institute does research in plant-related industrial, forest, and agricultural biotechnology. It is primarily concerned with plants: the means in which they process molecules at the cellular level; how cells can be modified to generate substances of value, how crops can be utilized to optimize their value as food and animal feedstocks; ways of cultivating plant cells are studied, the production of disease free clones and the preservation of cells through continued freezing. Work with plants also includes photosynthesis, nitrogen fixation, and fungal degradation of forest products.

Facilities: The laboratory is equipped with greenhouses, environmental cabinets and environmental growth rooms for plants; chemical analytical equipment including gas and high-pressure liquid chromatographs, mass spectrometers, nuclear magnetic resonance instruments, other spectrometers - all computer-assisted; laboratory pilot scale units for crop processing and fermentation operations; in-house library, machine shop and data processing services; much other biochemical and biological equipment including facilities for summer field operations.

**Technical Information Service: Winnipeg**

1329 Niakwa Road, Winnipeg, Manitoba R2J 3T4

Contact: Not Available.

Personnel: Data not available.

Activities: Part of NRC's Field Advisory Service (see Industry Development Office - PAGE 52).

**Technical Information Service: Ste-Foy**

333 Franquet Street, P.O. Box 9038, Ste-Foy, Québec G1P 4C7

Contact: Not Available.

Personnel: Data not available.

Activities: Part of NRC's Field Advisory Service (see Industry Development Office - PAGE 52).

**Technical Information Service: St. John's**

44 Torbay Road, St. John's, Newfoundland A1A 2G4

Contact: Not Available.

Personnel: Data not available.

Activities: Part of NRC's Field Advisory Service (see Industry Development Office - PAGE 52).

**Technical Information Service: Charlottetown**

73 Rochford Street, Charlottetown, Prince Edward Island C1A 3T5

Contact: Not Available.

Personnel: Data not available.

Activities: Part of NRC's Field Advisory Service (see Industry Development Office - PAGE 52).

**Technical Information Service: Toronto**

789 Don Mills Road, Toronto, Ontario M3C 1T5

Contact: Not Available.

Personnel: Data not available.

Activities: Part of NRC's Field Advisory Service (see Industry Development Office - PAGE 52).

## **PUBLIC WORKS CANADA**

### **Design and Construction Division**

Riverside Drive, Ottawa, Ontario K1A 0M2

Contact: Not Available.

Personnel: Total is 1361.

Activities: Not available

## **TRANSPORT CANADA**

### **Air Transportation - Research Experimentation Centre**

Government Printing Bureau, Hull, Québec J8X 1C6

Contact: Not Available.

Personnel: Data not available.

Activities: Not available

### **Hydraulics Research Centre**

Lasalle, Québec G1X 1X1

Contact: R. Gagne-Schryer, Finance and Administration, Tel: (613) 996-7119

Personnel: Total is 8.

Activities: The Canadian Coast Guard's Hydraulics Research Centre is utilized by research engineers to conduct in-house studies in establishing safe and efficient channel conditions for navigation in Canadian waterways. Investigations are conducted on scale models simulating the site and vessel conditions to be studied. In general, these studies are oriented by the departments regulatory and operational responsibilities, and they relate to existing conditions or proposed developments. Some of the research programs in progress or being planned are: the investigation of methods of protecting bridge piers in navigable waters; study of buoy mooring forces; determination of loss of speed/power of vessels navigating in ice-infested waterways; and testing of large vessel manoeuvrings in restricted waterways.

### **Motor Vehicle Test Centre**

P.O. Box 285, Blainville, Québec J7E 4J2

Contact: Not Available.

Personnel: Total is 36.

Activities: Maintains physical facilities and provides some motor vehicle testing services for the Road Safety and Motor Vehicle Regulation Directorate of Transport Canada, and for other public and private sector clients.

### **Navigational Aids Test Establishment**

Cardinal, Ontario K0E 1X1

Contact: R. Gagne-Schryer, Finance and Administration, Tel: (613) 996-7119

Personnel: Total is 3.

Activities: A new Navigational Aids Test Establishment was constructed and officially opened on a ten acre site 90km south of Ottawa, at Cardinal, Ontario. The new buildings contain workshops and laboratories where the full range of conventional aids and associated equipment can be developmentally and qualificationally tested. Open air test pads around the main buildings have been arranged for the testing of externally mounted equipment and complete power packages. NATE was previously located at Prescott, Ontario.

## **FUNDING ESTABLISHMENTS**

**NOTE: Personnel shown for the funding establishments refer to personnel engaged in the administration of extramural programs.**

## CANADIAN DAIRY COMMISSION

2197 Riverside Drive, Ottawa, Ontario K1A 0Z2

Contact: Denis Renaud, Director Domestic Marketing, Tel: (613) 998-9490

Personnel: Total is 2.

Activities: Give contractual research to Canadian Industries and Universities in order to increase the consumption and utilization of dairy products.

## CANADIAN INTERNATIONAL DEVELOPMENT AGENCY

Place du Centre, 200 Promenade du Portage, Hull, Québec K1A 0G4

Contact: D.R. Warner, Planning Support Officer, Tel: (819) 994-4026

Personnel: Total is 16.

Activities: The objective of CIDA is to facilitate the efforts of the peoples of developing countries to achieve self-sustainable economic and social development in accordance with their needs and environment, by co-operating with them in development activities; and to provide humanitarian assistance thereby contributing to Canada's political and economic interest abroad in promoting social justice, international stability and long-term economic relationships, for the benefit of the global community.

## DEPARTMENT OF REGIONAL INDUSTRIAL EXPANSION

235 Queen Street, Ottawa, Ontario K1A 0H5

Contact: Not Available.

Personnel: Data not available.

Activities: Not available

## EXTERNAL AFFAIRS CANADA

### Grains and Oilseeds Program

235 Queen Street, Ottawa, Ontario K1A 0G2

Contact: Not Available.

Personnel: Total is 1.

Activities: **MARKETING:** Study and development of more effective and economic methods for moving, storing, processing and selling Canadian grains and oilseeds; development and administration of programs for preparing production guidelines; establishment of initial payments for Canadian Wheat Board grains; provision of marketing and industrial development assistance; and participation in the work of international and domestic organizations concerning grains and oilseeds, the operation of the office of the Minister of State for the Canadian Wheat Board and the special group on grains. **GRAINS PAYMENTS:** Payments to the Canadian Wheat Board of interest on cash advances on farm stored grain made to producers in Western Canada; reimbursement to the Canadian Wheat Board when grain producers default on repayment of cash advances, under terms of the Prairie Grain Advance Payments Act; reimbursements to the Canadian Wheat Board where necessary under the terms of the Canadian Wheat Board Act for deficits incurred on the Canadian Wheat Board pool accounts, and payments in connection with the Western Grain Stabilization Act.

## INTERNATIONAL DEVELOPMENT RESEARCH CENTRE

60 Queen Street, Ottawa, Ontario K1G 3H9

Contact: Not Available.

Personnel: Total is 85.

Activities: To initiate, encourage, support and conduct research into the problems of the developing regions of the world and into the means of applying and adapting scientific, technical and other knowledge to the economic and social advancement of those regions. **DEVELOPMENT RESEARCH:** Support for research in agriculture, food and nutrition, in health, in social sciences, in information research, as well as support for a program aimed at the development of human resources. **RESEARCH RELATED ACTIVITIES:** Activities designed to identify and develop research projects, to disseminate research findings and support the research library of the Centre. **COOPERATIVE PROGRAMS:** Support for joint research activities between Canadian and Third World institutions in areas where Canada has research and development expertise.

## MEDICAL RESEARCH COUNCIL OF CANADA

20th Floor, Jeanne Mance Building, Tunney's Pasture, Ottawa, Ontario K1A 0W9

Contact: Mr. Guy D'Aloisio, Chief, Financial Services, Tel: (613) 593-7865

Personnel: Total is 51.

Activities: The Council's objective is to promote and assist basic, applied, and clinical research in the health sciences and to support the training and development of research manpower, with the intention of helping to attain the quality and scale of research essential to the maintenance and improvement of health services. Having no laboratories of its own, the Council seeks to fulfill its mandate through the support of health science research and research training carried out primarily in faculties of medicine, dentistry, pharmacy, nursing, and veterinary medicine and their affiliated hospitals and institutes across Canada. Through its grants-in-aid program, funds for the direct costs of research are provided for research projects, the purchase of major equipment, and the operation and maintenance of shared facilities. Special programs have been designed for the support of collaborative and interdisciplinary research, for the stimulation of research in particular fields or in the application of biotechnology, and for the development of a more adequate research base in designated faculties. Through its manpower support programs, salary support is provided for a limited number of outstanding independent academic investigators, and for a limited number of highly qualified candidates undertaking full-time research training at the undergraduate level (summer students), at the predoctoral level (graduate students), or after having obtained an M.D., D.D.S., D.V.M., Pharm.D., or Ph.D. degree (postdoctoral fellows). Other programs afford opportunities for collaboration and exchange of information between Canadian scientists and their colleagues in Canada and abroad, and support the costs of workshops and symposia designed to address specific questions of importance to research in the health sciences in Canada and to reach a consensus on recommendations or conclusions.

## NATIONAL RESEARCH COUNCIL CANADA

### Industry Development Office

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Total is 152.

Activities: This office is responsible for managing NRC's industrial assistance programs: Program for Industry/Laboratory Projects (PILP) and the Industrial Research Assistance Program (IRAP). It also performs industrial policy reviews and analyses to aid the office and NRC as a whole on industrial policy issues. The PILP program offers Canadian industry the scientific know-how of research laboratories at the National Research Council and other science-based government departments. Technical assistance by government experts involves consultation, delivery of research data, training of company personnel, collaborative research or access to government laboratory facilities. One of the prerequisites for PILP support is that the Canadian company has sufficient technical and business capability to commercialize the results of suitable projects. The government's financial assistance is determined on a negotiated cost-sharing basis. PILP will also contribute towards the cost of visiting various laboratories when the companies are located at some distance from the laboratories. The IRAP program encourages firms to undertake R&D leading to furthering the economic development of Canada. Through IRAP, the scientific and R&D management resources of federal government and other laboratories are brought to the support of industry. IRAP projects and activities assist firms of all sizes to tackle their technical problems and challenges. The IRAP program consists of six elements: IRAP-C: Field Advisory Service; IRAP-F: Technical Information Service; IRAP-H: Contributions to Firms Employing Undergraduates; IRAP-L: Contributions to Laboratory Investigations; IRAP-M: Contributions to Small Projects; IRAP-P: Contributions to Large Projects.

## NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL OF CANADA

200 Kent Street, Ottawa, Ontario K1A 1H5

Contact: Ken Mintha, Head, Accounting Operations, Tel: (613) 995-5731

Personnel: Total is 111.

Activities: To promote and support the development and maintenance of research and the provision of highly qualified manpower in the natural sciences and engineering.

## **ADMINISTRATIVE ESTABLISHMENTS**





## **AGRICULTURE CANADA**

### **Administrative Office: Ontario Region**

K.W. Neatby Building, Carling Avenue, Ottawa, Ontario K1A 0C6

Contact: Dr. J.J. Cartier, Director General, Tel: (613) 995-3104

Personnel: Total is 17.

Activities: This is the central administrative office for the Ontario Region and provides direction for research in response to regional needs, and to the challenge of the agri-food strategy and the Department, as outlined by the Deputy Minister and the Assistant Deputy Minister (Research).

### **Administrative Office: Pacific Region**

Room 550, Centennial Building, 750 Cambie Street, Vancouver, British Columbia V6B 4T5

Contact: Dr. S.C. Thompson, Director General, Tel: (604) 666-8164

Personnel: Total is 1.

Activities: This is the central administrative office for the Pacific Region and provides direction for research in response to regional needs, and to the challenges of the agri-food strategy and the Department, as outlined by the Deputy Minister and the Assistant Deputy Minister (Research).

### **Administrative Office: Prairie Region**

Room 401, 1955 Smith Street, Regina, Saskatchewan S4P 2N8

Contact: Dr. W.L. Pelton, Director General, Tel: (306) 665-5083

Personnel: Total is 18.

Activities: This is the central administrative office for the prairie region and provides direction for research in response to regional needs, and to the challenges of the agri-food strategy and the Department, as outlined by the Deputy Minister and the Assistant Deputy Minister (Research).

### **Administrative Office: Québec Region**

Guy Favreau Complex - Ste. 1002-R, East Tower, 200 Dorchester Street West, Montréal, Québec H2Z 1Y3

Contact: Mr. J.J. Jasmin, Director General, Tel: (514) 285-8888

Personnel: Total is 8.

Activities: This is the central administrative office for the Quebec Region and provides direction for research in response to regional needs, and to the Department as outlined by the Deputy Minister and the Assistant Deputy Minister (Research).

### **Atlantic Region**

1888 Brunswick Street, Suite 512, Halifax, Nova Scotia B3J 3J8

Contact: Dr. E.E. Lister, Director General, Tel: (902) 426-7111

Personnel: Total is 8.

Activities: This is the central administrative office for the Atlantic Region and provides direction for research in response to regional needs, and to the challenges of the agri-food strategy and the Department as outlined by the Deputy Minister and the Assistant Deputy Minister (Research).

### **Canadian Forestry Service - Canadian Forestry Administration Service - Headquarters**

351 boulevard St-Joseph, Hull, Québec K1A 1G5

Contact: Jean Duguay, Financial Agent, Tel: (613) 997-1107

Personnel: Total is 96.

Activities: To plan, direct and coordinate the research and development programs and technical services of the C.F.S.; to manage the person-year and financial resources of the Research and Technical Services Directorate.

### **Institute Headquarters**

K.W. Neatby Building, Carling Avenue, Ottawa, Ontario K1A 0C6

Contact: Dr. J.W. Morrison, Director General, Tel: (613) 996-6108

Personnel: Total is 4.

Activities: This office is responsible for administration of the research programs of the Institutes which are centres of scientific expertise oriented to national needs. Institutes objectives are formulated in response to the challenges of the agri-food strategy and the Department as outlined by the Deputy Minister and the Assistant Deputy Minister (Research).

### **Libraries Division**

Sir John Carling Building, Ottawa, Ontario K1A 0C5

Contact: Louise Gallant, Branch Financial Manager - Administration, Tel: (613) 995-5118

Personnel: Total is 94.

Activities: Management and Administration - Offices of the Minister, Deputy Minister and Central Support Services including administration, data processing, finance, internal audit, personnel, management services and libraries.

### **Research Branch Headquarters**

930 Carling Avenue, Ottawa, Ontario K1A 0C5

Contact: Dr. R.L. Halstead, Director General, Tel: (613) 995-7084

Personnel: Total is 49.

Activities: The Research Branch Headquarters in Ottawa comprises the offices of the Assistant Deputy Minister Research, the Program Coordination Directorate and the Administration Division, and carries the responsibility for formulation and implementation and the Research Branch Strategies and operational plans.

#### **Research Program Service**

K.W. Neatby Building, Carling Avenue, Ottawa, Ontario K1A 0C6

Contact: Mrs. E. Larmond, Acting Director, Tel: (613) 995-3118

Personnel: Total is 44.

Activities: Research Program Service supports research and development in the Branch by maintaining computerized scientific and technical information systems, providing publication services, and administering Branch awards and international scientific exchange programs. The Service is divided into four sections: Administration, which contains the Awards, Branch liaison, and Text/Word Processing units; Graphics, which contains the Art and Design and the Photography units; Scientific Editing, which contains the English and French editing units; and Scientific Information retrieval, which contains the Biocontrol, Systems, Pesticides, and Inventory units.

#### **Systems and Consulting Directory**

Sir John Carling Building, Ottawa, Ontario K1A 0C5

Contact: Louise Gallant, Branch Financial Manager - Administration, Tel: (613) 995-5118

Personnel: Total is 138.

Activities: Management and Administration - Offices of the Minister, Deputy Minister and Central Support Services including administration, data processing, finance, internal audit, personnel, management services and libraries.

### **CANADA MORTGAGE AND HOUSING CORPORATION**

Montreal Road, Ottawa, Ontario K1A 0P7

Contact: W. Campbell, Senior Financial Analyst, Tel: (613) 748-2410

Personnel: Total is 51.

Activities: The Corporation plans, manages and undertakes empirical social, economic and technical research, which is directed at understanding the conditions and relationships affecting the supply of, and demand for housing in Canada; its quality and affordability. This may include leading or participating in interdepartmental and intergovernmental research efforts. In technical and engineering fields such as for example, that concerning energy conservation and its consequences in the housing stock are examined. Further investigations are undertaken to field test and assess unproven housing technology.

### **DEPARTMENT OF COMMUNICATIONS**

#### **Communications - Headquarters**

Journal Tower, North Building, Ottawa, Ontario K2H 8S5

Contact: Daryl Leitch, Financial Analyst, Tel: (613) 990-4665

Personnel: Total is 338.

Activities: Not available

### **ENERGY, MINES AND RESOURCES CANADA**

#### **Conservation and Non-Petroleum Sector**

460 O'Connor Street, Ottawa, Ontario K1S 5H3

Contact: Linda Biard, Assistant Controller, CAE, Tel: (613) 995-9447

Personnel: Total is 1483.

Activities: This sector of EMR is concerned with federal conservation, oil substitution and renewable energy initiatives in each of the major energy-using sectors.

#### **Geophysical Observatory: Alert**

Alert, Northwest Territories X0A 1X1

Contact: R.L. Coles, Head, Networks & Data Control, Tel: (613) 995-5487

Personnel: Total is 1.

Activities: This observatory contains a station in the Canadian standard seismograph network and a station in the Canadian Magnetic Observatory Network.

Facilities: Photographic and electronic recording equipment.

**Geophysical Observatory: Flin Flon**

Flin Flon, Manitoba R8A 1X1

Contact: R.L. Coles, Head, Networks & Data Control, Tel: (613) 995-5487

Personnel: Total is 1.

Activities: Monitoring seismic ground motion. Flin Flon is a station in the Canadian Standard Seismograph Network.

Facilities: Photographic recording seismographs.

**Geophysical Observatory: Mould Bay**

Mould Bay, Northwest Territories X0A 1X1

Contact: R.L. Coles, Head, Networks & Data Control, Tel: (613) 995-5487

Personnel: Total is 1.

Activities: This observatory comprises a station in the Canadian Standard Seismograph Network and a station in the Canadian Magnetic Observatory Network.

Facilities: Photographic and electrical recording equipment.

**Geophysical Observatory: Priddis**

P.O. Box 57, Midnapore, Alberta T0L 1J0

Contact: J. Popelar, Tel: (613) 995-5302

Personnel: Total is 2.

Activities: Monitoring of the earth's rotational dynamics and the stability of a primary reference and calibration point for astronomical and satellite observations. The observatory contributes data daily to the international time and polar motion services and assures precise orbit determination for navigational, geodetic and geophysical satellites over Western Canada.

Facilities: Photographic Zenith Tube (PZT), TRANET Satellite Tracking Station, HP-1000 Mini-computer and Data communication equipment.

**Geophysical Observatory: Resolute Bay**

Resolute Bay, Northwest Territories X0A 1X1

Contact: R.L. Coles, Head, Networks & Data Control, Tel: (613) 995-5487

Personnel: Data not available.

Activities: This observatory contains a station in the Canadian Regional Seismograph Network and a station in the Canadian Magnetic Observatory Network.

Facilities: Electronic recording equipment.

**Geophysical Observatory: Yellowknife**

Yellowknife, Northwest Territories X1A 1X1

Contact: R.B. Hayman, Head, Geophysical Instrumentation, Tel: (403) 837-4241

Personnel: Total is 3.

Activities: This observatory contains a station in the Canadian Standard Seismograph Network and a station in the Canadian Magnetic Observatory Network. The Observatory also operates the Yellowknife array of seismometers which is used in monitoring nuclear explosions.

Facilities: Electronic and photographic recording equipment.

**Seismological Observatory: Penticton**

Penticton, British Columbia V2A 1X1

Contact: R.L. Coles, Head, Networks & Data Control, Tel: (613) 995-5487

Personnel: Total is 1.

Activities: This is a station in the Canadian Standard Seismograph Network.

Facilities: Photographic recording seismographs.

**ENVIRONMENT CANADA****Canadian Wildlife Service**

1141 Church Street, Ste-Foy, Québec G1V 4H5

Contact: Charles A. Drolet, Regional Director, Tel: (514) 694-3914

Personnel: Data not available.

Activities: Not available

**Fort Lennox**

St-Paul de l'île aux noix, Québec J0J 1G0

Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092

Personnel: Data not available.

Activities: Not available

**Fortress of Louisbourg**

P.O. Box 160, Louisbourg, Nova Scotia B0A 1M0  
Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092  
Personnel: Data not available.  
Activities: Not available

**Halifax Defence Complex - Area Office**

P.O. Box 1480, Halifax, Nova Scotia B3K 5B7  
Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092  
Personnel: Data not available.  
Activities: Not available

**Historic Parks National Resources**

10 Wellington Street, Hull, Québec K1A 3G2  
Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092  
Personnel: Data not available.  
Activities: Not available

**Inland Waters Directorate - Québec Region**

1141 Church Street P.O. 10100, Ste-Foy, Québec G1V 4H5  
Contact: Claude Triquet, Regional Director, Tel: (514) 694-4921  
Personnel: Data not available.  
Activities: Management of waters of national and international interest, by agreement with the province, management of waters under provincial jurisdiction where the national interest is affected, in the Québec region.

**Klondike Historic Site**

P.O. Box 390, Dawson City, Yukon Y0B 1G0  
Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092  
Personnel: Data not available.  
Activities: Not available

**Lachine Canal**

244 St-Jérôme, Montréal, Québec H2Y 1L9  
Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092  
Personnel: Data not available.  
Activities: Not available

**Management and Administration Branch - Rare and Endangered Species**

Canadian Wildlife Service, Ottawa, Ontario K1A 0E7  
Contact: Mr. J. Heppes, Section Head, Tel: (819) 997-1840  
Personnel: Data not available.  
Activities: Administration and regulation of International Trade in endangered species of live animals and plants as well as their respective parts and derivatives.

**Parks Canada - Office of the Director General**

10 Wellington Street, Hull, Québec K1A 3G2  
Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092  
Personnel: Data not available.  
Activities: Not available

**Parks Canada - Program Planning and Analysis: Winnipeg**

391 York Avenue, Winnipeg, Manitoba R3C 4B7  
Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092  
Personnel: Data not available.  
Activities: Not available

**Parks Canada - Program Planning and Analysis: Hull**

10 Wellington Street, Hull, Québec K1A 3G2  
Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092  
Personnel: Data not available.  
Activities: Not available

**Parks Canada - Program Planning and Analysis: Calgary**

220-4th Avenue. S.E., Calgary, Alberta T2P 3H8  
Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092  
Personnel: Data not available.  
Activities: Not available

**Parks Canada - Program Planning and Analysis: Cornwall**

111 Water Street, Cornwall, Ontario K6H 5F3

Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092

Personnel: Data not available.

Activities: Not available

**Program Management: Québec Region**

3 Buade Street, Haute-Ville, Québec G1R 4U7

Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092

Personnel: Data not available.

Activities: Not available

**Québec Regional Office: Fort Coteau-du-Lac**

C.P. 211, Coteau-du-Lac, Québec G0P 1B0

Contact: H. Blackburn, Financial Analyst, Tel: (613) 994-5092

Personnel: Data not available.

Activities: Not available

**System and Informatics Directorate**

Place Vincent Massey Building, 5th Floor, Ottawa, Ontario K1A 1C7

Contact: A.W. Douglas, Director, Application Software and Quantitative Methods, Tel: (613) 997-8810

Personnel: Total is 64.

Activities: The Directorate provides advice and assistance to any organization of the Department in the areas of applied mathematical statistics and other quantitative methods. As well, it provides service in scientific computing and in the development, maintenance, data entry and production aspects of scientific computer-based information systems.

Facilities: In-house DG MV1000 and DG MV4000 computers, Olivetti M24 and IBM PC microcomputers. Access to variety of computing equipment externally.

**Wildlife Research Branch - Canadian Council on Ecological Areas**

Canadian Wildlife Service, Ottawa, Ontario K1A 0E7

Contact: Mr. R.D. Muir, Secretary of CCEA, Tel: (819) 997-4991

Personnel: Data not available.

Activities: Encourages and promotes legislated protection of a national system of ecological areas and reserves, as the successor of the Associate Committee on Ecological Reserves. Formerly residing in N.R.C.

**Wildlife Research Branch - Information and Communications Section**

Canadian Wildlife Service, Ottawa, Ontario K1A 0E7

Contact: Mr. R.A. Desjardins, Chief, Management & Administration Branch, Tel: (819) 997-1245

Personnel: Data not available.

Activities: Preparation and printing of reports, etc., pertaining to wildlife research. Maintaining and distribution of data and obtaining technical and research reports necessary to operations.

**Wildlife Research Branch - Rare and Endangered Species**

Canadian Wildlife Service, Ottawa, Ontario K1A 0E7

Contact: Mr. R.D. Muir, Secretary of COSEWIC, Tel: (819) 997-4991

Personnel: Data not available.

Activities: Assigning status to endangered species for agencies within Canada.

**FISHERIES AND OCEANS**

**Fisheries Research Directorate**

200 Kent Street, 12th Floor, Ottawa, Ontario K1A 0E6

Contact: Mr. J. Beckett, Research Director, Tel: (613) 990-0269

Personnel: Total is 22.

Activities: The Fisheries Research Directorate performs various research-related coordinating, advisory, and communicating functions at the National level, including coordination of the planning process for fisheries research and of the transfer of technology to the private sector, and directing the National Registry of fish diseases. This Directorate also has national responsibility for providing advice and support to the Departmental Senior Management on issues relating to fisheries research programs and the scientific aspects of resource management policy and programs; and for providing fisheries research-related information to departments, agencies and individuals outside the Department of Fisheries and Oceans.

**HEALTH AND WELFARE CANADA**

**Health Services and Promotion Branch**

Jeanne Mance Building, Ottawa, Ontario K1A 1B4

Contact: D. Cadieux, Financial Planning Officer, Tel: (613) 990-7978

Personnel: Total is 279.

Activities: The Health Services and Promotion Branch of the Health and Social Services Program (NHW), primarily administers scientific activities carried out extramurally. It supports studies, research, demonstration projects and special health care projects, and provides fellowships for research training and support for a limited number of career scientists, all in the areas of enquiry related to the department's responsibilities.

#### **Program Administration**

Brooke Claxton Building, Colombine Boulevard, Ottawa, Ontario K1A 0L2

Contact: D.F. MacDonald, Head, Budgets and Financial Analysis, Tel: (613) 993-7696

Personnel: Total is 227.

Activities: Provides scientific support to operating directorates specifically Animal Resources, Library and Visual Communications

### **INDIAN AND NORTHERN AFFAIRS CANADA**

#### **Analysis - Nanisivik**

Yellowknife, Northwest Territories X1A 1X1

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Data not available.

Activities: A study was initiated in 1979 to determine the concentrations of lead, zinc and cadmium in sediment and marine biota near Nanisivik. A similar study was initiated in the vicinity of Polaris in 1981. The work was conducted by DFO and partially funded by NAP NWT Region. Funding in 1983/84 was in payment for analysis, data reductions and preparation for samples collected in 1981 at both Polaris and Nanisivik.

#### **Flood Damage Reduction Program**

Yellowknife, Northwest Territories X1A 1X1

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Data not available.

Activities: N.W.T. version of national program to reduce flood damages by mapping and restricting further development in flood prone areas.

#### **Hydrometric Agreement**

Yellowknife, Northwest Territories X1A 1X1

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Total is 0.

Activities: An agreement with DOE for collection of hydrometric data in the NWT - DIAND is responsible for funding stations required to monitor development activities.

#### **Hydrometric Station - Snare River**

Yellowknife, Northwest Territories X1A 1X1

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Data not available.

Activities: Capital funding for purchase of hydrometric instrumentation on Snare River provided to DOE, through IANC, by NCPC. Station records to be used in flow forecasting model for NCPC's Snare hydroelectric generating system.

#### **Monitoring - Beaufort Sea (EPS)**

Yellowknife, Northwest Territories X1A 1X1

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Data not available.

Activities: Arctic Marine Methods Manual: 1983: 10k. The funds were spent on a joint interdepartmental project design to produce a reference manual for the standardization of general sediment analysis. This contract is extended over a two (2) year period and NAP/INAC contribution will be of 10k in 1984.

#### **Northern Environmental Protection Directorate**

10 Wellington Street, Hull, Québec K1A 0H4

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Total is 15.

Activities: The Directorate with headquarters in the National Capital Region co-ordinates, develops and recommends policies, strategies, plans and regulations for environmental protection in Yukon and NWT and in adjacent off-shore regions. It manages an applied northern environmental research program and sponsors other applied research to support this role. The Directorate also develops and implements policies concerning environmental impact assessment of northern development projects, and is responsible for the implementation of the Federal Environmental Assessment and Review Process within the Northern Program.

**Northern Hydrotechnical Study**

Yellowknife, Northwest Territories X1A 1X1

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Data not available.

Activities: Reduction of hydrometric data collected at highway stream crossings along southern N.W.T. highways from 1978 to 1983, for the purpose of highway design evaluations.

**Northwest Territories Climate Program**

Yellowknife, Northwest Territories X1A 1X1

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Data not available.

Activities: Program to collect air temperature and precipitation data in smaller representative gauged watersheds across the N.W.T., in order to document watershed response to snowmelt and precipitation.

**Toxicology Study of Thiocynide**

Yellowknife, Northwest Territories X1A 1X1

Contact: Ron Lahaie, Financial Officer, Tel: (613) 997-9344

Personnel: Data not available.

Activities: Toxicity of thiocyanate to rainbow trout as a function of temperature, ph and hardness. A study to determine the toxicity of thiocyanate to rainbow trout at different ph's, temperature by the region through the ALUR program. Work was conducted by the Centre de recherche Noranda. Funding of 7.5k was provided by NAP-NWT Region to permit start up in the fiscal year 1983/84. Balance of funding will be provided through the ALUR Program.

**INTERNATIONAL JOINT COMMISSION****Canadian Secretariat**

100 Metcalfe Street, Ottawa, Ontario K1P 5M1

Contact: Peter Meloche, Financial Services Officer, Tel: (613) 992-1795

Personnel: Total is 23.

Activities: Payment of Canada's Share of Joint Studies, Surveys and Investigations under International References - Co-ordination of the work in international investigating boards; supervision of international boards of control established by the Commission; and payment of residual expenditures for surveys and investigations.

**Great Lakes Regional Office**

100 Ouellette Avenue, Windsor, Ontario N9A 6T3

Contact: Peter Meloche, Financial Services Officer, Tel: (613) 992-1795

Personnel: Total is 23.

Activities: Responsibilities under the Canada-United States Agreement on Great Lakes Water Quality - Surveillance monitoring, co-ordination and assistance to the Governments in implementation of the Agreement, operation of the Regional Office under cost-sharing arrangements with the United States, and furnishing support to the Great Lakes Water Quality Board and the Science Advisory Board.

**NATIONAL DEFENCE****Chief Research and Development Headquarters**

Ottawa, Ontario K1A 0K2

Contact: Director, Tel: (613) 992-8440

Personnel: Total is 117.

Activities: CRAD HQ is responsible for the overall conduct of the R&D Program. It is responsible for ensuring that knowledge of actual and anticipated advances in science and technology is available to support Departmental decisions in scientific and engineering applications. It provides an interface between defence R&D activities and the rest of the NDHQ and the Canadian Forces.

**NATIONAL ENERGY BOARD**

473 Albert Street, Ottawa, Ontario K1A 0E5

Contact: Benoit Petrin, Chief, Budgets and Estimates, Tel: (613) 995-6557

Personnel: Total is 460.

Activities: Energy Regulation and Advice - Economic and market analysis; financial analysis of pipeline companies; engineering analysis of pipeline and power line construction proposals; certification of construction and operation of pipelines and power lines subject to federal jurisdiction; regulation of tolls and tariffs; safety inspection of pipelines; conduct of public hearings; and administration services to the Board.

## **NATIONAL RESEARCH COUNCIL CANADA**

### **Meteorite Observation and Recovery Project - Herzberg Institute of Astrophysics**

Saskatoon, Saskatchewan S7N 0W0

Contact: Not Available.

Personnel: Data not available.

Activities: Not available

Facilities: A system of 12 semi-automatic camera tracking stations distributed across the Prairie Provinces.

### **Office of the Atlantic Regional Director**

1411 Oxford Street, Halifax, Nova Scotia B3H 3Z1

Contact: Not Available.

Personnel: Data not available.

Activities: In April 1981, NRC established an Atlantic Regional Office and appointed an Atlantic Regional Director to coordinate NRC activities in the Atlantic Provinces and, where appropriate, to ensure a focussing of NRC programs on the opportunities and needs of the region. An Atlantic Advisory Committee has also been established to assist in formulating a total NRC program applicable to Atlantic Canada.

### **Personnel and Administrative Services**

Montreal Road, Ottawa, Ontario K1A 0R6

Contact: Not Available.

Personnel: Data not available.

Activities: Provides administrative support including executive officers for NRC's laboratories across Canada, the Industrial Development Office and the Canada Institute for Scientific and Technical Information.

## **TRANSPORT CANADA**

### **Canadian Air Transportation Administration**

Place de Ville, Tower B, Ottawa, Ontario K1A 0N8

Contact: Not Available.

Personnel: Total is 15.

Activities: Not available

### **Canadian Marine Transportation Administration**

Place de Ville, Tower A, 22nd Floor, Ottawa, Ontario K1A 0N7

Contact: Not Available.

Personnel: Total is 31.

Activities: Not available

### **Canadian Surface Transportation Administration**

Place de Ville, Tower C, Ottawa, Ontario K1A 0N5

Contact: Not Available.

Personnel: Data not available.

Activities: Not available

### **Research and Development Directorate - Headquarters Administration**

Place de Ville, Tower C, Ottawa, Ontario K1A 0N5

Contact: R.R. Mayes, Director General, Tel: (613) 992-7990

Personnel: Total is 26.

Activities: Not available

### **Road Safety and Motor Vehicle Regulation Directorate**

Place de Ville, Ottawa, Ontario K1A 0N5

Contact: Not Available.

Personnel: Data not available.

Activities: Not available



**Transportation Development Centre - Headquarters Administration**

1000 Sherbrooke Street West, P.O. Box 549, Place de l'Aviation, Montréal, Québec H3A 2R3

Contact: Not Available.

Personnel: Total is 43.

Activities: Not available



**REGIONAL DISTRIBUTION OF  
FEDERAL S&T ESTABLISHMENTS**

**1983-84**



# Distribution of Federal Scientific Establishments by Person Years, 1983-84





## TABLES





TABLE 1. STAFF AND EXPENDITURES OF SCIENTIFIC ESTABLISHMENTS, BY REGION, 1983-84

REGION	STAFF	INTRAMURAL SCIENTIFIC EXPENDITURES			
	SCIENTIFIC AND PROFESSIONAL	OTHER	TOTAL	R&D	TOTAL
	PERSON YEARS				\$'000,000
YUKON AND NWT	1	5	6	1.2	1.4
BRITISH COLUMBIA	559	1,274	1,833	67.6	126.2
ALBERTA	411	977	1,388	56.2	76.1
SASKATCHEWAN	192	526	718	30.6	40.7
MANITOBA	515	1,167	1,682	91.9	119.6
ONTARIO (EXCL. OTTAWA)	1,370	3,137	4,507	147.9	245.3
QUEBEC (EXCL. HULL)	463	1,227	1,690	91.1	120.1
NEW BRUNSWICK	102	310	412	16.5	23.6
NOVA SCOTIA	488	1,340	1,828	75.7	125.8
PRINCE EDWARD ISLAND	26	84	110	5.5	5.5
NEWFOUNDLAND	86	240	326	41.8	55.4
NTL CAPITAL REGION	3,962	7,446	11,408	402.0	669.0
TOTAL	8,175	17,733	25,908	1,028.0	1,608.7

TOTALS MAY NOT ADD DUE TO ROUNDING

TABLE 2. STAFF OF SCIENTIFIC ESTABLISHMENTS, BY DEPARTMENT AND BY REGION, 1983-84

DEPARTMENT OR AGENCY (1)	YUKON AND N.W.T.	B.C.	ALTA	SASK	MAN	ONT (EXCL OTTAWA)	QUE (EXCL HULL)	N.B.	N.S.	P.E.I.	NFLD	N.C.R.	TOTAL
	PERSON YEARS												
AECB	0	0	0	0	0	0	0	0	0	0	0	11	11
AECL	0	0	0	0	907	1,741	0	0	0	0	0	0	2,648
AGR	0	287	524	407	343	395	387	155	159	110	36	1,553	4,356
CCA	0	0	0	0	0	0	0	0	0	0	0	269	269
CIDA	0	0	0	0	0	0	0	0	0	0	0	16	16
CMHC	0	0	0	0	0	0	0	0	0	0	0	51	51
COMM	0	0	0	0	0	0	0	0	0	0	0	613	613
EMR	5	73	195	0	1	25	0	0	121	0	0	1,746	2,166
ENV	0	559	482	196	259	1,844	411	152	281	0	54	484	4,722
F&O	0	677	0	0	167	210	112	105	961	0	233	337	2,802
IAND	1	0	0	0	0	0	0	0	0	0	0	15	16
IDRC	0	0	0	0	0	0	0	0	0	0	0	94	94
IJC	0	0	0	0	0	23	0	0	0	0	0	23	46
MRC	0	0	0	0	0	0	0	0	0	0	0	50	50
NCC	0	0	0	0	0	0	0	0	0	0	0	7	7
ND	0	140	186	0	0	220	623	0	212	0	0	469	1,850
NEB	0	0	0	0	0	0	0	0	0	0	0	12	12
NFB	0	0	0	0	0	0	9	0	0	0	0	0	9
NHW	0	0	1	0	0	6	0	0	0	0	0	1,230	1,237
NMUS	0	0	0	0	0	0	0	0	0	0	0	1,051	1,051
NRC	0	97	0	115	5	40	105	0	94	0	3	2,964	3,423
NSERC	0	0	0	0	0	0	0	0	0	0	0	111	111
PW	0	0	0	0	0	0	0	0	0	0	0	54	54
RIE	0	0	0	0	0	0	0	0	0	0	0	167	167
TPT	0	0	0	0	0	3	43	0	0	0	0	81	127
TOTAL	6	1,833	1,388	718	1,682	4,507	1,690	412	1,828	110	326	11,408	25,908

TOTALS MAY NOT ADD DUE TO ROUNDING

(1) ACRONYMS ARE EXPLAINED IN THE GLOSSARY

TABLE 3. EXPENDITURES OF SCIENTIFIC ESTABLISHMENTS, BY DEPARTMENT AND BY REGION, 1983-84

DEPARTMENT OR AGENCY (1)	YUKON AND N.W.T.	B.C.	ALTA	SASK	MAN	ONT (EXCL OTTAWA)	QUE (EXCL HULL)	N.B.	N.S.	P.E.I.	NFLD	N.C.R.	TOTAL
	\$000,000												
AECB	0	0	0	0	0	0	0	0	0	0	0	1	1
AECI	0	0	0	0	61	83	0	0	0	0	0	0	145
AGR	0	16	26	18	15	19	29	7	8	5	1	70	218
CCA	0	0	0	0	0	0	0	0	0	0	0	23	23
CIDA	0	0	0	0	0	0	0	0	0	0	0	1	1
CMHC	0	0	0	0	0	0	0	0	0	0	0	3	3
COMM	0	0	0	0	0	0	0	0	0	0	0	53	53
EMR	--	5	12	0	0	1	0	0	9	0	0	126	155
ENV	0	30	23	12	16	112	22	6	12	0	3	28	268
F&O	0	55	0	0	13	11	13	9	73	0	27	11	215
IAND	0	0	0	0	0	0	0	0	0	0	0	1	2
IDRC	0	0	0	0	0	0	0	0	0	0	0	6	6
IJC	0	0	0	0	0	1	0	0	0	0	0	1	3
MRC	0	0	0	0	0	0	0	0	0	0	0	3	3
NCC	0	0	0	0	0	0	0	0	0	0	0	--	--
ND	0	12	14	0	0	13	38	0	15	0	0	43	137
NEB	0	0	0	0	0	0	0	0	0	0	0	1	1
NFB	0	0	0	0	0	0	0	0	0	0	0	0	0
NHW	0	0	0	0	0	0	0	0	0	0	0	58	59
NMUS	0	0	0	0	0	0	0	0	0	0	0	21	21
NRC	0	6	0	9	11	2	11	0	6	0	23	189	261
NSERC	0	0	0	0	0	0	0	0	0	0	0	7	7
PW	0	0	0	0	0	0	0	0	0	0	0	4	4
RIE	0	0	0	0	0	0	0	0	0	0	0	9	9
TPT	0	0	0	0	0	--	4	0	0	0	0	10	14
TOTAL	1	126	76	40	119	245	120	23	125	5	55	669	1,609

-- BELOW \$0.5 MILLION

TOTALS MAY NOT ADD DUE TO ROUNDING  
(1) ACRONYMS ARE EXPLAINED IN THE GLOSSARY



## **GLOSSARY**



Code	Department
AECB	Atomic Energy Control Board
AECL	Atomic Energy of Canada Limited
AGR	Agriculture Canada
CCA	Consumer and Corporate Affairs Canada
CIDA	Canadian International Development Agency
CMHC	Canada Mortgage and Housing Corporation
COMM	Department of Communications
EMR	Energy, Mines and Resources Canada
ENV	Environment Canada
F&O	Fisheries and Oceans
IAND	Indian Affairs and Northern Development
IDRC	International Development Research Centre
IJC	International Joint Commission
MRC	Medical Research Council of Canada
NCC	National Capital Commission
ND	National Defence
NEB	National Energy Board
NFB	National Film Board
NHW	Health and Welfare Canada
NMUS	National Museums of Canada
NRC	National Research Council of Canada
NSERC	Natural Sciences and Engineering Research Council of Canada
PW	Public Works Canada
RIE	Regional Industrial Expansion
TPT	Transport Canada





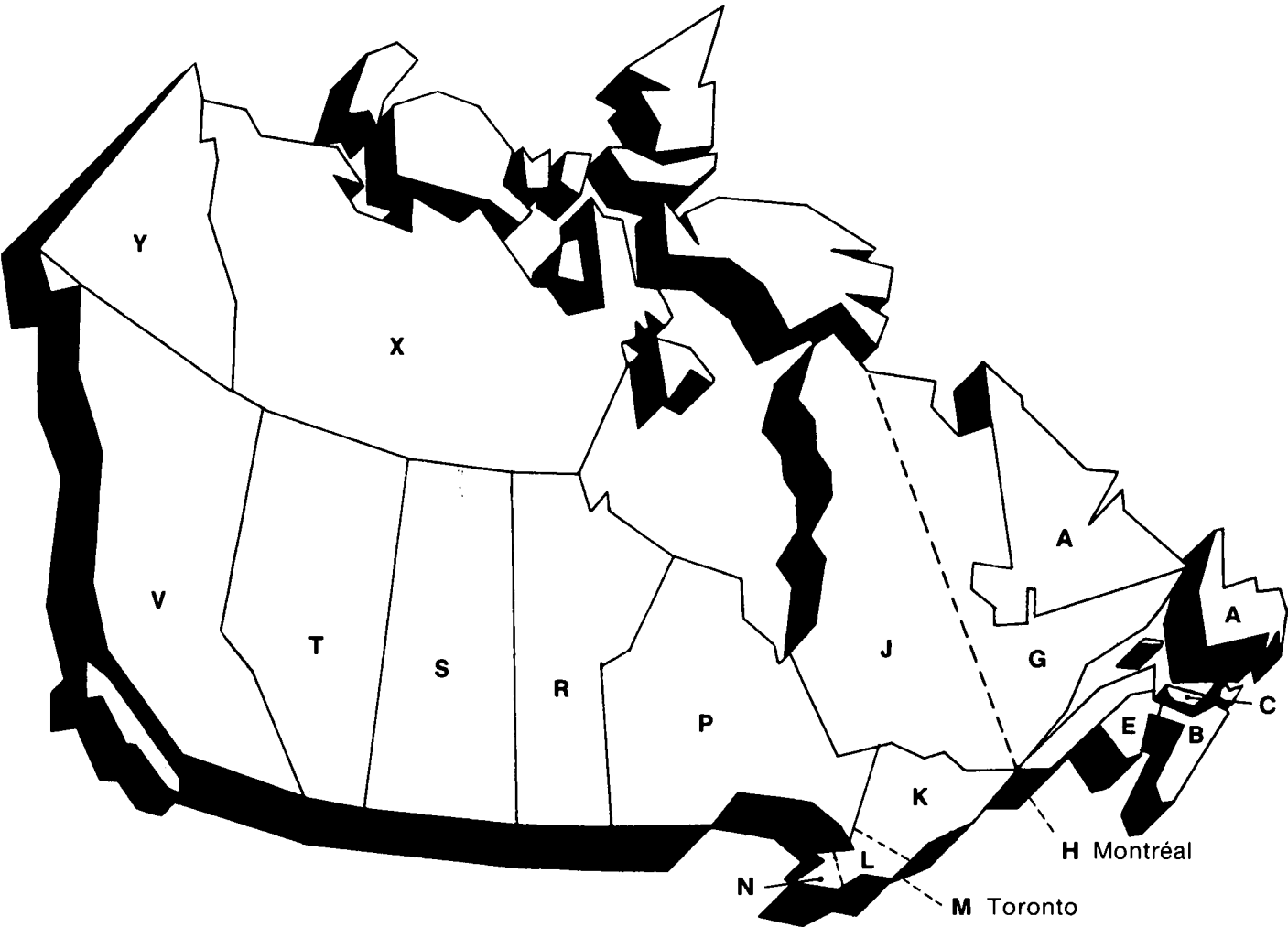
## **GEOGRAPHIC INDEX**



**NOTE: The Geographic Index refers only to the Performing Establishments.**



Geographic Index



- A Newfoundland
- B Nova Scotia
- C Prince Edward Island
- E New Brunswick
- G Eastern Quebec
- H Metropolitan Montreal
- J Western Quebec
- K Eastern Ontario
- L Central Ontario

- M Metropolitan Toronto
- N Southwestern Ontario
- P Northern Ontario
- R Manitoba
- S Saskatchewan
- T Alberta
- V British Columbia
- X Northwest Territories
- Y Yukon



**REGION-A NEWFOUNDLAND**

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DEPARTMENT OF COMMUNICATIONS

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NATIONAL RESEARCH COUNCIL CANADA

**REGION-X NORTHWEST TERRITOIRES**

ENERGY, MINES AND RESOURCES CANADA  
INDIAN AND NORTHERN AFFAIRS CANADA

**REGION-Y YUKON**





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