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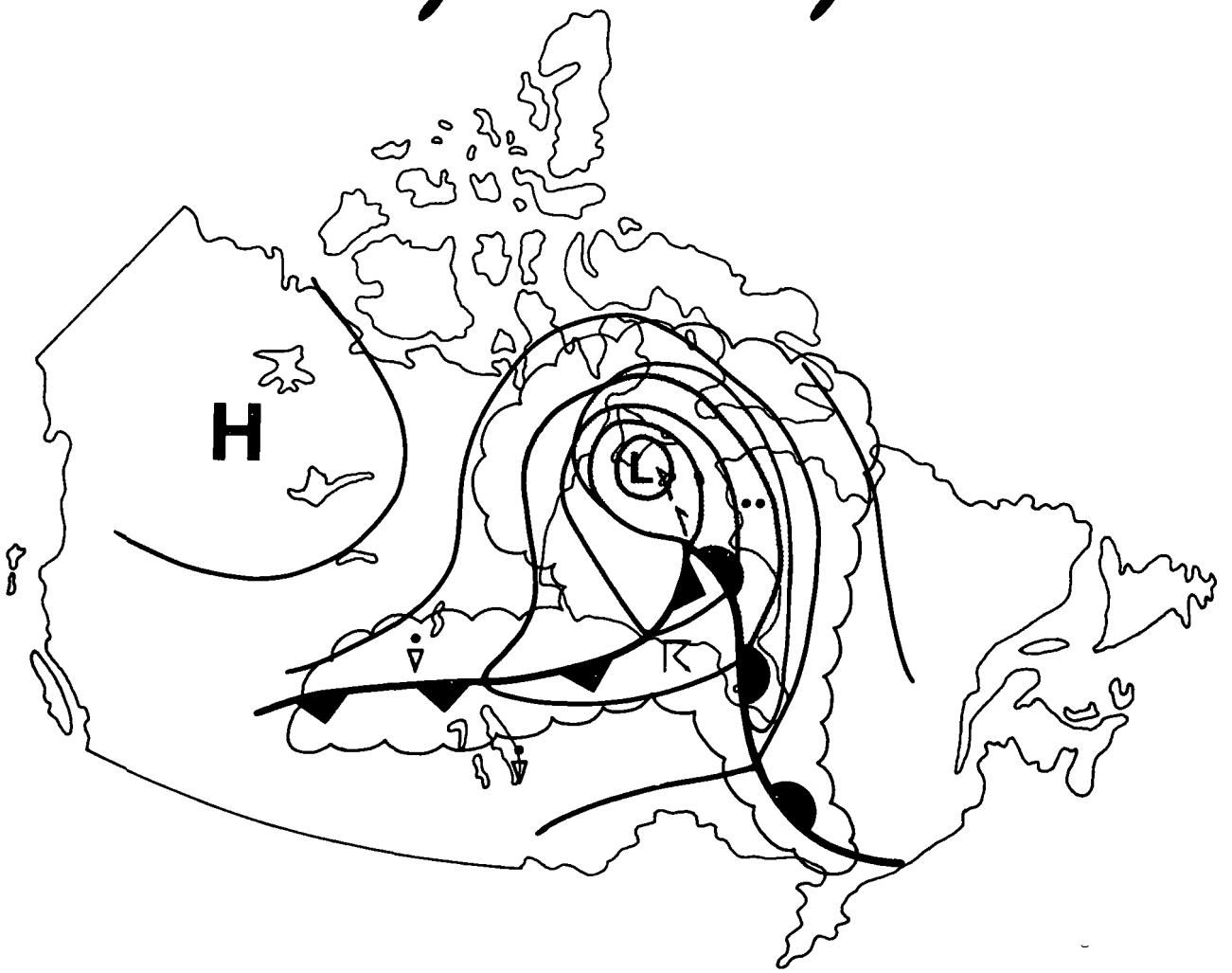
ATMOSPHERIC ENVIRONMENT SERVICE

Program Digest



1989 – 1990

AES MANAGEMENT SERIES

Climate Center Responds To The Green Plan With Restructuring

AES began to see the results of the Green Plan only a few days after its release, as the Canadian Climate Center announced a restructuring designed to help meet its new challenges

With the release of the Green Plan, the CCC will be entering a new phase in its evolution The climate change issue has become prominent in the last couple of years and the Green Plan contains a significant number of initiatives for the Climate Centre

The tasks required would be difficult and in some cases impossible within the existing structure of the CCC, which has remained essentially unchanged since its inception some eleven years ago

The majority of the 138 employees located in Downsview, Saskatoon and Ottawa will continue to do the same jobs under a new management structure There will be a number of new activities added to respond to the Green Plan challenge The clerical and administration staff especially, can look forward to some new opportunities and possibilities for training and development

The new CCC will consist of four operating branches reporting to the Director General, Climate Information, Climate Adaptation, Climate Research and Climate Response Strategies In addition a new Climate Program Liaison and Planning Office will be established to ensure an effective linkage between the CCC and the other organizations involved in the Canadian Climate Program It is expected that this new organization will be be in place prior to April 1 1991

On The Move...

Appointment

Caldwell, E to Energy Advisor ADMA

Assignment

Bourque, D from ACSD to Chief, APEC
Chagnon, L Mgr , Envir Partners Fund, Winnipeg
Cotnoir, A from ACTPQ Cornwall to MT QAES St-Laurent
Danks, M from shift super to Chief A/MAEO Bedford
Dube, D from Duty Fore Prairie Wx Centre to Ice Fore Ottawa
Edisbury, D from ST-OCE QAEM St-Laurent
Elie, M from QAEOI to Weather Insp , St-Laurent
Embree, S to AOCD Ottawa

Lateral Transfer

Isaacs, D from Ice Obs Toronto to Ice Anal Ottawa
Marchand, C from MT MAEN Gander to MT CMC

Leave

Jollet, C from QAEC St-Laurent to study leave
Provost, L from QAEMA St-Laurent to study leave

New

Lund, C to recep clerk Edmonton
Sortland, L to MT Edmonton

Passings

Scarlett, J H formerly Pacific Reg 27 years
Short, I formerly Data Acquis, Ont.

Laurent
Nicholas, G to Head, Appl Dev CAEI Winnipeg
Petropoulos, P from EG Jasper to EG Lethbridge
Ramsay, B from Ice Fore to Head DASB, Ice Ottawa
Robinson, D from EG Ft Reliance NWT to EG Cambridge Bay
Treloar, N to Atmos Proc Spec CAES Winnipeg

Retirement

Griffin, L R OIC Pincher Creek
McDonald, EG Edmonton
Panas, H Supt Gen Admin, Edmonton
Petrie, G CAEP Winnipeg
Saulnier, P CM Edmonton
Teshier, J EG Rocky Mountain

THE BUSINESS OF AES

The business of the Atmospheric Environment Service (AES) is to report past and present conditions and predict the future state of the atmosphere and closely-related phenomena for the safety of Canadians and to benefit Canada's economic and social life Such predictions include weather, climate and ice forecasts, severe weather, sea-state, sea-ice and iceberg warnings, and potential hazards related to these phenomena In addition, the AES must report on and predict the chemical composition of the atmosphere and of precipitation, as well as the impacts of chemical alteration of the atmosphere on various spheres of human activities Predictions are of an operational "real time" nature, or of a statistical or climatological variety, or the products of research

These services are provided to the general public or large segments of the public AES, through its scientific expertise and provision of meteorological services, can assist those authorities responsible for handling environmental emergencies

The AES cannot in general satisfy the demands of individual clients for specialized meteorological information It promotes the development of meteorological expertise in the Canadian private sector and universities to respond to such demands, and works closely with other government agencies and international organizations to apply meteorological science in the national interest.

H L Ferguson
Assistant Deputy Minister
Atmospheric Environment Service

April 1989

TABLE OF CONTENTS

LIST OF MAPS

PREFACE

ATMOSPHERIC ENVIRONMENT SERVICE

The Atmospheric Environment Service

Canada's Weather Service (Much More Than The Weather)

The Atmospheric Environment Service (AES), which is part of the federal Department of the Environment (Environment Canada), is best known for providing Canadians with timely weather information through broadcasts on television and radio, weather reports in newspapers, or through direct inquiries to its offices

The primary goal of AES is to ensure the safety of Canadians and the protection of their property This is met by providing warnings of approaching severe storms and through regular weather forecasts In addition, AES monitors sea ice and predicts its motion to protect ships and drill rigs in the Arctic and Atlantic, and determines the movement of atmospheric pollutants to help safeguard environmental quality and health

AES also contributes to the competitiveness of the Canadian economy, both nationally and internationally, by providing weather and climate information to sectors which are particularly weather-sensitive, and by supporting companies in the provision of a variety of services and in the development of specialized technological systems associated with atmospheric sciences

In addition, AES ensures that Canada meets its domestic and international obligations to civil aviation and military alliances by providing weather data and forecasts for Canadian territory and air space Its presence and activities in the north help strengthen Canadian sovereignty

In order to meet its goals, AES carries a solid research program and maintains environmental databases to answer questions on climatic applications Research addresses chemical alterations to the atmosphere including major aspects of acid rain, toxic air pollutants, the high level ozone layer, and anticipated changes in climate associated with increasing "greenhouse" effect

In recent years, AES has been the Departmental lead in the development of a peacetime emergency response policy, including the development and implementation of emergency plans, arrangements and facilities to fulfill the department's mandate when emergency events occur

Over 100 Years of Service

In Canada, official weather observations were introduced when the British government established an observatory in Toronto, Ontario in 1839-40 The observatory was taken over by the Canadian government in 1853, and in 1871, an additional $5,000 was allocated "for meteorological observations with a view to ultimately establishing storm-signals" Over the next decade, professor G T Kingston of the observatory proceeded to establish a national meteorological service serving the original Eastern provinces

The weather observing station network spread West with the telegraph system and weather forecasts were issued daily for all provinces by about 1900 With the development of technology in the 1920s, and the increasing population and mobility of Canadians, the network spread into the sub Arctic, and after World War II, into the far Arctic During these decades, the original public and maritime services were expanded to agriculture and forestry and then to the fast-growing aviation sector In the mid-1950s, ice observing and forecasting were introduced for the Arctic in summer, and along the Atlantic coast and the Gulf of St Lawrence in winter In the 1970s, air quality services were added to the Service's responsibilities and the Canadian Climate Centre was established to reflect the increasing load of climate data management and the needs of climate research and applications In 1989, a Secretariat for the Changing Atmosphere will be established to strengthen the AES ability to develop a Canadian response to the growing challenges of atmospheric pollution

Forecasting The Weather

Weather forecasting is beneficial and often extremely important to Canadians Not only does weather forecasting help us to plan our daily activities such as dressing for the outdoors, driving to work, farming and fishing, but it also provides us with warnings about the possibility of severe weather that could threaten our lives and property

The weather forecasting service provided by AES is publicly funded to ensure the safety of all Canadians and the security of their property, to contribute to the efficiency of the economy, and to help safeguard environmental quality The services to Canadians include timely warnings of such events as winter storms, tornadoes, extreme cold, frost in the growing season and strong winds Almost every Canadian is also interested in the more common weather forecasts, predicting such elements as maximum and minimum temperatures, precipitation occurrence and cloudiness, not only for the present day, but for the following four days as well The AES also prepares forecasts and warnings suitable to meet the particular needs of the marine, aviation, agriculture and forestry sectors which are major components of the Canadian economy In total, AES issues forecasts for 436 urban, rural, aviation and marine areas

Weather forecasts and warnings are distributed to users in Canada mainly through mass communications methods such as the commercial media, Weatheradio Canada, and tape-recorded telephone messages The Canadian Coast Guard Marine radio system and the aviation radio system broadcast AES weather information in conjunction with navigation safety information Consultation on current and forecast weather and its impact on various activities is available to the public by telephone or in person at 64 weather offices across Canada

The Basic Components of Weather Forecasting

Providing weather forecasts is a three-step process

Step one is collecting all the available information about current weather A large observing network does this job In Canada, some 467 stations take hourly weather observations, 33 additional stations sample the upper atmosphere twice daily using instrumented balloons, 10 satellite centres receive continuous measurements and 14 weather radars cover most of the populated area of southern Canada Selected data, Canadian and international, are then sent on a Canada-wide telecommunications network to all AES forecasting centres These data give the forecaster a "snapshot" of the world's weather at one point in time

Step two is forecast production At the Canadian Meteorological Centre (CMC) in Montreal, weather forecast models are run on a CRAY supercomputer These models can simulate or project how the atmosphere is most likely to evolve over the next few days, from the information streaming in from Canada and around the globe These projections of atmospheric conditions are then transformed by highly trained and experienced weather forecasters into predictions of regional conditions Meteorologists at nine regional Weather Forecast Centres use these computer-produced weather maps along with satellite and radar weather data, and other information, to produce the detailed forecasts and weather warnings for their own regions

Step three is delivery AES provides these forecasts and warnings through a national communication system and through 64 Weather Offices, to radio, television, and newspapers throughout Canada They are also made available on tape for telephone callers and through continuous broadcasts on Environment Canada's Weatheradio system

Climate Services and Research

Besides observing and forecasting current weather, the AES also pursues an active climatology program it maintains detailed records, analyses patterns and trends, and uses these as a basis for short-term applications and long-term climate predictions

The Canadian Climate Centre and the regional climate offices respond to inquiries regarding climate data and information These inquiries normally involve the provision of compiled data (digital, microfilm and in printed format), maps, atlases, guides, manuals, bibliographies, climate analyses and/or climate studies These services and the long-term success of climatology in Canada require the maintenance of national, quality-assured climate archives

The AES is also actively involved in climate-related scientific activities such as marine applications, remote sensing of hydrometeorological parameters, and analysing the impacts of climate and its variability on agriculture, forestry, industry and arctic environments The research and development activities include research on the water resources of Canada and research related to the production of monthly and seasonal forecasts of temperature and precipitation, as well as the development of a Canadian General Circulation Model for long term climate prediction

Of particular interest is the investigation of long-term climate warming caused by the "greenhouse" effect In this vein, policy-makers and senior scientists from around the world met in Toronto during June 1988 to examine the credible evidence concerning atmospheric alteration and its effects At this international conference entitled "The Changing Atmosphere Implications for Global Security", participants had the opportunity to discuss and develop policy positions and make recommendations for further actions In February 1989, Environment Canada and External Affairs co-ordinated and hosted a meeting, in Ottawa, of over 80 legal and policy experts from 25 countries to develop principles for inclusion in an umbrella convention for the protection of the atmosphere This was followed by the Environmental Summit in The Hague in March 1989, and in late 1989, a Ministerial Conference on Atmospheric Pollution and Climate Change will be held in the Netherlands

An Army of Volunteers

An army of more than 2,000 volunteer climate observers collect information on weather and climate on land and at sea The land-based network is more than a century old and is operated by a cross-section of Canadians, including farmers, homemakers, pensioners and teachers, all taking temperature and precipitation readings twice a day in their backyards or gardens These observations provide much of the statistics essential to our national climate archives

In addition, 3,500 severe weather watchers serve their fellow citizens by quickly reporting thunderstorms, tornadoes and hailstorms to the regional centres

Furthermore, around 420 ships are registered with the AES to take volunteer marine weather observations In a year, more than 120,000 of these observations are transmitted by ship officers and are used for the preparation of marine forecasts These observations, taken mostly over the Great Lakes and along the coastlines, are also archived and used for marine climatology studies Since 1986, with the inception of the volunteer Marine Reporting (MAREP) Program, AES annually receives reports of near-shore weather reports from thousands of small-craft operators

Keeping Watch on Offshore Ice

AES is also responsible for monitoring and forecasting ice movements along Canada's coastlines and on inland waterways Ice reconnaissance aircraft use

advanced radar equipment to observe sea ice along the Atlantic coast, the Great Lakes/St Lawrence system and in the Arctic Icebergs in the Newfoundland and Labrador coastal areas are also surveyed The Ice Centre in Ottawa combines this aircraft information with satellite observations and weather data and forecasts to produce detailed ice charts and ice forecasts so that ships can plot a safe course through ice-infested waters These are used by fishermen, shipping companies and offshore oil and gas exploration companies to prevent marine accidents that could endanger both lives and the fragile marine environment

Research and Development

AES is a scientific organization and depends on research and development to improve its services, and to be at the forefront of the environmental sciences

As experts on atmospheric processes, the AES scientists play a vital role in advising the government and industrial decision-makers on such key issues as acid rain, toxic chemicals and climate change This expertise is backed by painstaking research from the ground up to the borders of space and from the chemistry lab to the computer room Monitoring programs are maintained to determine changes and trends in the quality of Canada's air and rain

AES has had major successes It helped to pioneer the techniques which permit computer forecasting of weather up to 5 and 6 days These are now in use world-wide Processing systems developed in co-operation with Canadian industry deliver weather satellite data across Canada The AES is recognized as a world leader in the science of acid rain and long-range transport of pollution, including arctic haze Its research on climate change is recognized internationally as first-rate In collaboration with Canadian industry, the AES has developed sophisticated instrumentation to measure the high-altitude ozone layer both from the ground and from space The ground based instrument, the Brewer Spectrophotometer, has been designed in AES laboratories and has been sold in 11 countries to date This modern instrument, with its computer-controlled solar tracker (also of AES design), is capable of more accurate measurements of ozone that the classical instrument used in the world network for over 40 years

The future looks exciting Satellites and supercomputers present opportunities to provide more accurate and timely weather warnings as our understanding of the atmosphere improves Very long-range forecasts of general weather conditions up to months in advance seem possible At the same time, the details of the transport and transformation of acidic and other pollutants are emerging from research efforts

AES can't do it alone It works with Canadian industry, with universities, with provincial agencies, other federal departments and other countries Many atmospheric issues are global in nature and the AES is a leader in contributing to world-wide advances in atmospheric sciences and drawing on the efforts of other countries In collaboration with AES and the Natural Sciences and Engineering Research Council, Canadian Universities are also strengthening their role in atmospheric research

Partnerships in Canadian Meteorological Services

The Atmospheric Environment Service is the major player in meteorology in Canada However, an increasing demand for meteorological services has compelled the AES to look to others for the provision of some of these services The growing Canadian private meteorological sector is seen as an important player and, with continuing development, could be relied upon to assist in meeting these demands

To foster the growth of private meteorology in Canada, the AES, in consultation with representatives from the private sector, has developed a five year plan to encourage private sector firms to take over provision of specialized services where appropriate and to develop new markets and new services This includes the encouragement of companies to develop communications services for specialized weather data The intent of this plan is not to privatize the provision of basic meteorological services already paid for by the taxpayer The plan recognizes that by providing new services and expanding markets, the private sector will provide greater economic benefits to the country by the judicious application of atmospheric science to a wide range of specific problems

Partners in Global Weather

Weather knows no frontiers The World Meteorological Organization (WMO), a United Nations agency based in Geneva, co-ordinates the global distribution and exchange of weather information among 160 countries

Canada both benefits from and contributes to the world meteorological community by sharing its data and participating in joint programs such as the World Climate Program and in WMO training programs

In addition, Canada is an active partner in global research programs that deal with drought, carbon dioxide emissions and climate change, protecting the ozone layer and efforts to improve weather forecasting on a world-wide basis This involvement is exemplified in the contribution of Canada to the development of the Montreal Protocol for the Protection of the Ozone Layer which was signed by 25 countries in September 1987 In 1988, in response to growing public and political interest in climate warming induced by greenhouse gases and in related atmospheric problems, Canada participated in the formation of the United Nations Intergovernmental Panel on Climate Change (IPCC) The objectives of the IPCC center on three specific tasks the assessment of the available scientific information on climate change, the assessment of environmental and socio-economic impacts of climate change, and the formulation of response strategies

CHAPTER 1

INTRODUCTION

ATMOSPHERIC ENVIRONMENT SERVICE

1. INTRODUCTION

1 1 PURPOSE

"The Program Digest" is an annual publication that describes

- the Atmospheric Environment Service (AES), as well as its objective, mandate and responsibilities, and
- the AES budget by program sub-activity (SA 1) and program sub-sub-activity (SA 2)

"An Addendum to the Program Digest" is also issued in conjunction with the Program Digest This publication describes

- sub-sub-sub-activity (SA 3) and the program activity element (SA 4) level definitions of the program activities,
- the relationship between responsibility centres and SA 3 program activities, and
- the AES financial and human resource allocations at the SA 3 and SA 4 levels by organizational unit

1 2 MATERIAL PRESENTED IN THE PROGRAM DIGEST

The preface gives the reader an introduction to the Atmospheric Environment Service (AES) and the activities it pursues Chapter 2 describes AES responsibilities and its mandate within Environment Canada Chapter 3 discusses its most current objectives and priorities Information relating to AES program activities and organizational units is provided in Chapters 4 and 5 respectively

Any comments or suggestions for amendments to this document should be forwarded to the Policy, Planning and Assessment Directorate

CHAPTER 2

THE DEPARTMENT OF THE ENVIRONMENT

ATMOSPHERIC ENVIRONMENT SERVICE

2. THE DEPARTMENT OF THE ENVIRONMENT

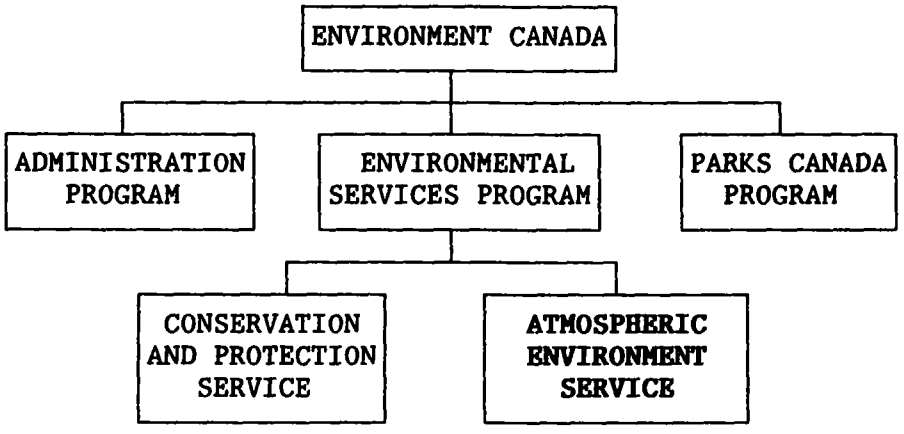
2 1 DEPARTMENTAL PROGRAM STRUCTURE

Environment Canada has grouped its activities into three Programs (as shown below)

- **the Environmental Services Program** which is divided in two activities **Conservation and Protection (C&P)** and the **Atmospheric Environment Service (AES)** This Program provides information on weather, climate, ice, sea state and air quality (**AES**) It also promotes the conservation and protection of inland waters, lands and wildlife, and develops preventive or corrective measures for maintaining and improving environmental quality (C&P)

- **the Parks Program** which establishes, develops and manages national parks, national historic parks and sites, heritage canals and co-operative heritage areas

- **the Administration Program**, which provides corporate management, strategies, policy and planning, guidance on priorities issues, corporate finance, personnel and administrative support services to the Department It also includes the administration of the Environmental Assessment and Review Process (EARP)



2 2 DEPARTMENT LEGAL MANDATE AND RESPONSIBILITIES

The Department of the Environment came into being in June, 1971 following proclamation of the Government Organization Act, 1970 Known now as Environment Canada, the Department was created from components within the federal structure that relate to the natural environment Subsequent organizational adjustments were effected through the Government Organization Act of 1979 which separated the fisheries and marine component, by Order-in-Council PC-1979-1617 which added Parks Canada to the Department's structure, and by Order-in-Council PC-1984-3200 which transferred the Canadian Forestry Service to Agriculture Canada

The Government Organization Act (GOA), 1979 and the subsequent Miscellaneous Statutes Law Amendment Act (June 1984) and Order-in-Council PC-1984-3200 which modified the effect of the Act, state that the duties, powers and functions of the Minister of the Environment extend to and include

(i) all matters over which Parliament has jurisdiction not otherwise assigned to other federal departments, boards and agencies relating to
- the preservation and enhancement of the quality of the natural environment, including water, air and soil quality,
- renewable resources including migratory birds and other non-domestic flora and fauna,
- water,
- **meteorology;**
- the enforcement of rules and regulations made by the International Joint Commission relating to boundary waters, and questions arising between the United States and Canada insofar as they relate to the preservation and enhancement of the quality of the natural environment, and
- the co-ordination of the policies and programs of the Government of Canada respecting the preservation and enhancement of the quality of the natural environment

(ii) such other matters over which Parliament of Canada has jurisdiction relating to the environment as are by law assigned to the Minister

Orders-in-Council PC-1979-1617 and PC-1979-1841 added responsibilities for national parks, national battlefields, historic sites and monuments and certain canals to the Minister of the Environment

The GOA recognizes that preserving and improving Canada's environmental quality is a responsibility of all federal departments, the provincial governments and the public The Act gives to the Minister of the Environment broad responsibilities to promote practices that lead to the improvement and preservation of environmental quality It also enables the Minister to co-operate with provincial governments and their agencies and any other program or organization having similar environmental objectives As well, the GOA empowers the Minister to establish guidelines and advise heads of departments, boards and agencies of the federal government in all matters pertaining to preserving and improving the quality of the natural environment Finally, it allows the Minister to enter into agreements with other governments or agencies for the purpose of carrying out programs for which the Minister is responsible

CHAPTER 3

OBJECTIVES PRIORITIES AND HIGHLIGHTS

ATMOSPHERIC ENVIRONMENT SERVICE

3 1 OBJECTIVE OF ENVIRONMENT CANADA

- to foster harmony between society and the environment for the economic, social and cultural benefit of present and future generations of Canadians

3 2 OBJECTIVE OF THE ENVIRONMENTAL SERVICES PROGRAM

- to promote and undertake programs to protect and enhance the quality of the environment, and programs designed to improve the management and sustained economic utilization of the wildlife and inland water resources of Canada

3 3 OBJECTIVE OF THE ATMOSPHERIC ENVIRONMENT SERVICE

- to ensure that Canada has adequate information on the atmosphere, ice and sea state for the safety of life, the security of property, the greater efficiency of economic activities and for the maintenance and enhancement of environmental quality

3 4 ATMOSPHERIC ENVIRONMENT SERVICE'S PRIORITIES 1989 - 1994

In recognition of Canadians' growing needs for weather services, the Atmospheric Environment Service has developed a strategic plan for improving these services over the next twenty years This plan provides the framework to guide AES activities in support of government priorities, development of services, interdepartmental, federal-provincial, private sector and international agreements, and good management practices It also recognizes that these changes are desirable, and in some cases inevitable, if the Atmospheric Environment Service is to meet Canadians' needs in the future

Priorities

Over the next five years, AES' efforts will focus on

1 Providing improved marine weather, sea state and ice services in areas of greatest risk by

- improving the detection, prediction and communication of critical marine weather, sea state and ice information,
- extending its dedicated marine weather service, and
- enhancing its ice reconnaissance capability

2 Providing improved warnings of severe weather conditions by

- exploiting recent advances in weather radar technology to improve the timeliness and accuracy of severe weather warnings,
- improving the effectiveness of the dissemination of weather warnings, and
- increasing public and media understanding of the meaning of the severe weather warnings

3 Improving the Department's environmental emergency response capability by

- improving the data acquisition systems available to AES regional offices to provide more accurate meteorological information needed in response to environmental emergencies,
- improving computer models for better prediction of the dispersion of substances accidentally released into the atmosphere, and
- co-operating with organizations involved in emergency planning at all levels of government, to achieve effective and well co-ordinated plans

4 Ensuring that Canada is able to deal with the environmental changes produced by chemical alterations to the atmosphere and contribute to the implementation of the Canada Environmental Protection Act (CEPA) by

- continuing to monitor and research the subject, to provide well-founded information and advice to Canadian and international decision-makers,
- developing public awareness of the potential impacts and alternatives associated with these changes, and
- building interdepartmental and international co-operation to address the issue ensuring strong Canadian input to the 1990 Second World Climate Conference, working towards international acceptance, by 1991, of a revised Montreal protocol to eliminate ozone-depleting chemicals, and developing a "Law of the Atmosphere" by 1992

5 Strengthening the relationships between the environment and the economy for the benefit of both by

- increasing the effectiveness of the AES basic science program (infrastructure) in support of environmental research, decision-making and sustainable economic development,
- communicating the importance of environmental considerations, both for short-term economic decisions and for sustainable development over the long term,
- expanding overall Canadian capabilities in weather services and atmospheric science research through partnership initiatives with the Canadian private meteorological sector, universities, other government departments and provincial agencies, and

- increasing research into client needs and monitoring of client satisfaction, and demonstrating the economic usefulness of AES products and services

6 Improving the efficiency and effectiveness of AES operations and management by

- continuing implementation of the AES Strategic Plan, taking advantage of advances in science and technology to improve productivity and efficiency,
- actively seeking external partners, and creating opportunities to multiply AES investments through external leverage, and
- improving forecast quality and delivery, and the integration of ice, weather, climate and air quality services

3 5 1989 - 1990 HIGHLIGHTS BY PROGRAM AREAS

1 Weather Services

- Introduce new weather radar data processing technology for faster and more accurate severe storm detection and warning,
- Install new weather radar equipment in New Brunswick for the improved detection and warning of severe weather,
- Improve marine weather forecast and warning services through the installation of more weather buoys on both coasts and the Great Lakes, and the commencement of dedicated marine forecasting programs in Halifax and Gander,
- Expand Weatheradio coverage by adding five repeater stations around the Great Lakes; and by installing two new Weatheradio stations in the province of Quebec, each with five repeater stations, to expand coverage to the lower St Lawrence River, Gaspe, eastern townships, Laurentians, Lac St Jean and Beauce areas,
- continue implementation of the AES Strategic Plan by setting up a test-bed Weather Service Office in Toronto and Halifax by the end of the fiscal year, and
- Complete implementation of the new data communication systems

2 Climate Services

- Continue the development of an improved capability to forecast long-term climate change based on scenarios about the chemical composition of the atmosphere and changes in that composition,
- Develop and implement a Climate Extremes Reporting and Prediction System to issue weekly bulletins on climate and, when required, special bulletins on Prairie drought,
- Assess the potential impact of climate warming on the agriculture, energy, forestry, recreation and transportation sectors, and publish these assessments in the Climate Change Digest Series,
- Co-host, with the National Hydrology Research Institute, a workshop on the application of remote sensing in hydrology, and
- Publish a new edition of "The Climates of Canada"

3 Ice Services

- Complete installation of the new ice data analysis and communication system, at the Ice Centre facility, to provide for faster dissemination of current and new products and ice information,
- Transfer a substantial part of the ice data acquisition activity to a Canadian private sector firm, and
- Focus ice research on the use of remote sensing equipment to detect ice and icebergs

4 Acid Rain, Air Quality Services and Atmospheric Research

- Continue participation in a joint Canada-United States major field experiment which will examine how NO_x and SO_x change chemically in the atmosphere, how they are transported and where they are deposited,
- Participate in the joint Canada-U S Northern Wetlands Project to study the contribution of the wetlands to the generation of methane, a greenhouse gas,
- Complete and publish studies on forest decline in western and eastern Canada,
- Contribute to the development of the NOx/VOC control program,
- Organize an international acid rain aquatics effects workshop,
- Complete establishment of a national atmospheric chemistry data base from the integration of federal and provincial air quality monitoring stations' data, and
- Report on international progress on the implementation of the 1987 Montreal Ozone Protocol, continue atmospheric ozone measurements in Canada and publish an analysis of ozone trends from Canadian data

5 Management and Common Support Services

- Continue implementation of the AES Strategic Plan, (e g , continue development and implementation of improved automation and science and technology applications),
- Follow-up on the recommendations of the February 1989 meeting of world legal and policy environmental experts to ensure international action to protect the atmosphere, and promote and participate in the development of a suitable international convention for the protection of the atmosphere,
- Continue to foster the development of the capacity and expertise of the Canadian private sector and universities in the delivery of specialized weather, climate, ice and air quality services,
- Revise and sign Memoranda of Understanding relative to meteorological and associated services, with the Departments of Agriculture, Fisheries and Oceans, National Defence and Transport, and
- Complete input to DOE Increased Ministerial Authority and Accountability agreement with Treasury Board

CHAPTER 4

BUDGET BY PROGRAM ACTIVITY

ATMOSPHERIC ENVIRONMENT SERVICE

4 1 AES BUDGET BY SUB-ACTIVITY

4 1 1 PROGRAM ACTIVITY STRUCTURE

Environment Canada has three Main Estimates Programs as described in Section 2 1 Administration, Environmental Services and Parks Canada The Environmental Services Program is divided into two activities, one of which is AES, as indicated below

As a service, AES provides

i) past, present and future weather, climate, sea state and ice information for all areas of Canada and contiguous waters,
ii) advice on the impact of these elements on human activities and on the application of the atmospheric sciences to weather sensitive operations in such activities as forestry, agriculture, aviation and national defence,
iii) research on chemical and physical processes of the atmosphere to improve the prediction of environmental elements, and co-operation with emergency response organizations in the prediction of the dispersion of substances accidentally released into the atmosphere,
iv) assessments of the impacts of human activity on the atmospheric environment, including the provision of information and policy advice on the atmospheric aspects of greenhouse gases, acid rain, toxic chemicals and the depletion of the stratospheric ozone layer,
v) participation in international programs and negotiations related to the above elements, and
vi) promotion and/or co-ordination of scientific programs in these areas including the scientific leadership of the Canadian Long Range Transport of Airborne Pollutants program

The diagram on the following page, called "A Single Service", demonstrates the distribution of the services and resources of AES

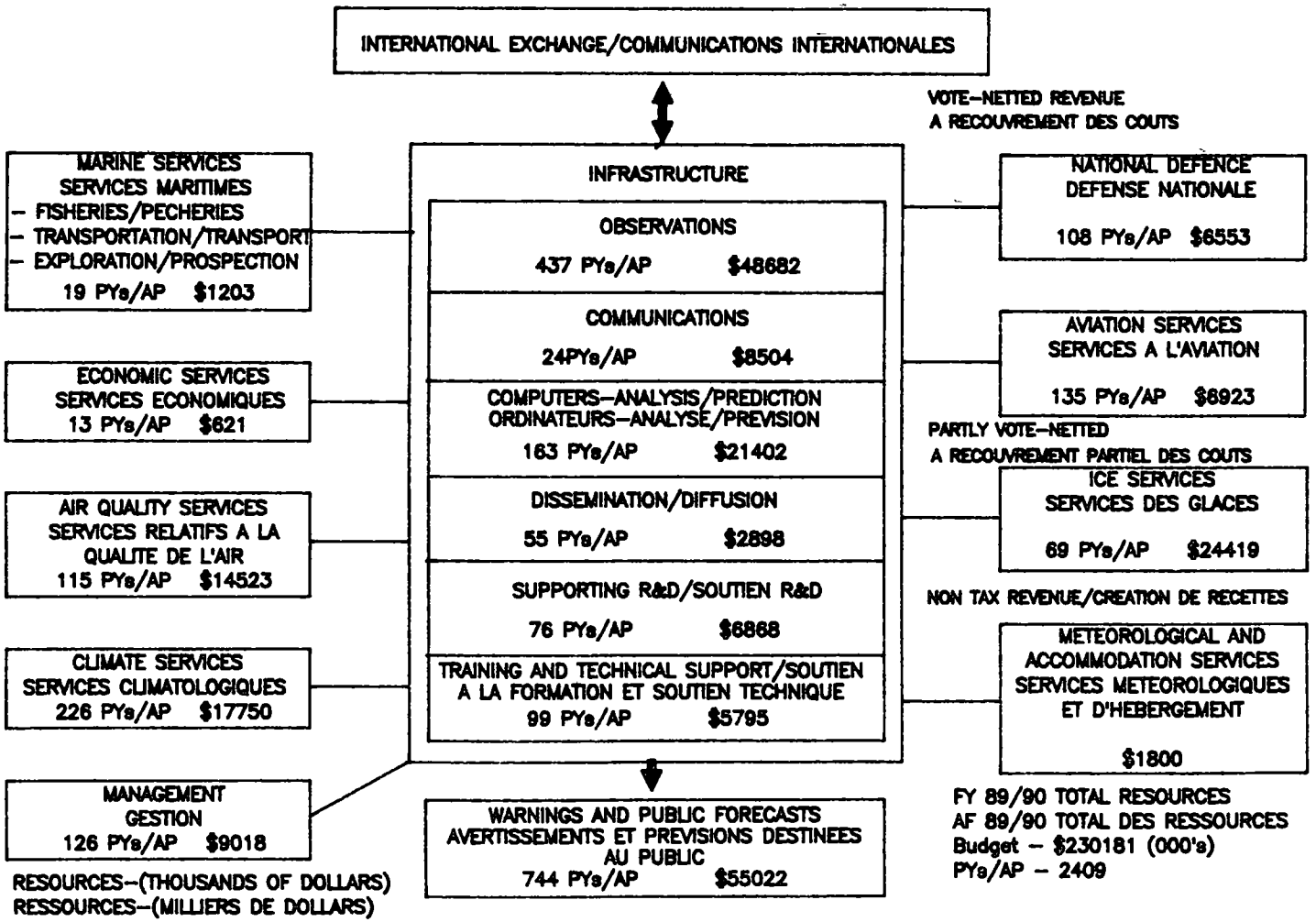
The Atmospheric Environment Service has four different program activity levels to depict and describe budgets and program information in varying degrees of detail with the program activity element providing the most detail They are

Sub-Activity	SA 1 Level
Sub-Sub-Activity	SA 2 Level
Sub-Sub-Sub-Activity	SA 3 Level
Program Activity Element	SA 4 Level

For fiscal year 1989/90 the AES program activity structure will consist of 5 sub-activities, 21 sub-sub-activities, 48 sub-sub-sub-activities, and 159 program activity elements

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
1989-1990

"A SINGLE SERVICE" / "SERVICE POLYVALENT"



The AES budget and programs are given by the following sub-activity (SA 1) and sub-sub-activity (SA 2) later in this chapter

Sub-Activity (SA 1)	Sub-Sub-Activity (SA 2)
1000 Weather Services	1100 Public Weather Services
	1200 Marine Weather Services
	1300 Aviation Weather Services
	1400 Economic Weather Services
	1500 Canadian Forces Weather Service
	2000 Data Acquisition
	3000 Weather Services Support Systems
4000 Climate Services & Research	4100 Climate Services
	4500 Climate Research and Development
	4600 Climate Services Support Systems
	4700 Canadian Climate Program
5000 Ice Services	5100 Ice Reconnaissance and Data Acquisition
	5200 Ice Analysis and Forecasting
	5300 Ice Climate Services
	5400 Ice Services Support Systems
	5500 Ice Services Research and Development
6000 Air Quality Services and Atmospheric Research	6100 Air Quality Services
	6300 Air Quality Research
	6700 Air Quality and Research Support Services
0800 Management and Common Support Services	0810 Management
	0830 Common Support Services

The Addendum of the Program Digest contains the AES sub-sub-sub-activity (SA 3) and program activity element (SA 4) structures and the corresponding budget information.

ATMOSPHERIC ENVIRONMENT SERVICE

4 1 2 1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

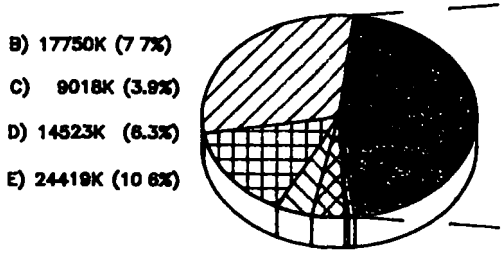
SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
) MANAGEMENT & COMMON SUPPORT SERVICES							
10 MANAGEMENT		28 0	1576 5	685 7	1407 0		3669 2
30 COMMON SUPPORT SERVICES		98 0	3964 3	1191 1	194 0		5349 4
	TOTAL	126 0	5540 8	1876 8	1601 0		9018 6
1 WEATHER SERVICES							
1100 PUBLIC WEATHER SERVICES		468 4	22516 3	1753 2	40 0		24309 5
1200 MARINE WEATHER SERVICES		19 0	993 8	209 4			1203 2
1300 AVIATION WEATHER SERVICES		135 5	6389 8	532 7			6922 5
1400 ECONOMIC WEATHER SERVICES		13 4	582 6	38 0			620 6
1500 CANADIAN FORCES WEATHER SERVICES		108 0	6178 0	375 0			6553 0
2000 DATA ACQUISITION		436 5	19182 2	17683 0	11817 2		48682 4
3000 WEATHER SERVICES SUPPORT SYSTEMS		692 2	35288 9	29808 2	9507 8	1575 0	76179 9
	TOTAL	1873 0	91131 6	50399 5	21365 0	1575 0	164471 1
4 CLIMATE SERVICES & RESEARCH							
4100 CLIMATE SERVICES		116 8	5199 3	1723 4	432 0		7354 7
4500 CLIMATE RESEARCH AND DEVELOPMENT		52 5	2536 8	970 0	399 0	200 0	4105 8
4600 CLIMATE SERVICES SUPPORT SYSTEMS		54 4	2433 5	2720 8	243 5		5397 8
4700 CANADIAN CLIMATE PROGRAM		1 8	88 6	803 0			891 6
	TOTAL	225 5	10258 2	6217 2	1074 5	200 0	17749 9
5 ICE SERVICES							
5100 ICE RECONNAISSANCE & DATA ACQUISITION		28 0	1820 0	12699 0	3025 0		17544 0
5200 ICE ANALYSIS & FORECASTING		28 7	1185 3	2194 0	574 9		3954 2
5300 ICE CLIMATE SERVICES		4 0	212 0	97 8	47 0		356 8
5400 ICE SERVICES SUPPORT SYSTEM		4 0	161 0	310 0	5 0		476 0
5500 RESEARCH AND DEVELOPMENT -ICE		4 8	276 0	445 0	1366 6		2087 6
	TOTAL	69 5	3654 3	15745 8	5018 5		24418 6
6) AIR QUALITY SERVICES & RESEARCH							
6100 AIR QUALITY SERVICES		21 3	1232 9	439 8	500 0		2172 7
6300 AIR QUALITY RESEARCH		84 2	4926 9	3879 9	1682 0	314 0	10802 8
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES		9 5	726 3	629 0	192 0		1547 3
	TOTAL	115 0	6886 1	4948 7	2374 0	314 0	14522 8
GRAND TOTAL		2409 0	117471 0	79188 0	31433 0	2089 0	230181 0

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
1989–1990

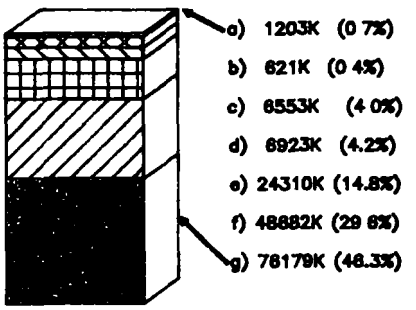
4 1 3 TOTAL BUDGET BY SUB–ACTIVITY
BUDGET TOTAL PAR SOUS–ACTIVITE

ALL SERVICES/TOUS LES SERVICES

TOTAL BUDGET TOTAL – 230181K



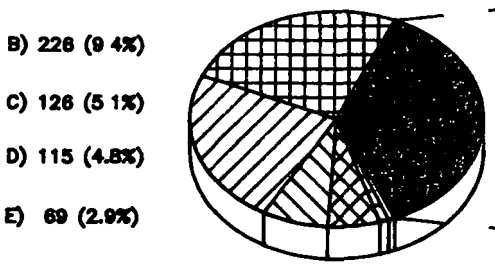
WX SERVICES/SERV METEOROLOGIQUES
IN MORE DETAIL/PLUS DETAILLES



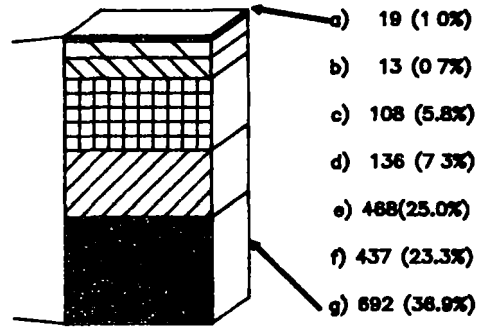
4 1 4 PERSON YEARS BY PROGRAM SUB–ACTIVITY
ANNEES–PERSONNES PAR SOUS–ACTIVITE

ALL SERVICES/TOUS LES SERVICES

TOTAL PYS/TOTAL DES AP – 2409



WX SERVICES/SERV METEOROLOGIQUES
IN MORE DETAIL/PLUS DETAILLES

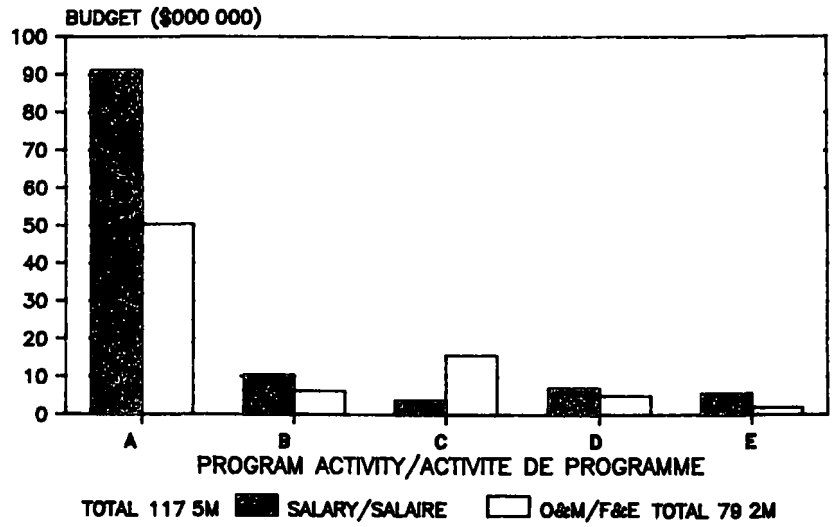


A) WEATHER SERVICES/SERVICES METEOROLOGIQUES
B) CLIMATE SERVICES/SERVICES CLIMATOLOGIQUES
C) MANAGEMENT/GESTION
D) AIR QUALITY SERVICES/SERVICES RELATIFS A LA QUALITE DE L'AIR
E) ICE SERVICES/SERVICES DES GLACES

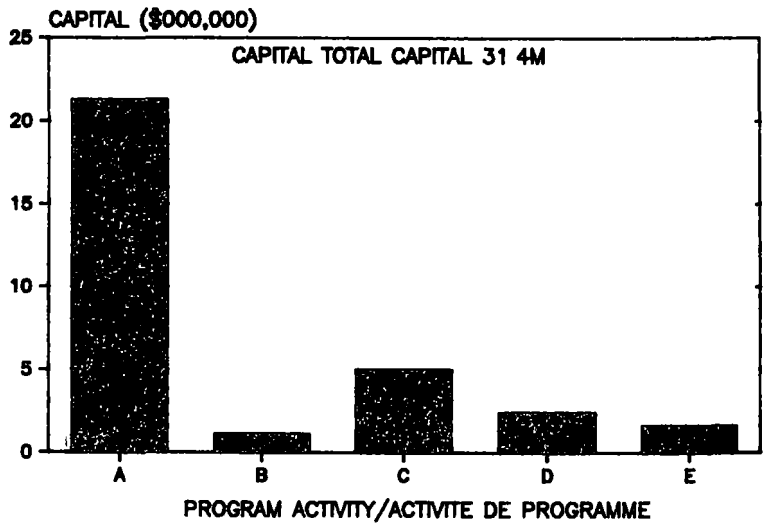
a) MARINE/MARITIMES b) ECONOMIC/ECONOMIQUE
c) CFWS/SMFC d) AVIATION
e) PUBLIC WEATHER SERVICES/SERVICES METEOROLOGIQUES AU PUBLIC
f) DATA/DONNEES
g) WEATHER SERVICES SUPPORT/SOUTIEN DES SERVICES METEOROLOGIQUES

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
1989 - 1990

4 1 5 SALARY AND O&M
SALAIRES ET FRAIS DE F&E



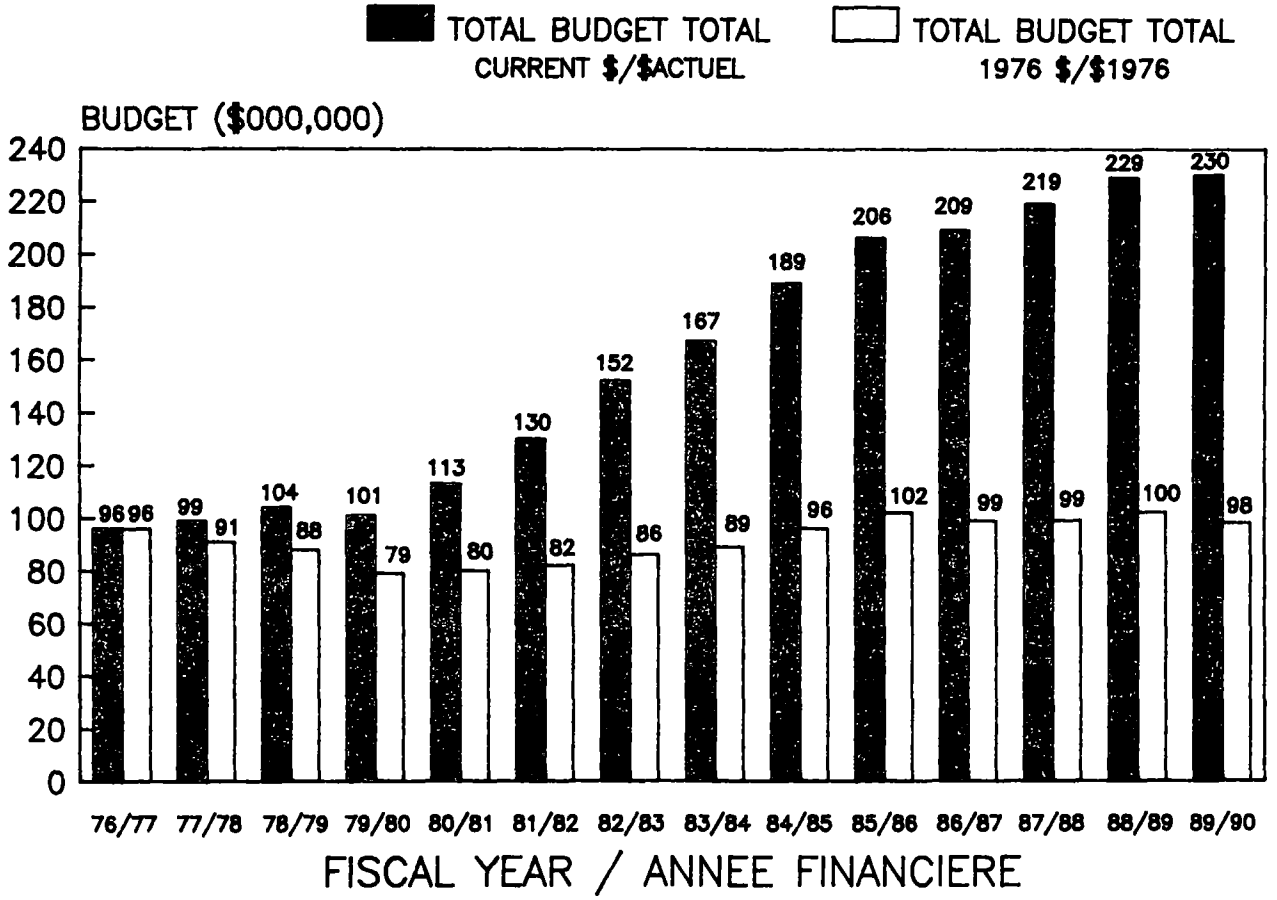
4 1 6 CAPITAL



A) WEATHER SERVICES
SERVICES METEOROLOGIQUES
B) CLIMATE SERVICES AND RESEARCH
SERVICES ET RECHERCHE CLIMATOLOGIQUE
C) ICE SERVICES/SERVICES DES GLACES
D) AIR QUALITY SERVICES & ATMOS RES
SERVICES RELATIFS A LA QUALITE DE L'AIR
ET RECHERCHE ATMOSPHERIQUE
E) MANAGEMENT & COMMON SUPPORT
SERVICES/SERVICES DE GESTION ET
DE SOUTIEN GENERAL

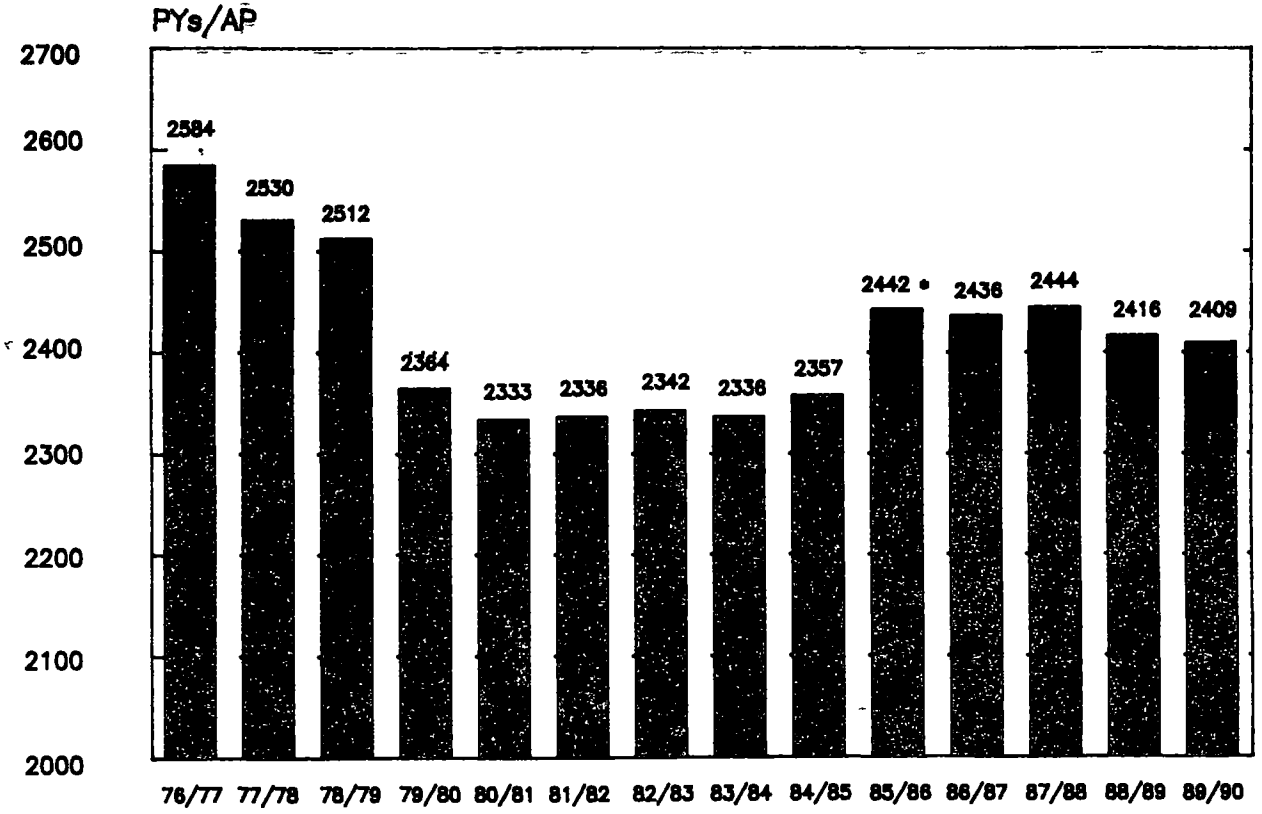
ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
1989 - 1990

4.1 7 BUDGETS 1976–1989



ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
1989 - 1990

4.1 8 PERSON YEARS/ANNEES-PERSONNES



* Personnel function transferred to AES
Fonction du personnel transferee au SEA

4 2 WEATHER SERVICES Sub-Activity (1873 0 PY, $164,471 1 K)

4 2 1 Objectives WEATHER SERVICES

- to provide present and predicted weather and marine data and advice for the safety of Canadians, the security of their property, the support of economic activities and the protection of environmental quality in Canada, and
- to acquire the basic understanding of atmospheric properties and behaviour needed to maintain and enhance such services

4 2 2 Budget· WEATHER SERVICES 1989-90 Budget by Sub-Sub-Activity (SA 2)

For further details on the Weather Services 1989-90 Budget by Sub-Sub-Activity refer to p 20, chart 4 1 2

4 2 3 Description WEATHER SERVICES

4 2 3 1 Public, Marine, Aviation, Economic and Canadian Forces Weather Service Sub-Sub-Activities (744 3 PY, $39,608 8 K)

The functions of these sub-sub-activities include the commitment to provide information, on a 24 hour per day basis on current and predicted weather for all land areas of Canada and the adjacent waters The information provided includes weather warnings, forecasts, and sea state conditions for the Atlantic and Pacific Oceans, particularly within the 200 mile economic zone When compiled, the information is offered to the public and to users in marine transportation, aviation, fishing, agriculture and forestry AES, in accordance with a Memorandum of Understanding, also provides support to the Department of National Defence to meet its meteorological and oceanographic service requirements

Across Canada, there are nine Weather Forecast Centres which are supported by the Canadian Meteorological Centre in Montreal These offices carry out analysis and prediction activities and then prepare the warnings, forecasts and other bulletins for users in their respective geographical areas There are another 63 smaller Weather Offices located across Canada which serve as distribution and consultation points for the forecasts and warnings issued by the Weather Forecast Centres Weather information can be obtained through telephone, automatic telephone answering devices, Weatheradio Canada, (see pages 41 and 42) broadcasts on local radio and television, Coast Guard marine radio and aviation radio The number of contacts/requests by users is displayed on page 27

The forecast service provided varies according to the needs of the user The chart "Weather Forecast Centres/Weather Offices" on page 28 identifies each Centre and Office The forecast service to the public includes emphasis on temperature and precipitation and the provision of warnings of extreme weather events Marine forecast services are concerned with wind, sea-state, visibility and freezing spray Services to aviation include weather conditions at airports, and significant en route icing, turbulence, winds and temperatures at flight levels Services to the agricultural sector and forestry industry are directed toward the provision of guidance on the occurence of frost, the timing of crop spraying and the severity of forest fire hazard The Weather Centres and Offices and regional Scientific Services Divisions support air quality and climate services, as well as environmental assessment programs of the Department

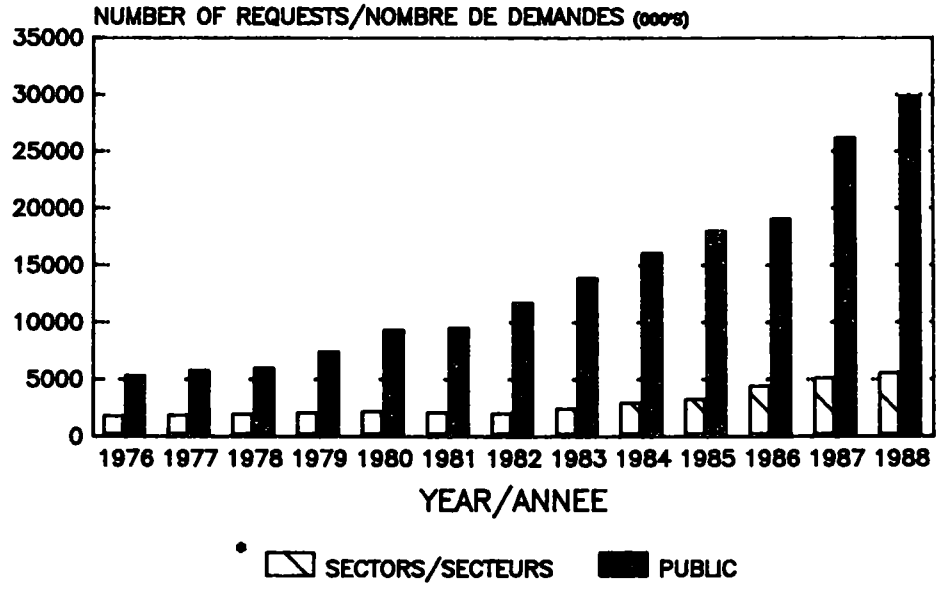
Maps which present the geographical coverage of forecasts for Canada and adjacent waters are located as follows

1) Public forecast regions - pages 43 - 44,
2) Airport forecast locations - page 45,
3) Aviation weather forecast regions - pages 46 - 49

AES is developing an implementation plan as a first step in achieving the long-term strategic direction of its Strategic Plan The plan addresses the provision of improved services within current resources and will be consistent with the Minister's direction on level of service that should be provided at the taxpayer's expense Priority improvements will be directed towards better public and marine forecast and warning services for the safety of Canadians, and be achieved through re-allocation of savings from automation, the astute use of human resources, and other productivity improvements

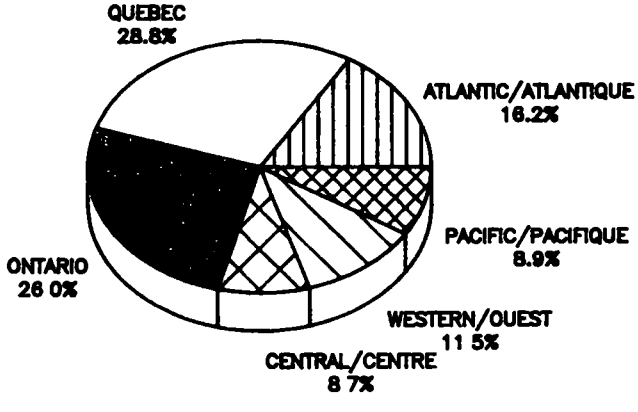
ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
1989 - 1990

WEATHER SERVICES CONTACTS
CONTACTS DES SERVICES METEOROLOGIQUES



• (ECONOMIC, TRANSPORTATION ETC)
(ECONOMIQUES, TRANSPORTS ETC)

WEATHER SERVICES CONTACTS
CONTACTS DES SERVICES METEOROLOGIQUES
BY REGION FOR 1988 / PAR REGION POUR 1988



WEATHER FORECAST CENTRES/WEATHER OFFICES 1989/90

REGION	PACIFIC	WESTERN	CENTRAL	ONTARIO	QUEBEC	ATLANTIC
TYPE						
AES Weather Forecast Centres 9	Pacific Weather Centre, Vancouver	Alberta Weather Centre, Edmonton Arctic Weather Centre, Edmonton Yukon Weather Centre, Whitehorse	Prairie Weather Centre, Winnipeg	Ontario Weather Centre, Toronto	Quebec Weather Centre, Montreal	Maritimes Weather Centre, Halifax Newfoundland Weather Centre Gander
WO with Prof Consult 4	Victoria	Yellowknife	Regina Saskatoon			
Weather Offices 59	Castlegar Kamloops Kelowna Penticton Port Hardy Prince George Terrace Vancouver Fort St John Fort Nelson	Calgary Edmonton Int'l Airport Edmonton Municipal Airport Grande Prairie Inuvik Lethbridge Banff Edmonton Whitehorse	Brandon Churchill Dauphin Prince Albert Resolute Thompson Winnipeg Int'l Airport	Hamilton Kingston London St Catherines North Bay Ottawa Peterborough Sarnia Sault Ste Marie Sudbury Thunder Bay Toronto Waterloo-Wellington Windsor	Frobisher Montreal/ Mirabel Montreal/ Dorval Quebec Sept-Iles Sherbrooke St Hubert Trois Rivieres Val D'Or	Charlottetown Fredericton Halifax Int'l Airport Moncton Saint John St John's Sydney Gander Halifax/ Dartmouth Yarmouth
Canadian Forces Forecast Centres 3		Edmonton		Trenton		Halifax
Canadian Forces Weather Office 17	Comox Exquimalt	Cold Lake	Moose Jaw Portage la Prairie Winnipeg	North Bay Ottawa Petawawa	Bagotville St Hubert	Chatham Gagetown Greenwood Shearwater Summerside Goose Bay
TOTAL 92	14	15	13	19	12	19

4 2 3 2 Data Sub-Sub-Activity (457 0 PY, $45,373 9 K)

Data are gathered in Canada, in Canadian air-space and adjacent waters for weather, climate and research services Outlined below are the various data gathered and the number of stations and locations involved

1) Surface weather observations are taken at 307 AES and 145 Other Government Department (OGD) weather observation stations Included in the above, there are 138 and 10 OGD automatic stations respectively AES also has 31 buoys strategically located in Canadian waters and on the ice in the Arctic Ocean to provide weather data The above are supplemented by voluntary observation programs undertaken by 475 ships operating on the Great Lakes and in the Atlantic, Pacific and Arctic Oceans,

2) Thirty-two Upper Air Stations measure temperature, pressure, relative humidity and wind velocity in the free atmosphere, from the surface to 35,000 metres In addition, AES operates an automated shipboard aerological program (upper air) on 3 volunteer commercial ships operating on the Pacific Ocean,

3) The above observations 1) and 2) are taken at regular intervals, are available in real-time and are used in the production of weather forecasts and weather warnings,

4) The position, and movement of severe storms and precipitation is provided by 14 AES weather radar stations,

5) Satellite imagery of North American and oceanic weather systems and ice conditions in Canadian waters is provided by 10 weather satellite readout stations,

6) Climatological data are gathered by a network of 223 AES and 103 OGD synoptic weather stations and 2502 climatological stations run by volunteers,

7) Radioactive fallout is monitored at 22 AES and 3 OGD locations in Canada,

8) Observations of total ozone and the vertical distribution of ozone are taken at 6 locations in Canada, and

9) Other programs conducted at weather stations include
   i) seasonal freeze-up and break-up of water bodies, sunshine, soil temperatures and evaporation,
   ii) seismic observations of tectonic events at 4 locations for the Department of Energy, Mines and Resources,
   iii) air quality measurements are taken at 21 locations, and
   iv) solar radiation measurements are taken at 50 locations

AES DATA ACQUISITION STATIONS BY TYPE AND LOCATION

1989-90

TYPE	REGION								
	PACIFIC	WESTERN	CENTRAL	ONTARIO	QUEBEC	ATLANTIC	AES TOTAL	OGD+	TOTAL
Automatic Stations	21	28	22	31	15	21	138	10	148
Upper Air Stations	5*	6	9	2	6	4	32	1	33
Synoptic Stations	30	42	41	39	34	37	223	103	326
Buoys	16	9++	0	3	0	3	31	-	-
Climate Stations	536	515	449	355	366	281	2502	15	2517
Weather Radar Stations	0	2	3	6	1	2	14	-	-
Satellite Stations	1	4	1	2	1	1	10	-	-
Air Quality Stations	1	1	3	7	4	5	21	-	-
Solar Radiation Progam Locations	8	8	12	6	9	6	49	1	50
Seismic Program Locations	0	2	1	0	1	0	4	-	-
Radioactive Fallout Monitoring Program Locations	1	5	6	6	3	2	22	3	25
Ozone Program Locations	0	1	3	1**	0	-	5	1	6

* Includes automated shipboard aerological program
** AES Headquarters (Downsview, Ontario)
\+ Other Government Departments
++ Includes ice buoys

4 2 3 3 Weather Services Support Systems Sub-Sub-Activity
(692 2 PY, $76,179 9 K)

This sub-sub-activity provides support services necessary for the efficient functioning of a modern weather service Some of these services are described below

1) The Canadian Meteorological Centre (CMC), in Montreal, uses very powerful computers and mathematical models of the atmosphere to create meteorological forecasts for periods of up to five days in advance These forecasts are used as guidance by the Weather Forecast Centres and Weather Offices,

2) Research is conducted in both Downsview and Montreal in order to improve the forecast service and related data acquisition and processing activities in support of regional and local forecasting It is concentrated on the development of computer models to predict the dynamic parameters of the atmosphere These models assist in the development of forecasting techniques and methods In the Arctic and offshore areas, emphasis is given to atmosphere-related predictions, such as for waves and ice As well, meteorological satellite and weather radar research and development is being carried out A significant challenge for the future lies in the integration of satellite and radar data into the computer models, and their direct application to short-range severe storm forecasting Other research activities include the development of a forecaster's workstation and an automated forecast verification system,

3) The AES Communications System is required for the rapid collection and dissemination of national/international data and information The system includes national teletype, paper facsimile and photo facsimile networks A major 6-year project to upgrade the system is nearing completion,

4) The Training Branch develops and conducts advanced and refresher training courses in both official languages for professional meteorologists and technicians at training facilities in Downsview, Montreal, Cornwall and at major weather offices across the country This Branch also has ongoing development programs in co-operation with Canadian universities to encourage university physics graduates to study meteorology through a one-year diploma course, and

5) The Data Acquisition Systems Branch of the Central Services Directorate develops, designs and evaluates meteorological instruments to determine the optimum instrumentation required for the Weather Services sub-activity It is also responsible for the procurement, testing, installation and maintenance of field instruments

4 3 CLIMATE SERVICES AND RESEARCH Sub-Activity (225 5 PY, $17,749 9 K)

4 3 1 Objectives CLIMATE SERVICES AND RESEARCH

- to provide data information and advice to government and others on the climate of the atmosphere and its interface with land and sea, and to support Environment Canada's mandate in respect of the safety of life and property and enhancement and protection of the environment by

    1) acting as the lead agency for the Canadian Climate Program,
    2) encouraging the private sector to provide consultation services in the application of climate information to climate sensitive industries,
    3) undertaking research to improve knowledge of climate as a physical system, developing improved systems for monitoring current climate across Canada and developing appropriate policy options,
    4) assessing the predictability of the atmosphere on monthly and seasonal scales using statistical and numerical techniques,
    5) improving the monitoring of atmospheric carbon dioxide and other radiatively active gases and promoting the study of the long term impacts of climate change on major economic sectors in Canada, and
    6) improving the national climate information base and its accessibility to users

- to contribute to better management of water resources by continuing a hydrometeorological research program at the National Hydrology Research Centre (NHRC) in Saskatoon on drought, evaporation, physical impacts of climatic variability/change and the applications of radar and satellite data to hydrology

4 3 2 Budget CLIMATE SERVICES AND RESEARCH 1989-90 AES Budget by Sub-Sub-Activity

For further details on the Climate Services and Research 1989-90 AES Budget by Sub-Sub Activity, refer to p 20, chart 4 1 2

4 3 3 Description CLIMATE SERVICES AND RESEARCH

The Canadian Climate Centre, located in Downsview, processes about 13,000 climate inquiries per year The Centre deals with requests which are national in scope and assists the regional offices in answering their inquiries as required The following table displays the total number of AES climate service contacts per year since 1977 The majority of these inquiries are received and processed at local and regional offices across Canada (i e Weather Services Directorate)

Recently observed weather data from a federal climate network of about 2,800 stations is available This network will be maintained and operated according to established standards to ensure the collection, quality control and accessibility of the data

AES CLIMATE SERVICE CONTACTS
(000's)

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
WEATHER SERVICES DIRECTORATE	178	173	179	204	254	316	218	195	224	301
CANADIAN CLIMATE CENTRE	15	15	15	15	15	15	14	15	13	13
TOTAL	193	188	194	219	269	331	232	210	237	314

Over 120 million data entries of meteorological, air quality, sea-state and ice information are maintained in a national archive The archive contains data necessary to describe Canada's climate in accordance with World Meteorological Organization standards It is planned to contain data not only from the federal network but also from provincial and other agencies The archive includes summarized and derived data, including normals, extremes, frequencies and durations for various time scales

Statistical summaries defining the climate of Canada and climatological data, studies and analyses in standard generalized form have been published Information in the form of storm analyses, national and regional climate maps and statistics and studies of climate relating to various economic sectors is available Guides and handbooks on hydrometeorological and climatological practices are maintained

Experimental monthly and seasonal forecasts are under development Following evaluation, the monthly temperature forecasts are now being made public

National and regional climatic trends and anomalies are monitored and predicted The build-up of carbon dioxide and radiatively active gases are monitored and reported annually The effects on our climate of the build-up are being defined and studied

Research and development is carried out to support the climate service program, to increase our understanding of the climate as a physical system and to provide a sound basis for assessing and determining the responses of the climate to natural changes and human activities

4 4 ICE SERVICES Sub-Activity (69 5 PY, $24,418 6 K)

4 4 1 Objectives ICE SERVICES

- to provide ice information (analysis, prognostic and warnings) for the safety of Canadians involved in fishing, marine transportation and offshore petroleum exploration, and for the protection of life and property such as ships and drilling platforms, and
- to protect the quality of the maritime environment by supporting the prevention of environmental disasters

4 4 2 Budget ICE SERVICES 1989-90 Budget by Sub-Sub-Activity (SA 2)

For further details on Ice Services 1989-90 Budget by Sub-Sub-Activity, refer to p 20, chart 4 1 2

4 4 3 Description ICE SERVICES

This sub-activity·

i) operates, develops and maintains acquisition systems for ice data,
ii) provides forecasts of ice formation, growth, deterioration and movement in Canada's major rivers, lakes and adjacent waters These activities are in support of the Canadian Coast Guard, and offshore development and fishing industries, Canada Oil and Gas Lands Administration, the commercial shipping transportation industries and the public, and
iii) includes ice research to develop remote sensing and improved ice forecast capabilities

Ice Observations

Ice observation programs are conducted from aircraft and ship and shore stations to support marine operations in the ice congested waters of Canada during the appropriate seasons Aerial ice reconnaissance is carried out every month of the year in one or more areas of the Eastern Canadian Seaboard, Canadian Arctic Waters, Hudson Bay, Hudson Strait and Inland Waterways Satellite observations are being integrated into the data acquisition system About 3000 analyses and "nowcasts" are prepared in chart form annually

Ice Forecasts

Ice and iceberg advisory and forecast services are provided from the AES Ice Centre in Ottawa Approximately 1500 short-range tactical forecasts and bulletins and about 30 longer-range strategic forecasts are provided annually for the following areas

- Gulf of St Lawrence,
- Coastal Waters of Newfoundland, and Hudson Bay and its approaches,
- Waters of the Canadian Arctic, including the Beaufort Sea,
- St Lawrence River Seaway and Great Lakes

Iceberg Advisories

The latest spatial distribution of icebergs off the East Coast along with information on iceberg drift is available on request

Ice and Iceberg Climatology

In response to about 2000 annual information requests, ice climatological services and information on ice climatology applications is provided to a wide variety of clients, including Canadian Coast Guard and Canada Oil and Gas Lands Administration (COGLA)

4 5 AIR QUALITY SERVICES AND ATMOSPHERIC RESEARCH Sub-Activity (115 0 PY, $14,522 8 K)

4 5 1 Objectives AIR QUALITY SERVICES AND ATMOSPHERIC RESEARCH

- to provide advice on air quality issues regionally and nationally as required, including to provincial agencies and to AES and DOE senior management,
- to develop the scientific knowledge and techniques required to determine how pollutant emissions are transported and deposited to receptors by the atmosphere, and
- to develop improved knowledge of the processes related to stratospheric pollution and atmospheric radiation, and provide long term measurements of the stratospheric ozone layer

4 5 2 Budget AIR QUALITY SERVICES AND ATMOSPHERIC RESEARCH 1989-90 AES Budget by Sub-Sub-Activity (SA 2)

For further details on Air Quality Services and Atmospheric Research 1989-90 by Sub-Sub-Activity, refer to p 20, chart 4 1 2

4 5 3 Description AIR QUALITY SERVICES AND ATMOSPHERIC RESEARCH

This sub-activity provides

1) air quality services such as advice and support for response to environmental emergencies, and assistance to Regions and others in conducting environmental impact assessments,
2) strategic research in support of air quality issues,
3) long-term measurement as well as research in support of the Long Range Transport of Air Pollutants Program (LRTAP),
4) research on the atmospheric component of the Toxic chemicals problem, including support required under Annex 15 of the Canada-U S Great Lakes Water Quality Agreement (GLWQA),
5) long-term measurements and research related to the surveillance, understanding and prediction of stratospheric pollution, the ozone layer and atmospheric radiation, and
6) co-ordination of the national scientific program on acid rain

4 6 SECRETARIAT FOR THE CHANGING ATMOSPHERE (8 0 PY, $766 0 K)

There has been a dramatic increase in the public awareness and concern for environmental problems associated with the changing chemical composition of the atmosphere The Changing Atmosphere Conference in Toronto, in June 1988, served as a major international focus on the current status of the science of the greenhouse effect, stratospheric ozone depletion, and acid rain The conference, through major coverage by the media, also served to raise the public understanding of these issues

Although all three issues have been under study by federal agencies for more than a decade, there is a need to strengthen and expand AES efforts to resolve these problems and to deal with them in a more holistic and coordinated way Thus, the Secretariat for the Changing Atmosphere is being established in 1989

AES is doing this by building on the LRTAP Liaison Office which has been concentrating on the acid rain issue for many years While maintaining the full role of coordinating federal and provincial research projects on acid rain, the Secretariat will be expanding its coordinating activity to include other programs and committees such as the Intergovernmental Panel on Climate Change and its infrastructure

Long Range Transport of Air Pollutants (LRTAP)

The LRTAP program was established within Environment Canada to co-ordinate and evaluate the federal research and monitoring effort and to provide air quality monitoring data and atmospheric processes and transport information required to reduce damaging pollution from the long-range transport of airborne pollutants to environmentally acceptable levels Activities in the Department, underway since 1976, continue to form the basis for the implementation of control strategies negotiated with eastern provinces and to support the negotiation of a bilateral emission reduction agreement with the United States AES is responsible for the co-ordination and provision of the information on the atmosphere to elected officials, the media and the general public

AES maintains and is currently upgrading a national sampling network to monitor the atmospheric concentration and deposition of sulphur, nitrogen and other compounds with special emphasis on acidic precipitation This includes the operation of the Canadian Air and Precipitation Monitoring network (CAPMoN) for sampling precipitation on a daily basis This network, displayed on page 55 consists of 21 stations monitoring precipation Nine of these stations also sample air daily Extensive research is carried out by AES to improve the knowledge of physical and chemical processes involving LRTAP and to develop predictive models of the long-range transport, transformation and deposition of air pollutants The atmospheric LRTAP initiative, to a large extent, is directly supported by the A-Base sub-activity (6000) of Air Quality Services and Atmospheric Research

Great Lakes Water Quality

The Great Lakes Water Quality Program has been designed to provide the information necessary to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin ecosystem The objectives of the program are to provide environmental data for a better understanding of the Great Lakes Basin ecosystem and to develop measures to reduce the discharge of pollutants into the Great Lakes system

The national program is led by Environment Canada's Ontario Region which chairs an interdepartmental committee The AES component is concerned with estimating the atmospheric input of certain nutrients, heavy metals and organic contaminants to the Great Lakes and with examining the relative importance of various sources through modelling under the Great Lakes Water Quality Act (GLWQA) Annex 15.

4 7 MANAGEMENT AND COMMON SUPPORT SERVICES Sub-Activity (126 0 PY, $9,018 6 K)

4 7 1 Objectives MANAGEMENT AND COMMON SUPPORT SERVICES

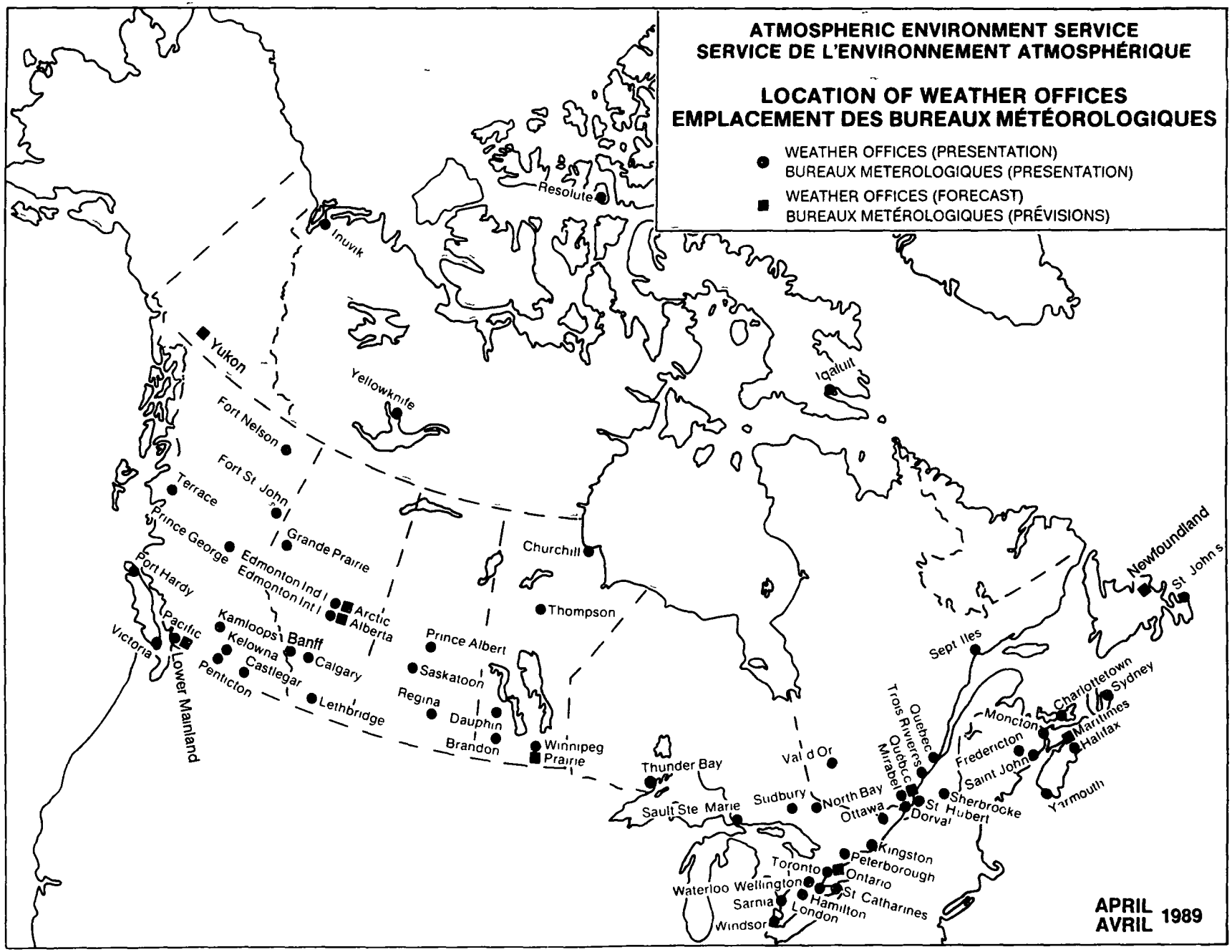
- to provide continuous policy guidance and leadership for the service including the establishment of objectives, goals and priorities,
- to provide management and administrative support to the Atmospheric Environment Service in the area of financial management, human resources management, management information systems, materiel management, policy and planning, facilities management, office services, health and safety, library services, official languages, and affirmative action,
- to co-ordinate participation in international programs in accordance with Canada's commitment to the World Meteorological Organization, and to contribute to the development of the AES scientific and technological base, and
- to promote the science and public awareness of meteorology and other environmental disciplines in Canada by
  - i) supporting organizations concerned with the advancement of meteorology and other environmental disciplines,
  - ii) supporting meteorological and other environmental research in Canadian universities, and
  - iii) encouraging the development of meteorological and other environmental services in the private sector within Canada

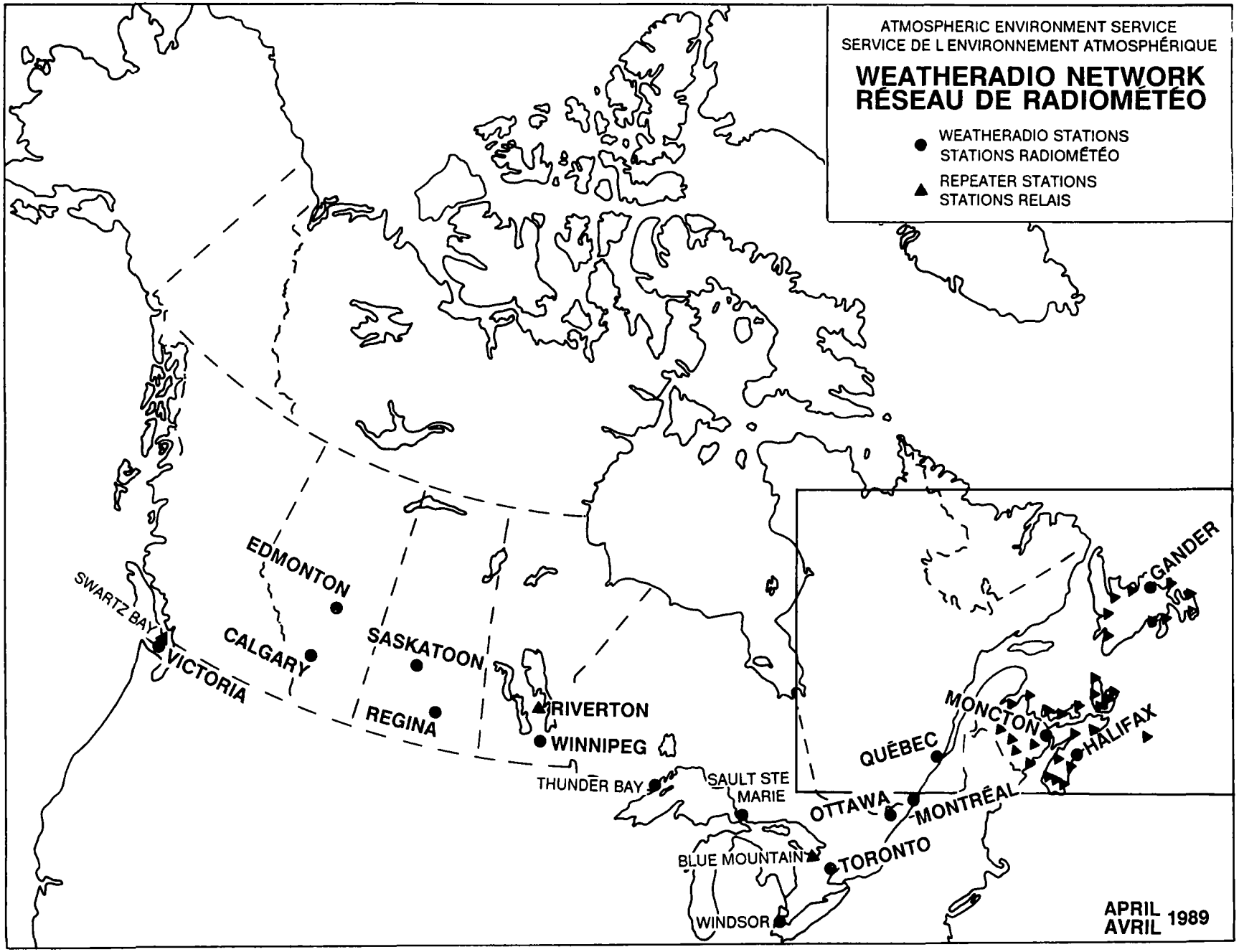
4 7 2 Budget MANAGEMENT AND COMMON SUPPORT SERVICES 1989-90 Budget by Sub-Sub-Activity (SA 2)

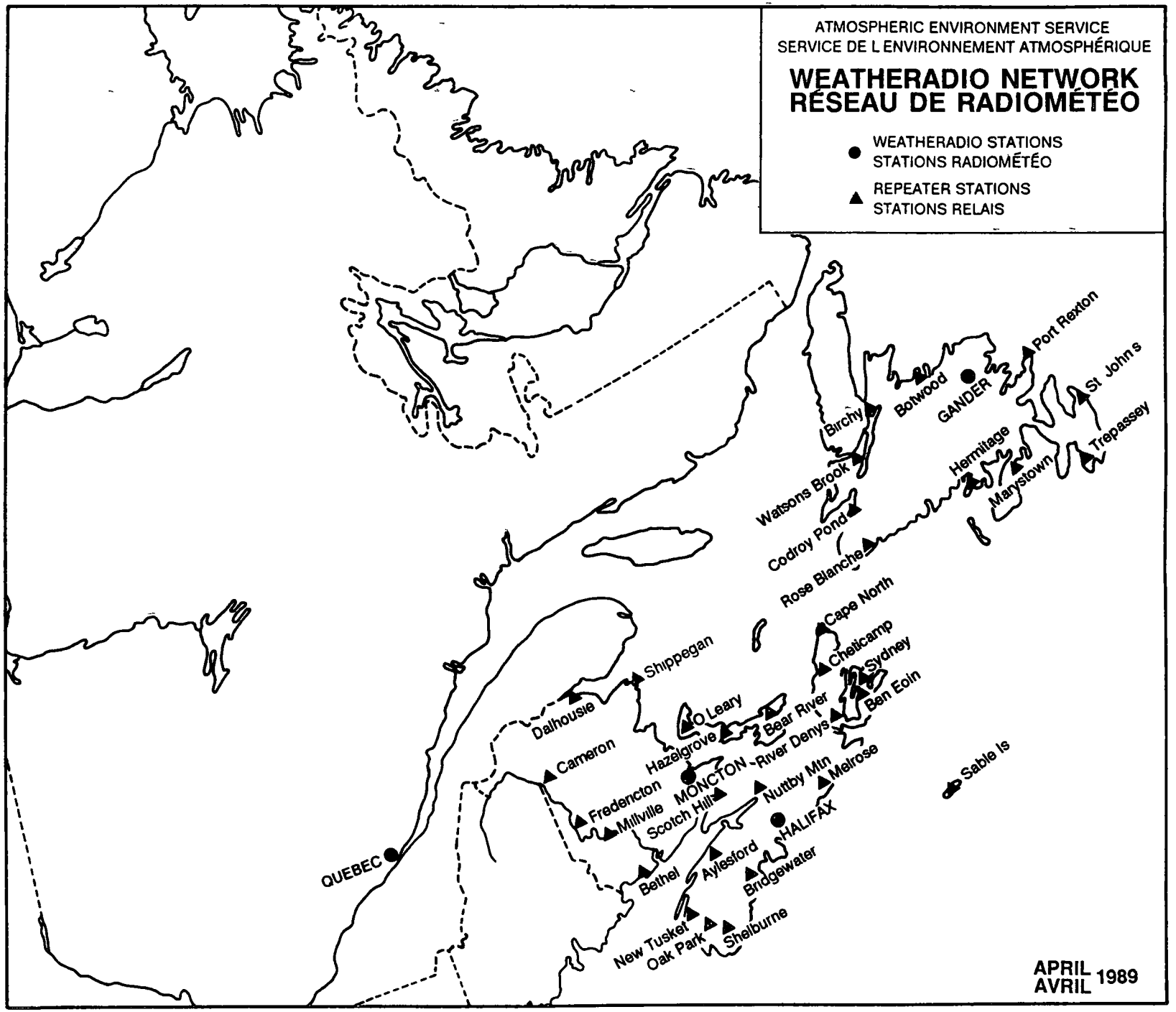
For further details on Management and Common Support Services 1989-90 Budget by Sub-Sub-Activity, refer to p 20, Chart 4 1 2

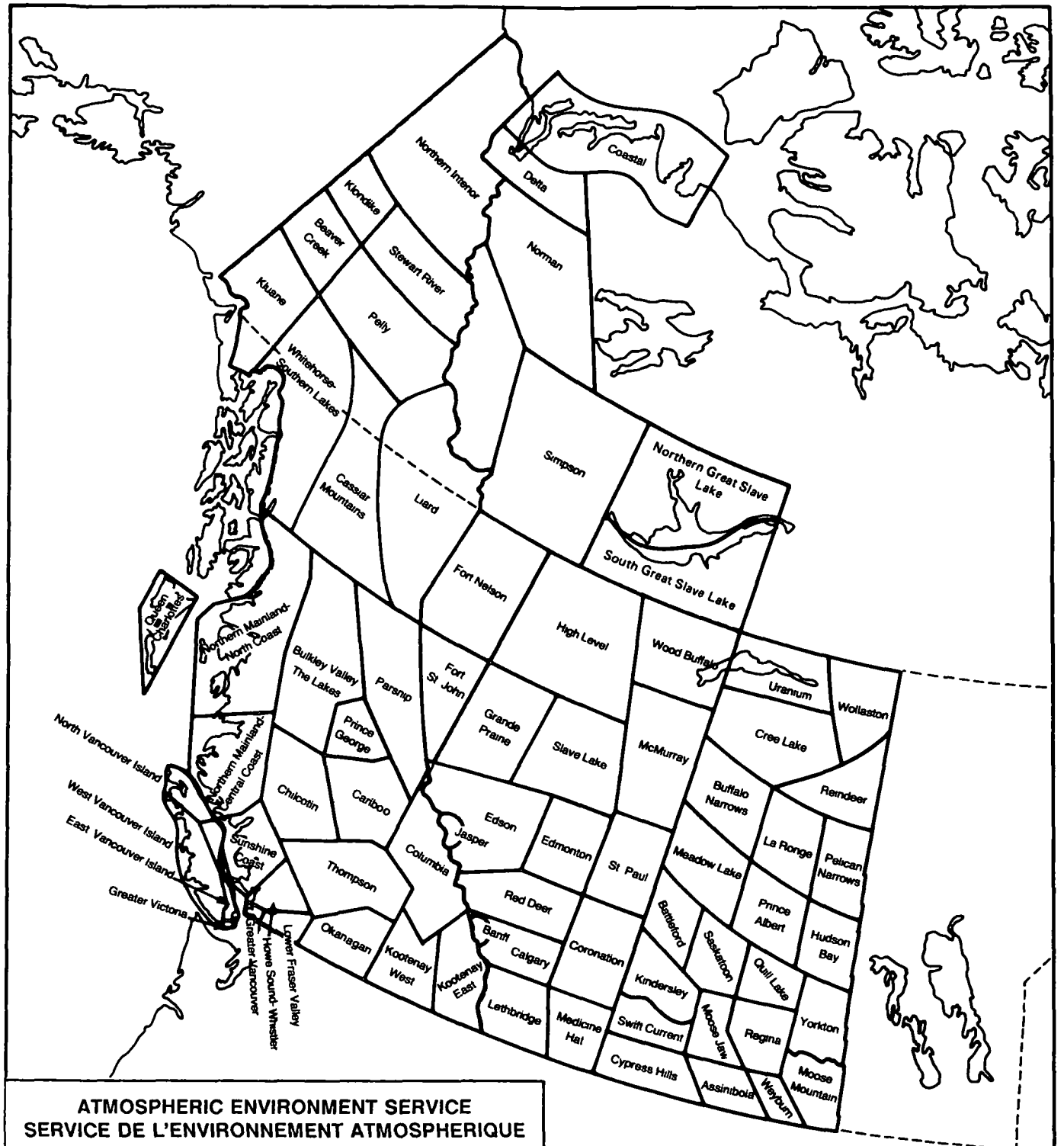
4 7 3 Description MANAGEMENT AND COMMON SUPPORT SERVICES

This sub-activity includes the executive direction of the AES, the management function related to the development and maintenance of overall goals and objectives for the AES, policies, and program development and evaluation, information services, and participation in international meteorological affairs This also includes those common services which support AES in areas of administration, personnel, facilities, library, materiel, health and safety and financial management


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHÉRIQUE
LOCATION OF WEATHER OFFICES
EMPLACEMENT DES BUREAUX MÉTÉOROLOGIQUES
WEATHER OFFICES (PRESENTATION)
BUREAUX METEROLOGIQUES (PRESENTATION)
WEATHER OFFICES (FORECAST)
BUREAUX METÉROLOGIQUES (PRÉVISIONS)
Resolute
Inuvik
Yukon
Yellowknife
Iqaluit
Fort Nelson
Fort St John
Terrace
Prince George
Grande Prairie
Churchill
Edmonton Ind
Edmonton Int l
Arctic
Alberta
Fort Hardy
Thompson
Kamloops
Kelowna
Banff
Calgary
Pacific
Victoria
Lower Mainland
Castlegar
Penticton
Lethbridge
Prince Albert
Saskatoon
Regina
Dauphin
Brandon
Winnipeg
Prairie
Thunder Bay
Val d Or
Sept Iles
Newfoundland
St John s
Trois Rivers
Quebec
Quebec
Mirabel
Moncton
Charlottetown
Sydney
Maritimes
Halifax
Fredericton
Saint John
Yarmouth
Sherbrooke
Sudbury
North Bay
Ottawa
St Hubert
Dorval
Sault Ste Marie
Kingston
Peterborough
Toronto
Ontario
Waterloo
Wellington
St Catharines
Sarnia
Hamilton
London
Windsor
APRIL 1989
AVRIL


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHÉRIQUE
WEATHERADIO NETWORK
RÉSEAU DE RADIOMÉTÉO
WEATHERADIO STATIONS
STATIONS RADIOMÉTÉO
REPEATER STATIONS
STATIONS RELAIS
SWARTZ BAY
VICTORIA
EDMONTON
CALGARY
SASKATOON
REGINA
RIVERTON
WINNIPEG
THUNDER BAY
SAULT STE MARIE
BLUE MOUNTAIN
WINDSOR
TORONTO
OTTAWA
MONTRÉAL
QUÉBEC
MONCTON
HALIFAX
GANDER
APRIL
AVRIL 1989


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHÉRIQUE
WEATHERADIO NETWORK
RÉSEAU DE RADIOMÉTÉO
WEATHERADIO STATIONS
STATIONS RADIOMÉTÉO
REPEATER STATIONS
STATIONS RELAIS
Port Rexton
St John's
Botwood
GANDER
Birchy
Hermitage
Trepassey
Marystown
Watsons Brook
Codroy Pond
Rose Blanche
Cape North
Cheticamp
Sydney
Ben Eoin
Shippegan
Dalhousie
O Leary
Bear River
River Denys
Cameron
Hazelgrove
Fredericton
Millville
MONCTON
Scotch Hill
Nuttby Mtn
Melrose
Sable Is
HALIFAX
QUEBEC
Bethel
Aylesford
Bridgewater
New Tusket
Oak Park
Shelburne
APRIL
AVRIL 1989



ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE

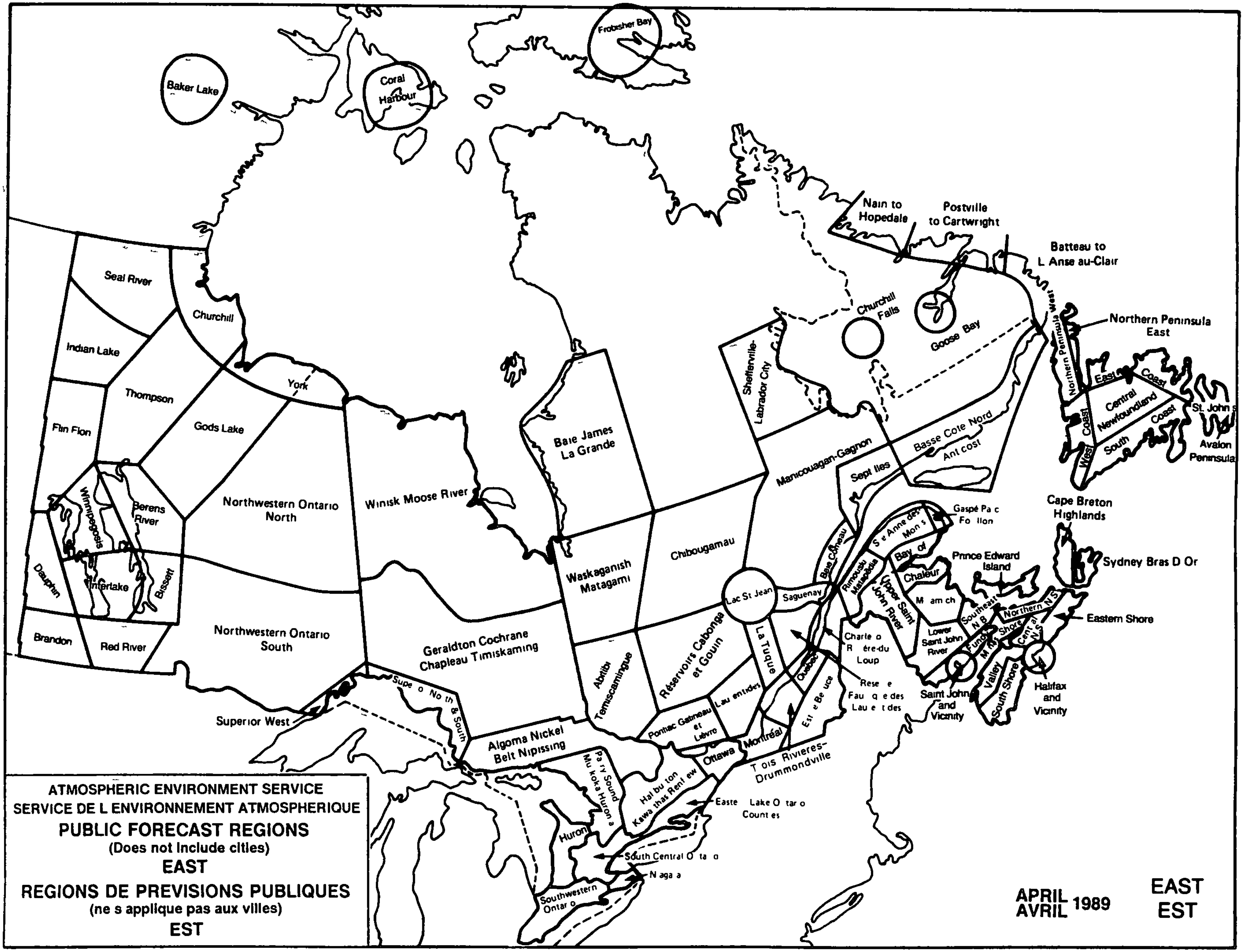
PUBLIC FORECAST REGIONS
(Does not include cities)

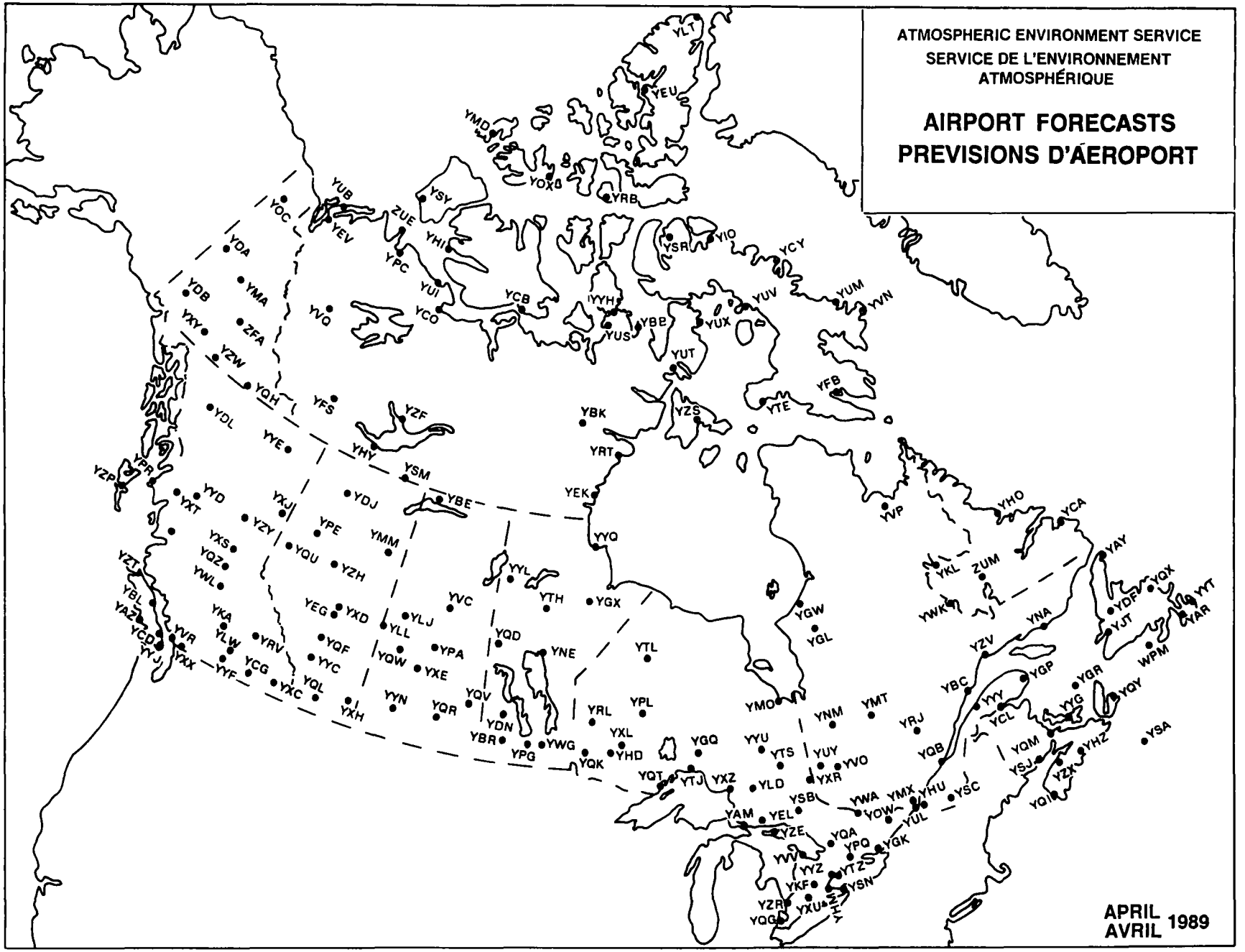
WEST

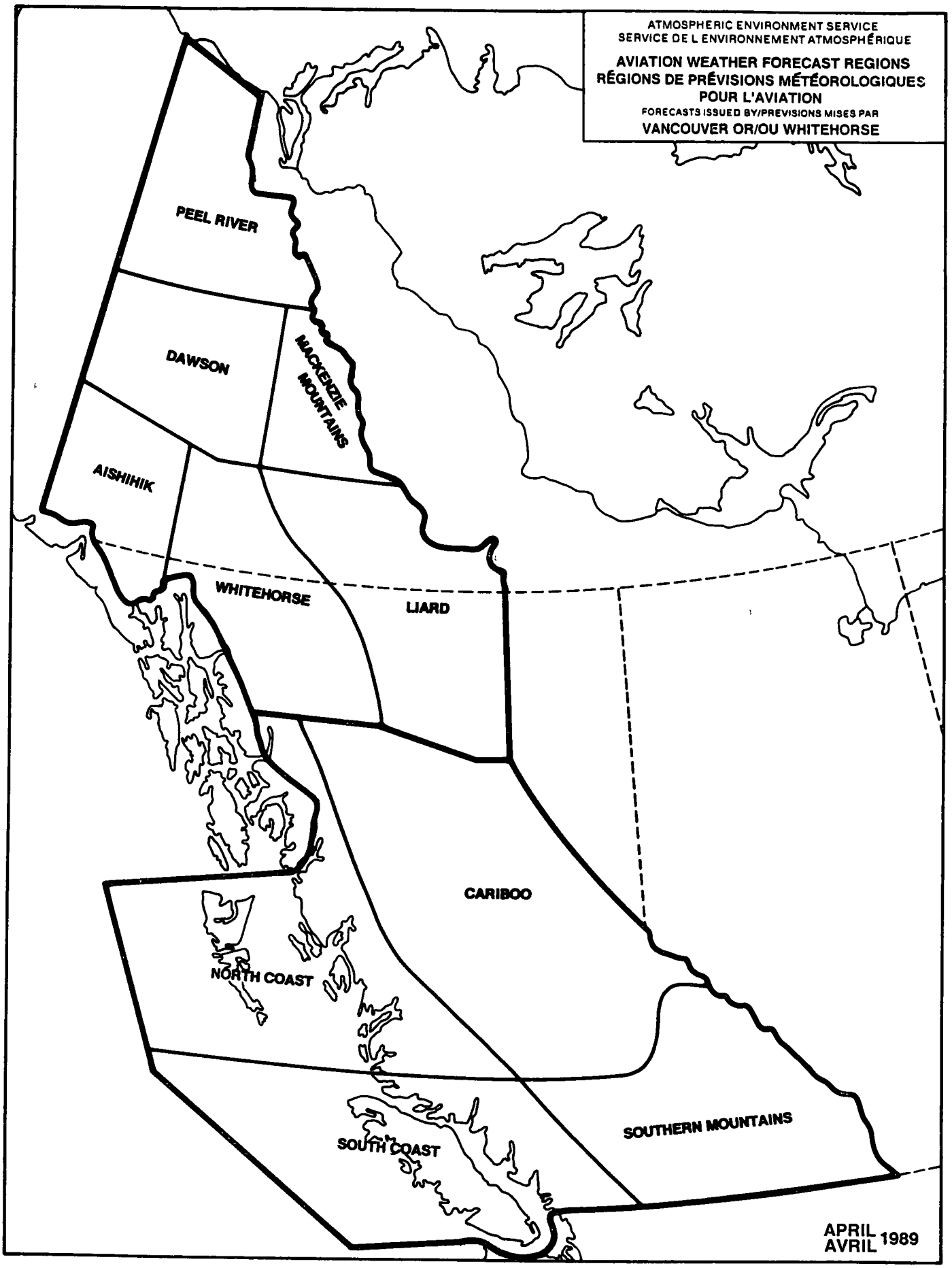
RÉGIONS DE PRÉVISIONS PUBLIQUES
(ne s'applique pas aux villes)

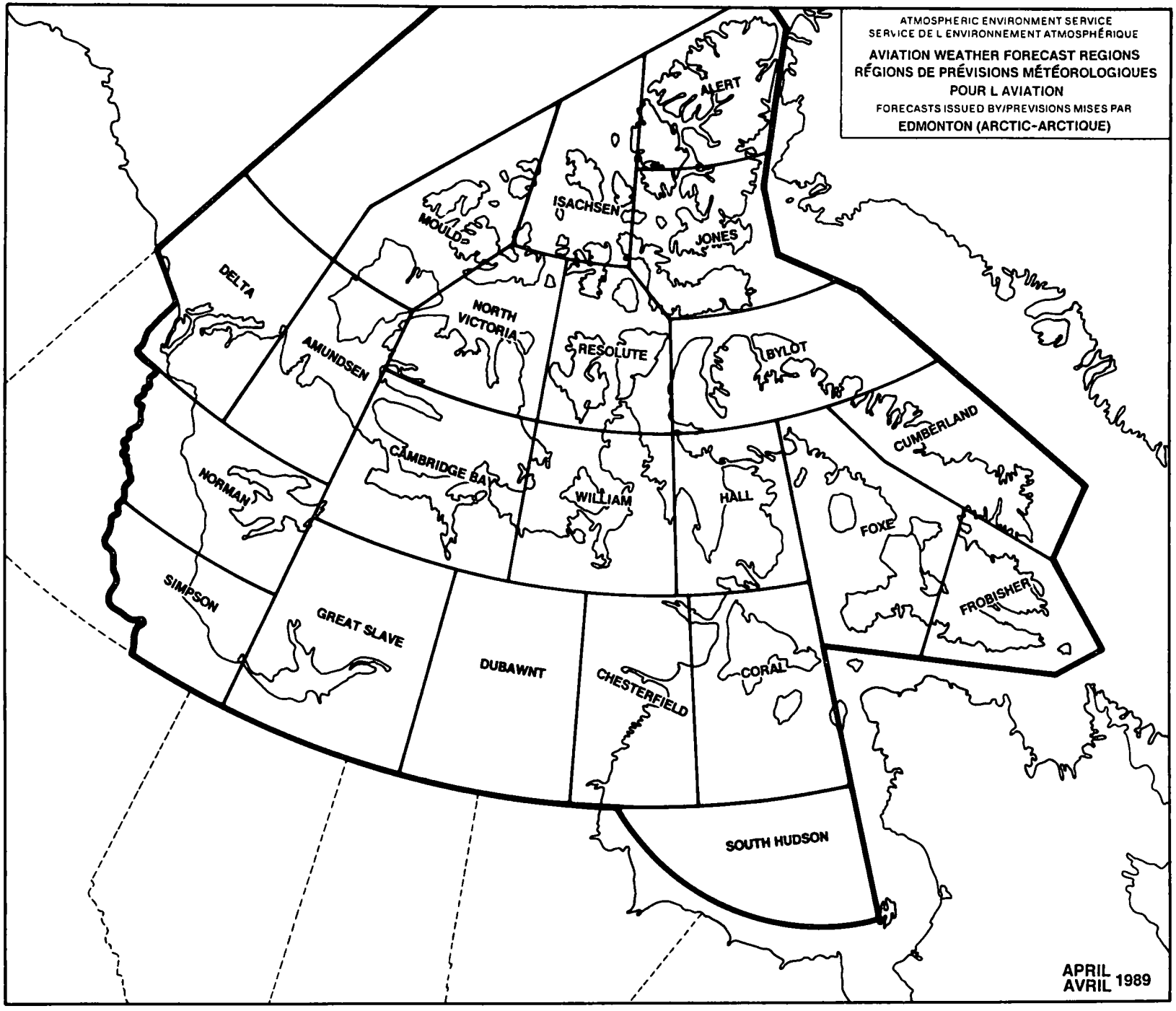
OUEST

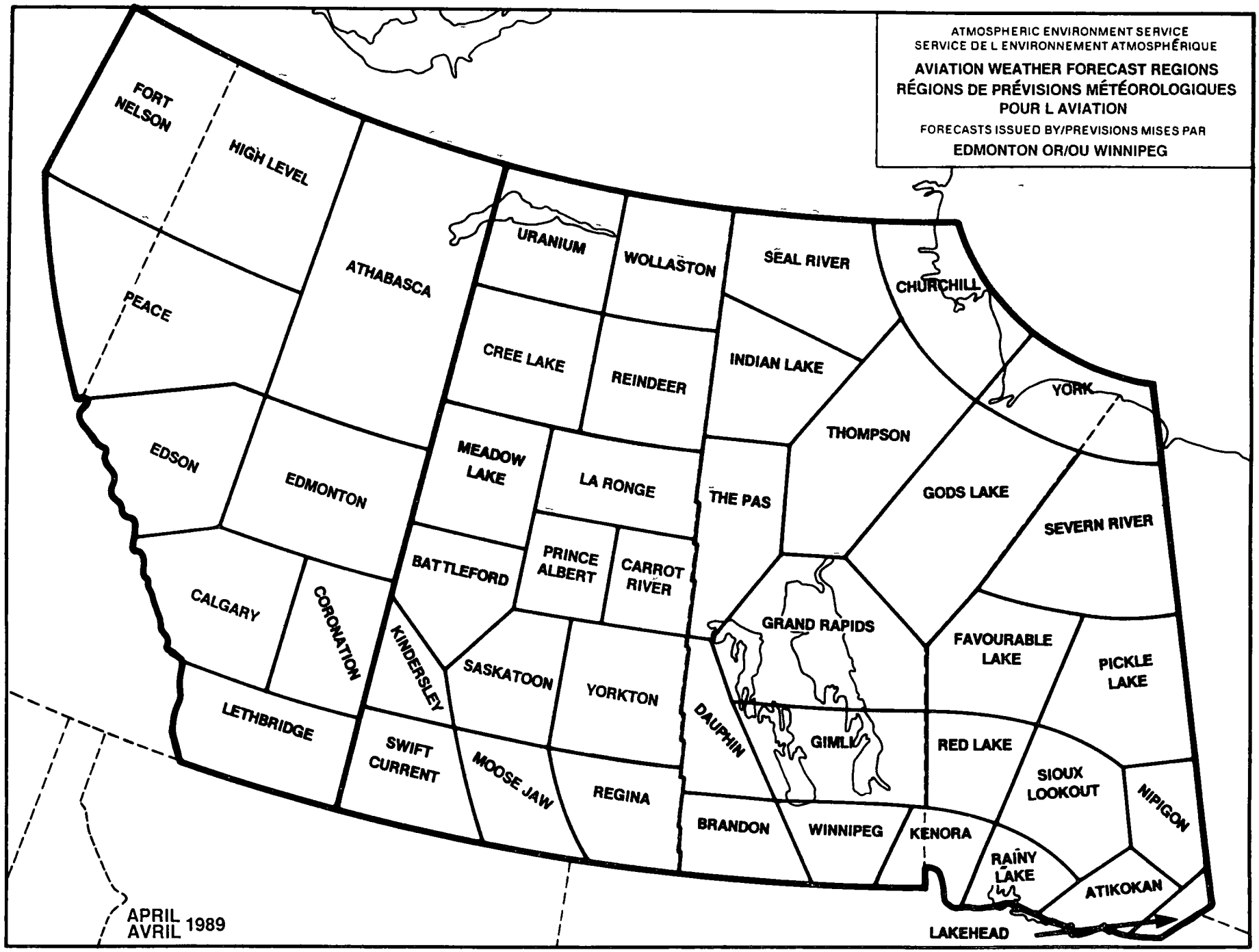
APRIL
AVRIL 1989

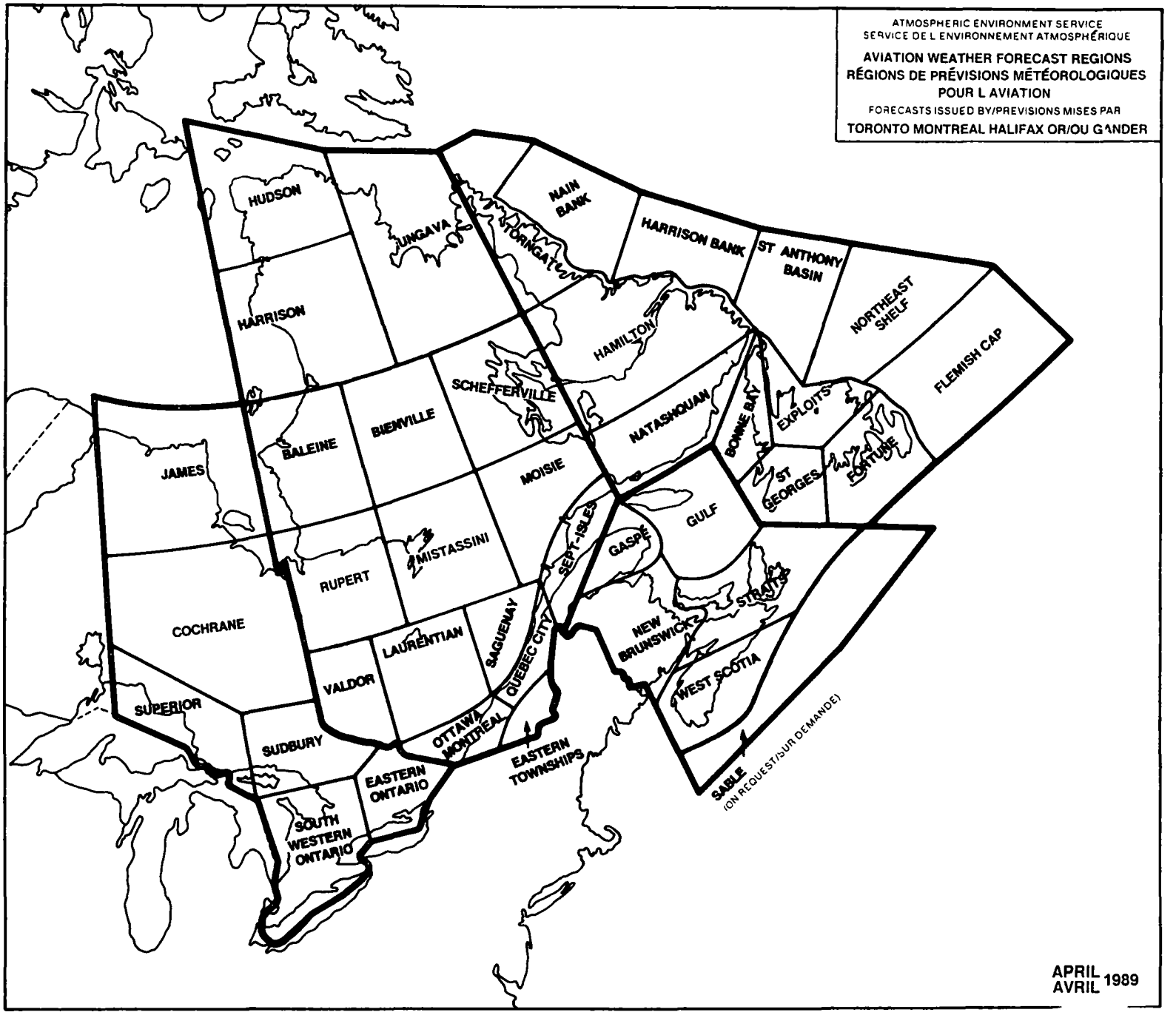

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHERIQUE
PUBLIC FORECAST REGIONS
(Does not include cities)
EAST
REGIONS DE PREVISIONS PUBLIQUES
(ne s applique pas aux villes)
EST
APRIL
AVRIL 1989
EAST
EST
Baker Lake
Coral Harbour
Frobisher Bay
Seal River
Churchill
Indian Lake
Thompson
York
Flin Flon
Gods Lake
Winnipegosis
Berens River
Northwestern Ontario North
Winisk Moose River
Baie James La Grande
Dauphin
Interlake
Bissett
Brandon
Red River
Northwestern Ontario South
Geraldton Cochrane Chapleau Timiskaming
Waskaganish Matagami
Chibougamau
Superior West
Algoma Nickel Belt Nipissing
Abitibi Temiscamingue
Réservoirs Cabonga et Gouin
La Tuque
Lac St Jean
Saguenay
Pontiac Gatineau et Lièvre
Ottawa
Montréal
Huron
Southwestern Ontario
Schefferville-Labrador City
Manicouagan-Gagnon
Churchill Falls
Goose Bay
Nain to Hopedale
Postville to Cartwright
Batteau to L Anse au-Clair
Northern Peninsula East
Northern Peninsula West
Central Newfoundland
St. Johns
Avalon Peninsula
Sept Iles
Basse Cote Nord
Anticosti
Cape Breton Highlands
Sydney Bras D Or
Prince Edward Island
Bay of Chaleur
Eastern Shore
Halifax and Vicinity
Saint John and Vicinity
Valley
South Shore
Lower Saint John River
Upper Saint John River
Southeast N.B.
Northern N.S.
Central N.S.
Fundy
Gaspé

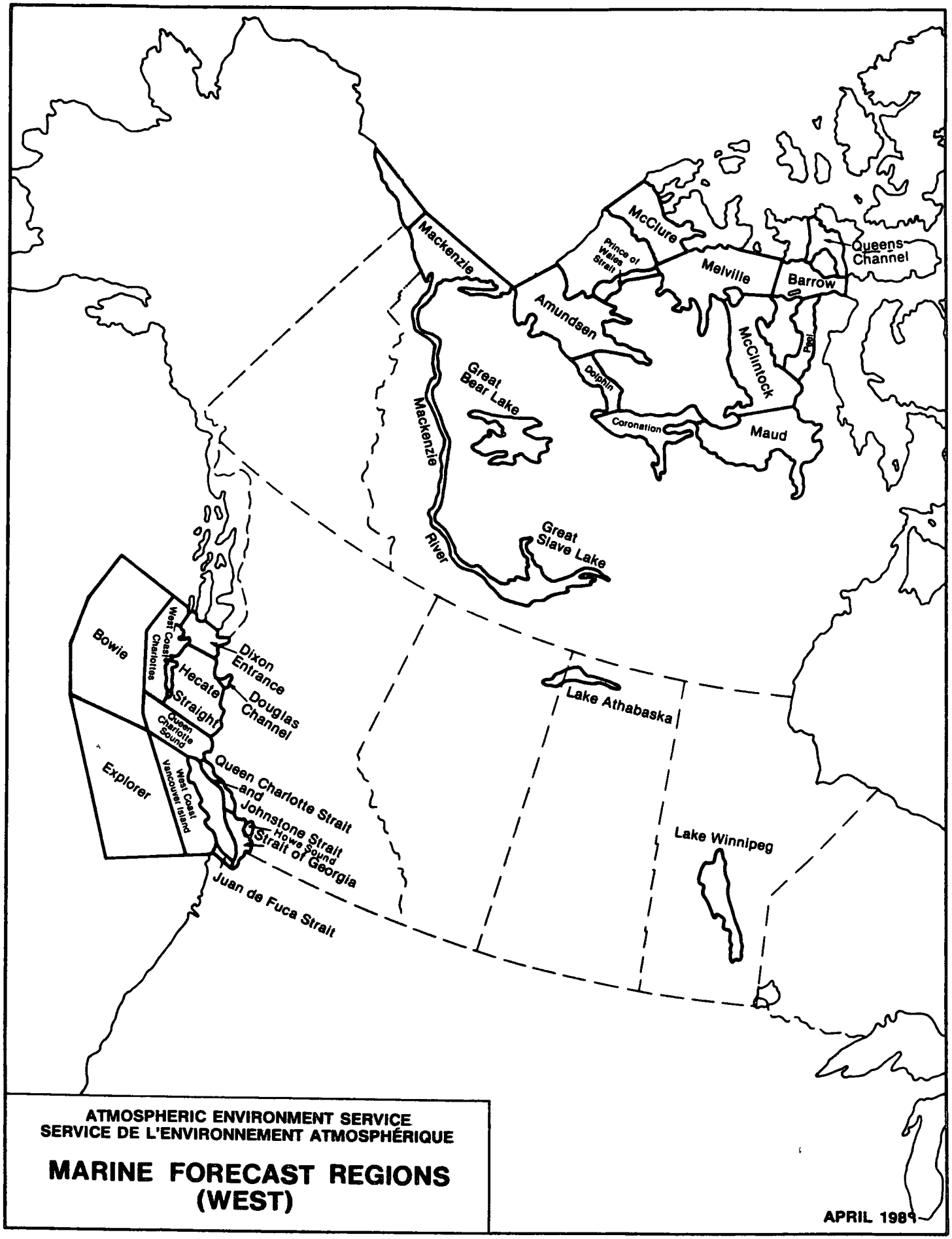

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHÉRIQUE
AIRPORT FORECASTS
PREVISIONS D'AÉROPORT
APRIL 1989
AVRIL


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHÉRIQUE
AVIATION WEATHER FORECAST REGIONS
RÉGIONS DE PRÉVISIONS MÉTÉOROLOGIQUES POUR L'AVIATION
FORECASTS ISSUED BY/PREVISIONS MISES PAR
VANCOUVER OR/OU WHITEHORSE
PEEL RIVER
DAWSON
MACKENZIE MOUNTAINS
AISHIHIK
WHITEHORSE
LIARD
CARIBOO
NORTH COAST
SOUTH COAST
SOUTHERN MOUNTAINS
APRIL
AVRIL 1989


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHÉRIQUE
AVIATION WEATHER FORECAST REGIONS
RÉGIONS DE PRÉVISIONS MÉTÉOROLOGIQUES
POUR L AVIATION
FORECASTS ISSUED BY/PREVISIONS MISES PAR
EDMONTON (ARCTIC-ARCTIQUE)
ALERT
ISACHSEN
MOULD
JONES
DELTA
NORTH VICTORIA
AMUNDSEN
RESOLUTE
BYLOT
CUMBERLAND
CAMBRIDGE BAY
NORMAN
WILLIAM
HALL
FOXE
FROBISHER
SIMPSON
GREAT SLAVE
DUBAWNT
CHESTERFIELD
CORAL
SOUTH HUDSON
APRIL
AVRIL 1989


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHÉRIQUE
AVIATION WEATHER FORECAST REGIONS
RÉGIONS DE PRÉVISIONS MÉTÉOROLOGIQUES POUR L AVIATION
FORECASTS ISSUED BY/PREVISIONS MISES PAR
EDMONTON OR/OU WINNIPEG
FORT NELSON
HIGH LEVEL
ATHABASCA
PEACE
URANIUM
WOLLASTON
SEAL RIVER
CHURCHILL
CREE LAKE
REINDEER
INDIAN LAKE
YORK
THOMPSON
EDSON
EDMONTON
MEADOW LAKE
LA RONGE
THE PAS
GODS LAKE
SEVERN RIVER
BATTLEFORD
PRINCE ALBERT
CARROT RIVER
CALGARY
CORONATION
KINDERSLEY
SASKATOON
YORKTON
GRAND RAPIDS
FAVOURABLE LAKE
PICKLE LAKE
LETHBRIDGE
SWIFT CURRENT
MOOSE JAW
REGINA
DAUPHIN
GIMLI
RED LAKE
SIOUX LOOKOUT
NIPIGON
BRANDON
WINNIPEG
KENORA
RAINY LAKE
ATIKOKAN
LAKEHEAD
APRIL 1989
AVRIL

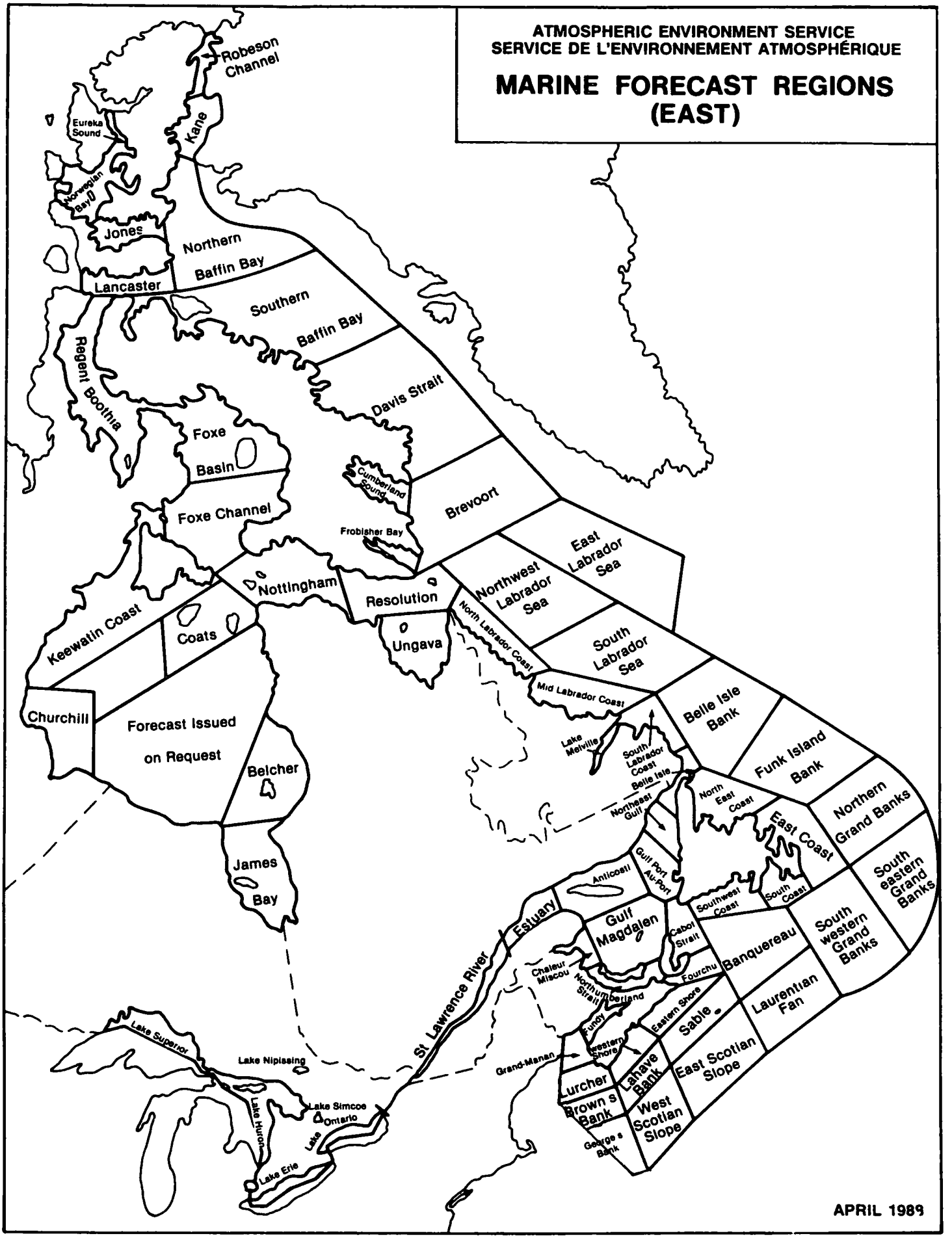

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHÉRIQUE
AVIATION WEATHER FORECAST REGIONS
RÉGIONS DE PRÉVISIONS MÉTÉOROLOGIQUES POUR L AVIATION
FORECASTS ISSUED BY/PREVISIONS MISES PAR
TORONTO MONTREAL HALIFAX OR/OU GANDER
HUDSON
JUNGAVA
NAIN BANK
TORNGAT
HARRISON BANK
ST ANTHONY BASIN
NORTHEAST SHELF
FLEMISH CAP
HARRISON
HAMILTON
SCHEFFERVILLE
NATASHQUAN
BONNE BAY
EXPLOITS
FORTUNE
ST GEORGES
BALEINE
BIENVILLE
MOISIE
JAMES
GULF
GASPE
SEPT-ISLES
MISTASSINI
RUPERT
COCHRANE
LAURENTIAN
SAGUENAY
QUEBEC CITY
NEW BRUNSWICK
STRAITS
WEST SCOTIA
VALDOR
SUPERIOR
SUDBURY
OTTAWA MONTREAL
EASTERN TOWNSHIPS
EASTERN ONTARIO
SABLE
(ON REQUEST/SUR DEMANDE)
SOUTH WESTERN ONTARIO
APRIL AVRIL 1989

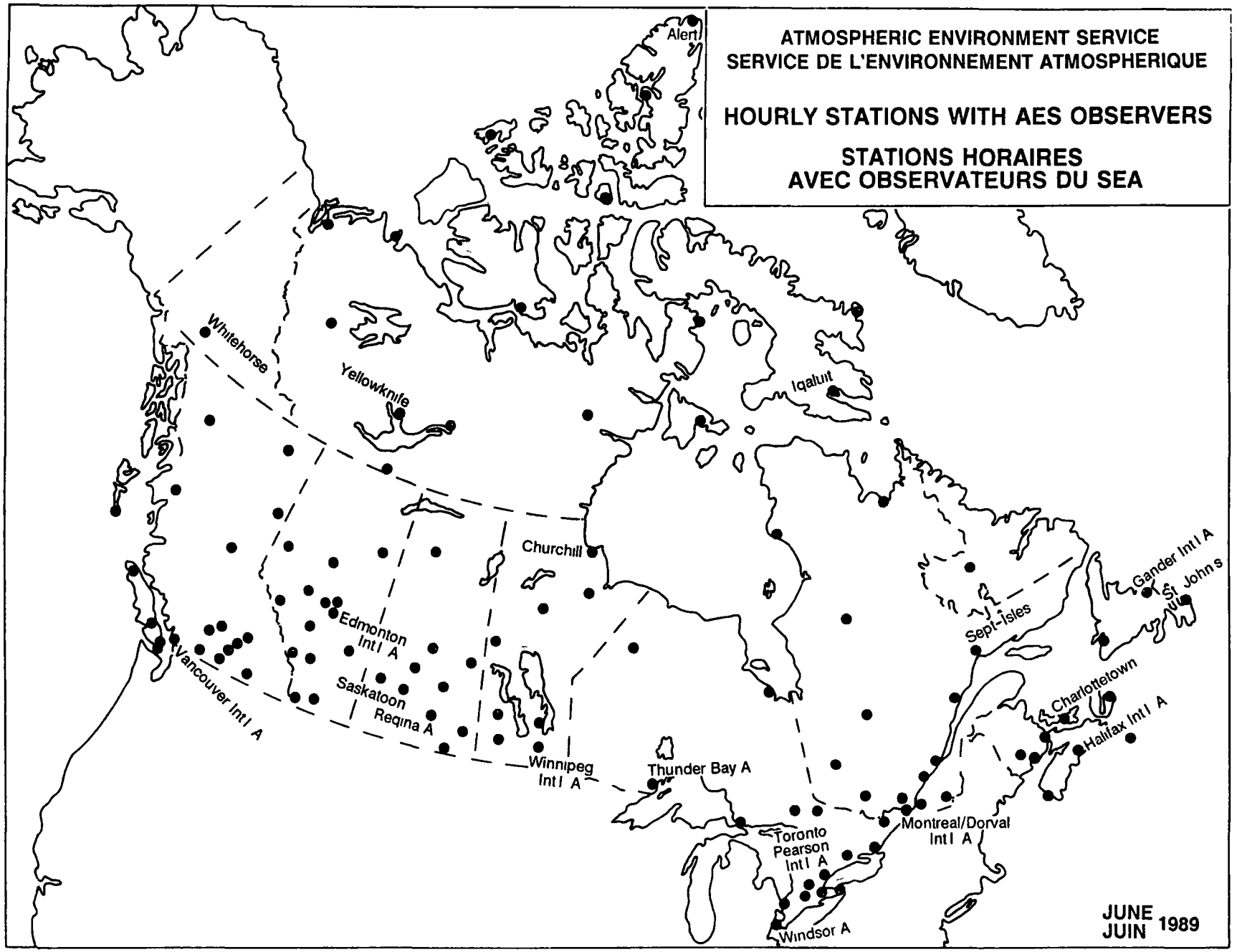


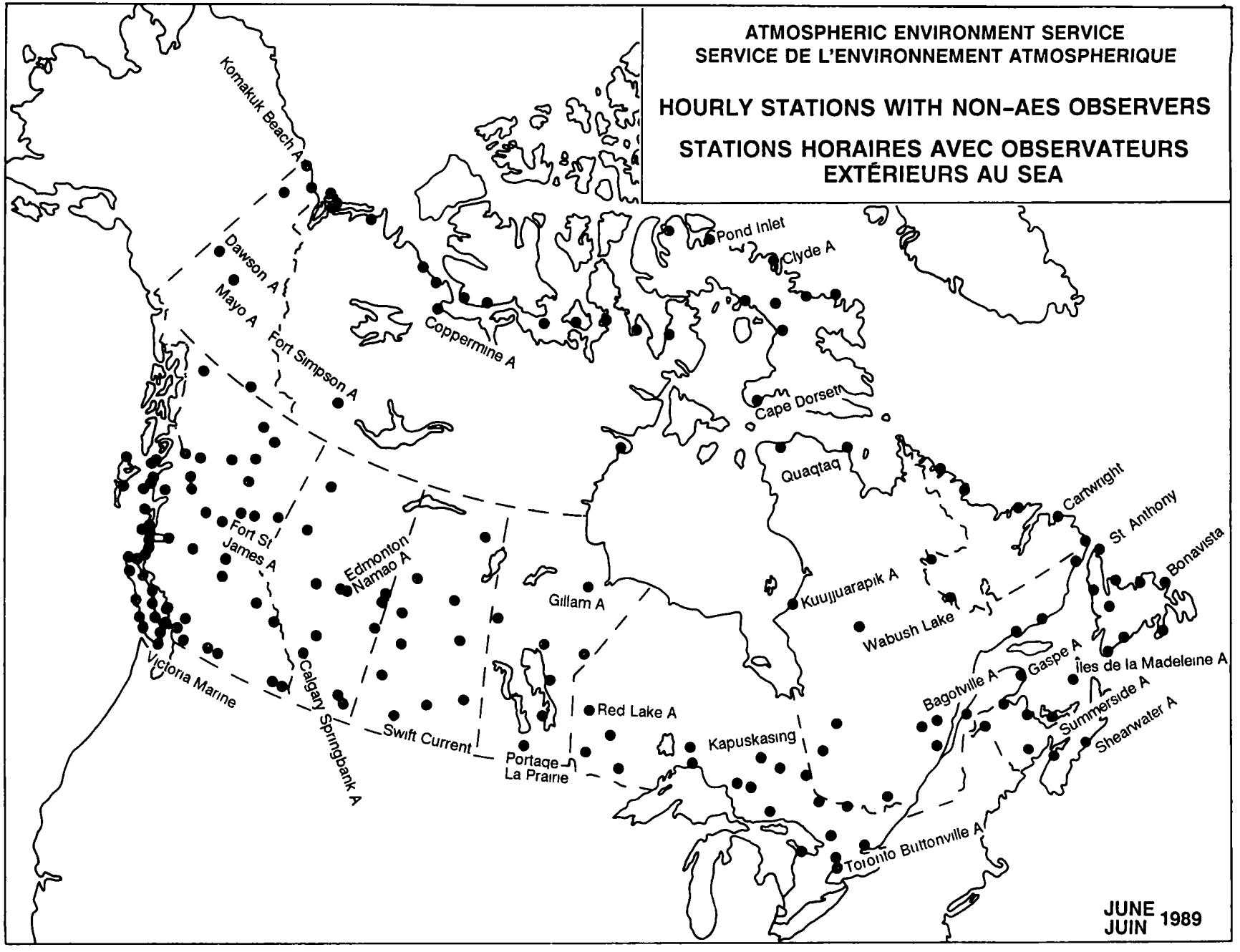
ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHÉRIQUE

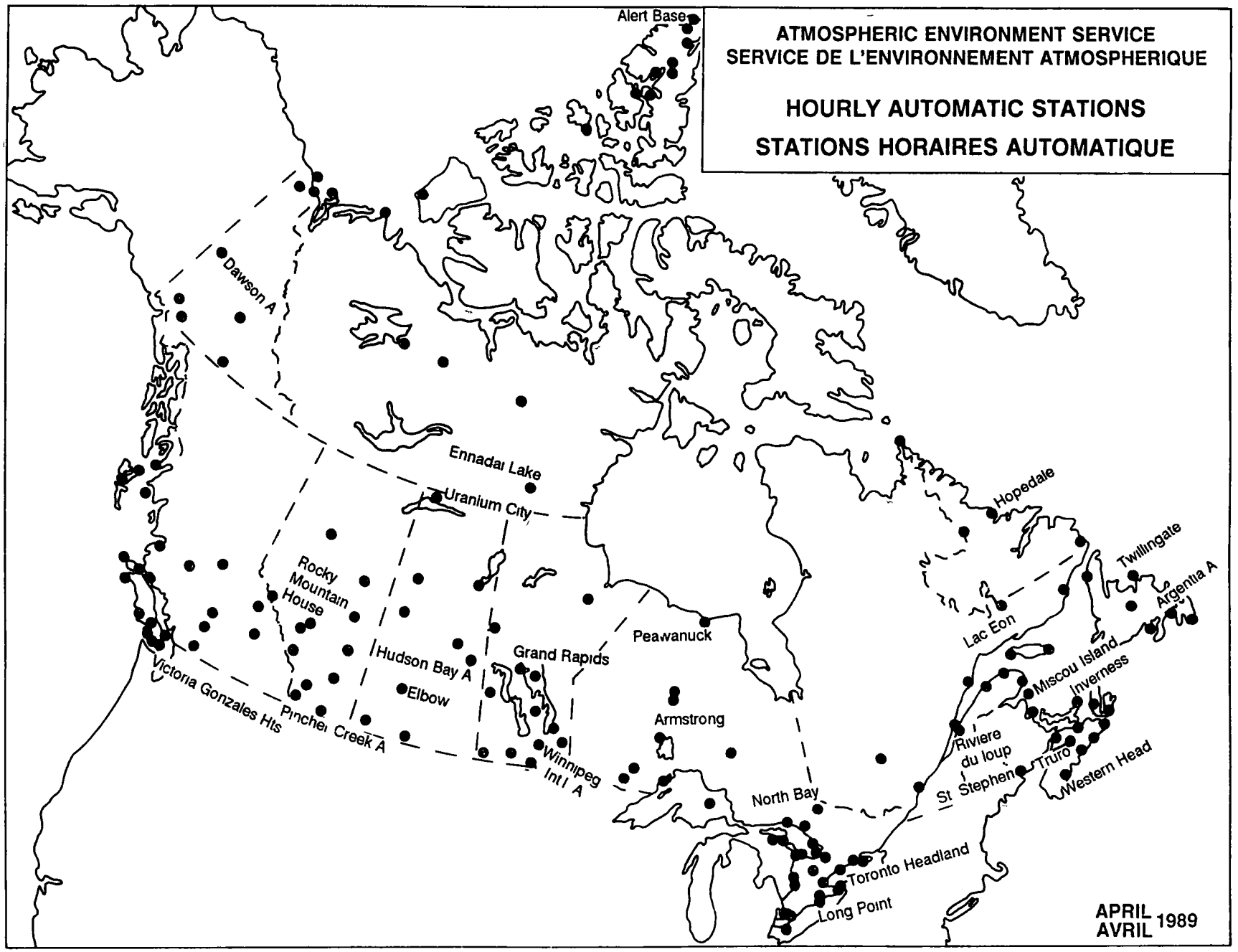
MARINE FORECAST REGIONS (WEST)

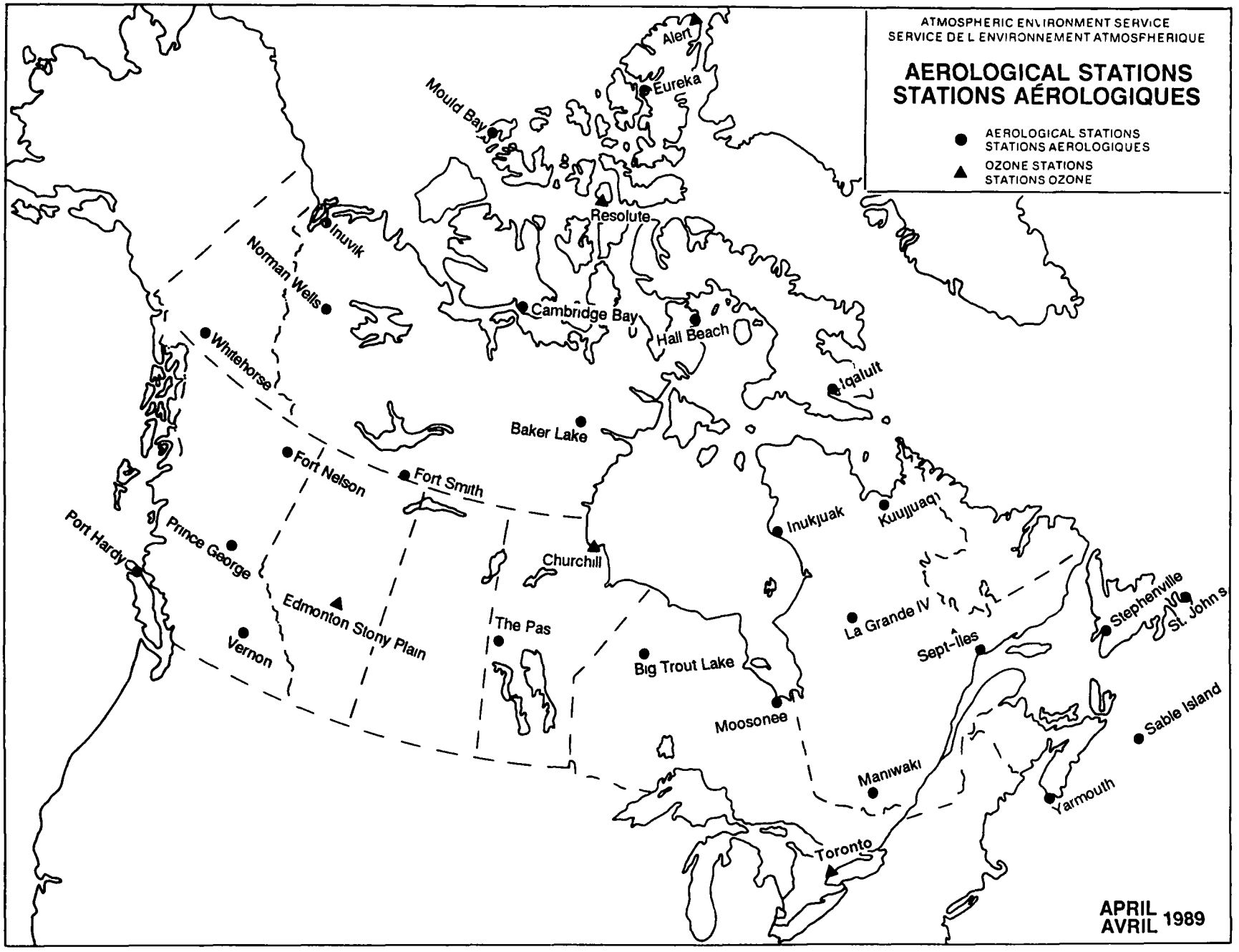
APRIL 1989

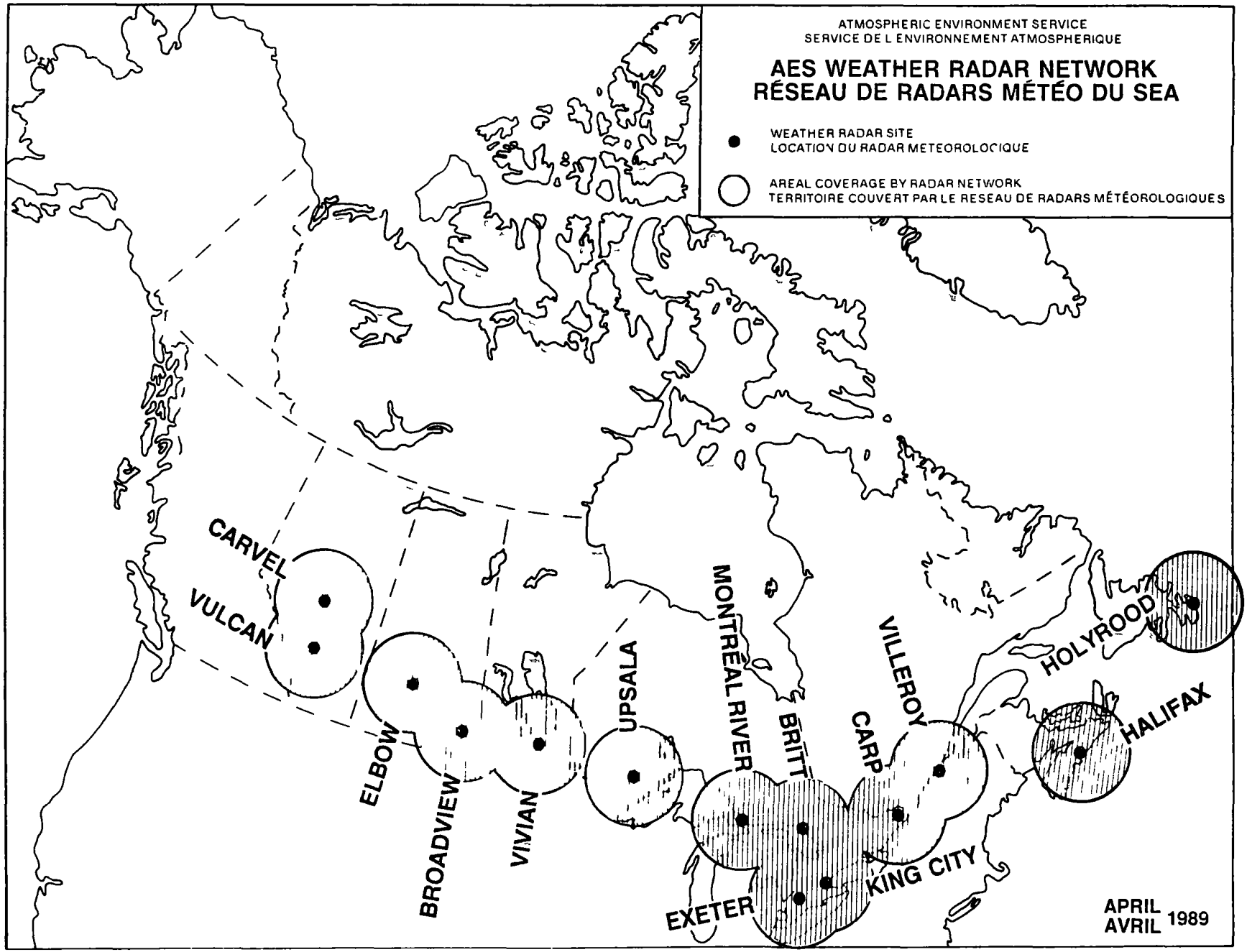

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHÉRIQUE
MARINE FORECAST REGIONS
(EAST)
Robeson Channel
Eureka Sound
Kane
Norwegian Bay
Jones
Northern Baffin Bay
Lancaster
Southern Baffin Bay
Regent Boothia
Davis Strait
Foxe Basin
Cumberland Sound
Foxe Channel
Brevoort
Frobisher Bay
East Labrador Sea
Nottingham
Resolution
Northwest Labrador Sea
Keewatin Coast
Coats
Ungava
North Labrador Coast
South Labrador Sea
Mid Labrador Coast
Churchill
Forecast Issued on Request
Belcher
Belle Isle Bank
Lake Melville
South Labrador Coast
Belle Isle
Funk Island Bank
North East Coast
Northern Grand Banks
Northeast Gulf
East Coast
James Bay
Gulf Port Au Port
Anticosti
South eastern Grand Banks
Southwest Coast
South Coast
Estuary
Gulf Magdalen
Cabot Strait
Banquereau
South western Grand Banks
Chaleur Miscou
Fourchu
Northumberland Strait
Laurentian Fan
Eastern Shore
Fundy
Sable
Western Shore
Grand-Manan
Lahave Bank
East Scotian Slope
Lurcher
Brown's Bank
West Scotian Slope
George's Bank
St Lawrence River
Lake Superior
Lake Nipissing
Lake Huron
Lake Simcoe
Lake Ontario
Lake Erie
APRIL 1989

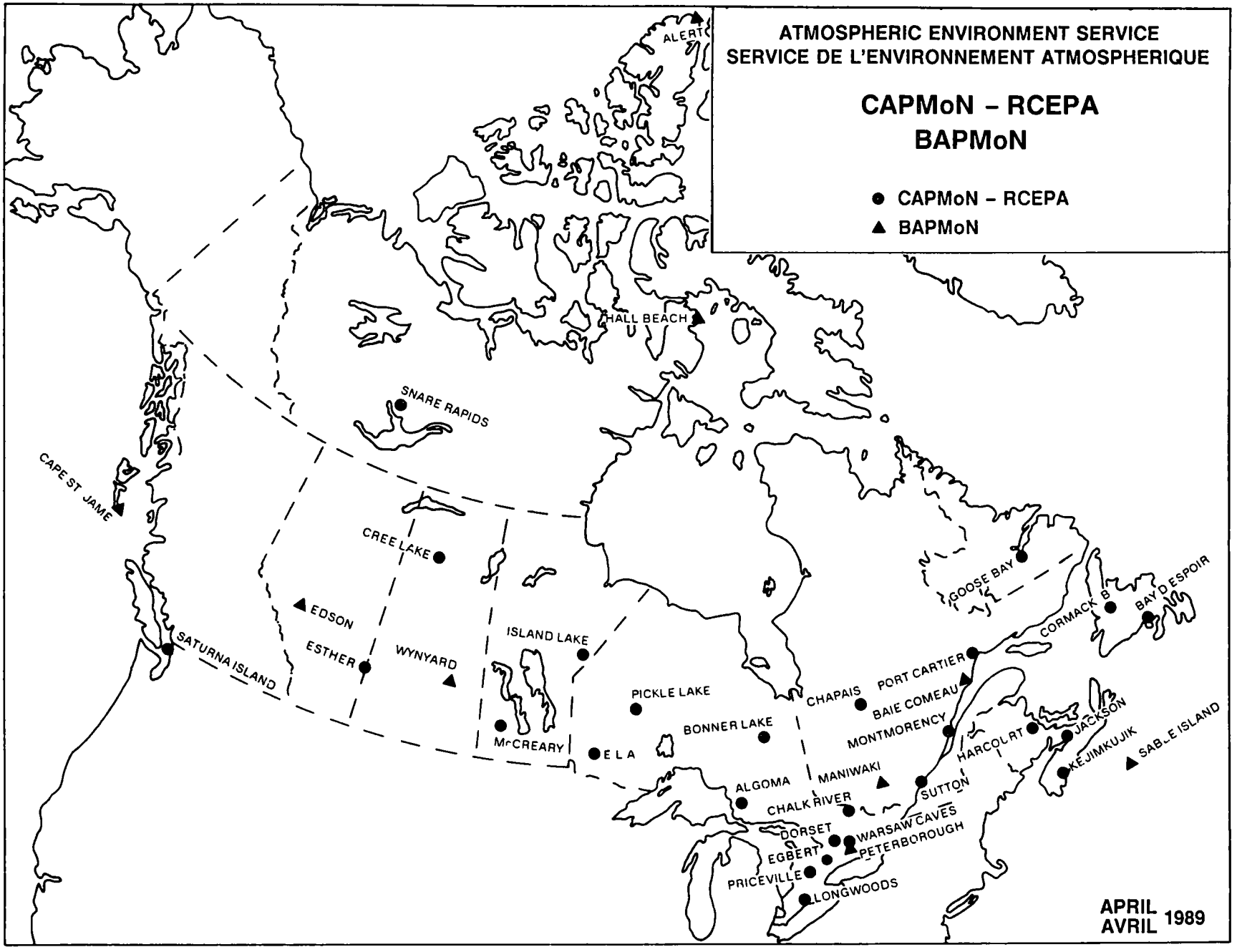

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
HOURLY STATIONS WITH AES OBSERVERS
STATIONS HORAIRES
AVEC OBSERVATEURS DU SEA
Alert
Whitehorse
Yellowknife
Iqaluit
Churchill
Edmonton Intl A
Saskatoon
Regina A
Vancouver Intl A
Winnipeg Intl A
Thunder Bay A
Toronto Pearson Intl A
Windsor A
Montreal/Dorval Intl A
Sept-Isles
Gander Intl A
St John's
Charlottetown
Halifax Intl A
JUNE
JUIN 1989

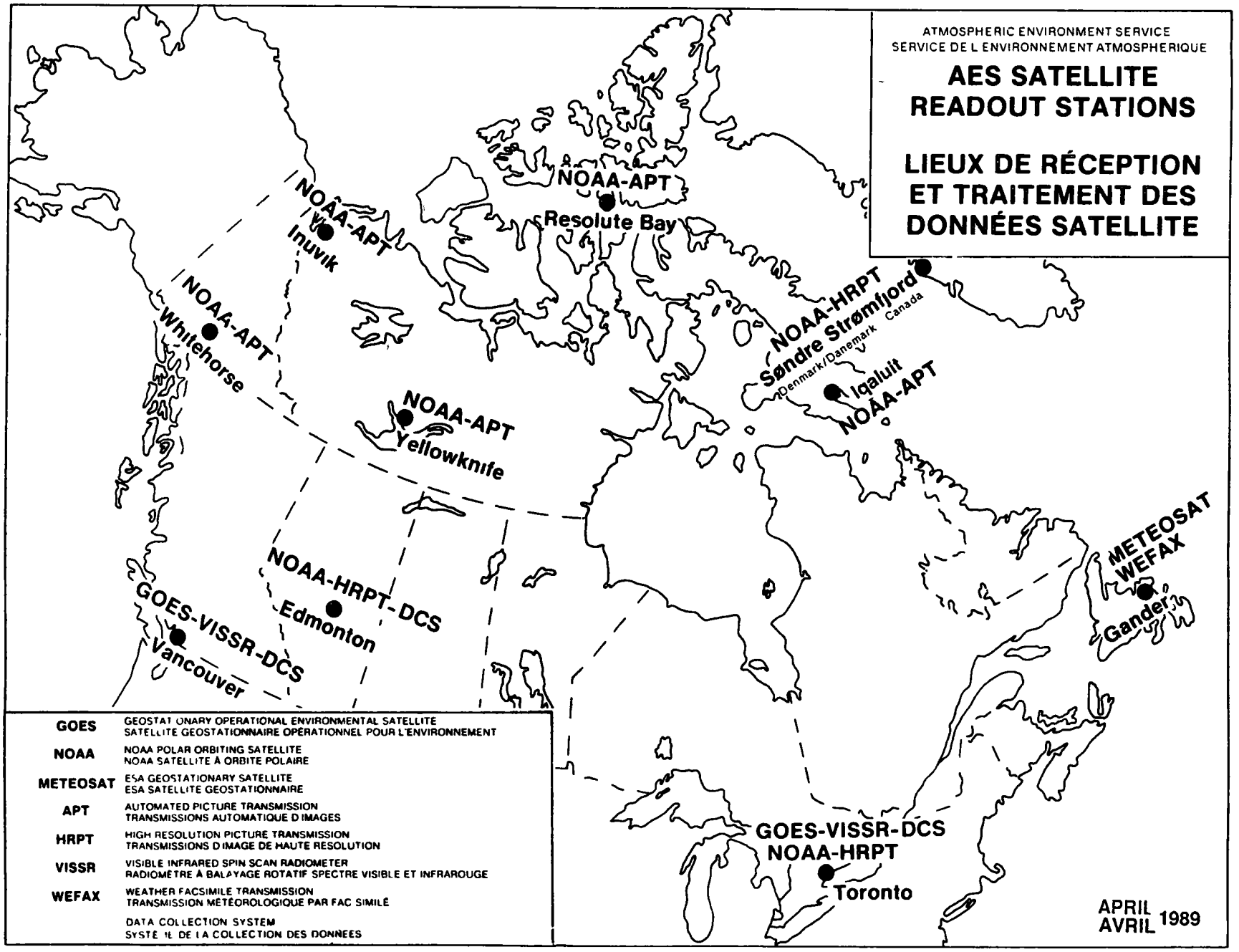

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
HOURLY STATIONS WITH NON-AES OBSERVERS
STATIONS HORAIRES AVEC OBSERVATEURS EXTÉRIEURS AU SEA
Komakuk Beach A
Dawson A
Mayo A
Fort Simpson A
Coppermine A
Pond Inlet
Clyde A
Cape Dorset
Quaqtaq
Cartwright
St Anthony
Bonavista
Fort St James A
Edmonton Namao A
Gillam A
Kuujjuarapik A
Wabush Lake
Gaspe A
Îles de la Madeleine A
Bagotville A
Summerside A
Shearwater A
Victoria Marine
Calgary Springbank A
Swift Current
Portage La Prairie
Red Lake A
Kapuskasing
Toronto Buttonville A
JUNE JUIN 1989

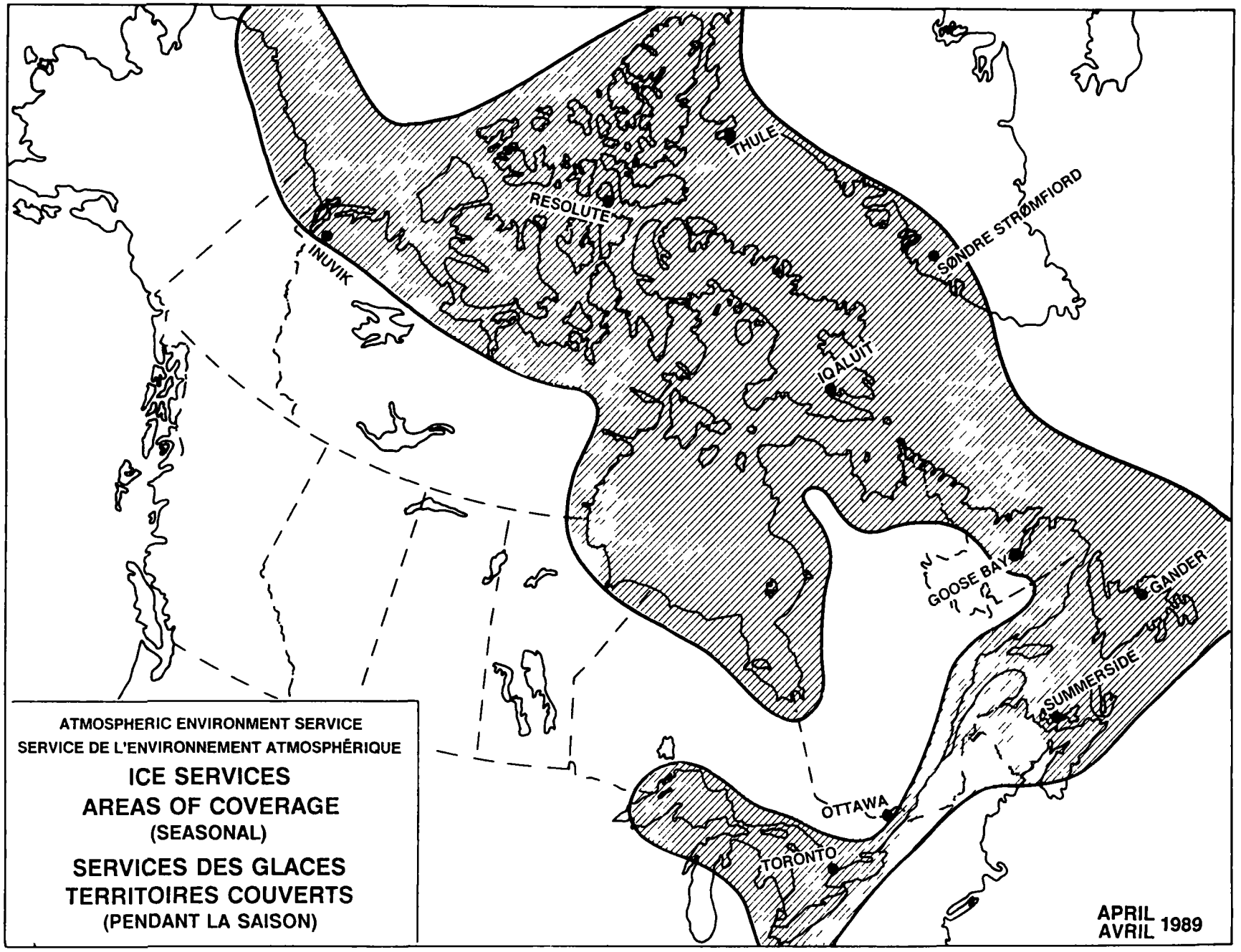

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
HOURLY AUTOMATIC STATIONS
STATIONS HORAIRES AUTOMATIQUE
Alert Base
Dawson A
Ennadai Lake
Uranium City
Rocky Mountain House
Hudson Bay A
Elbow
Grand Rapids
Peawanuck
Victoria Gonzales Hts
Pincher Creek A
Winnipeg Int'l A
Armstrong
North Bay
Hopedale
Lac Eon
Twillingate
Argentia A
Miscou Island
Inverness
Riviere du loup
St Stephen
Truro
Western Head
Toronto Headland
Long Point
APRIL 1989
AVRIL

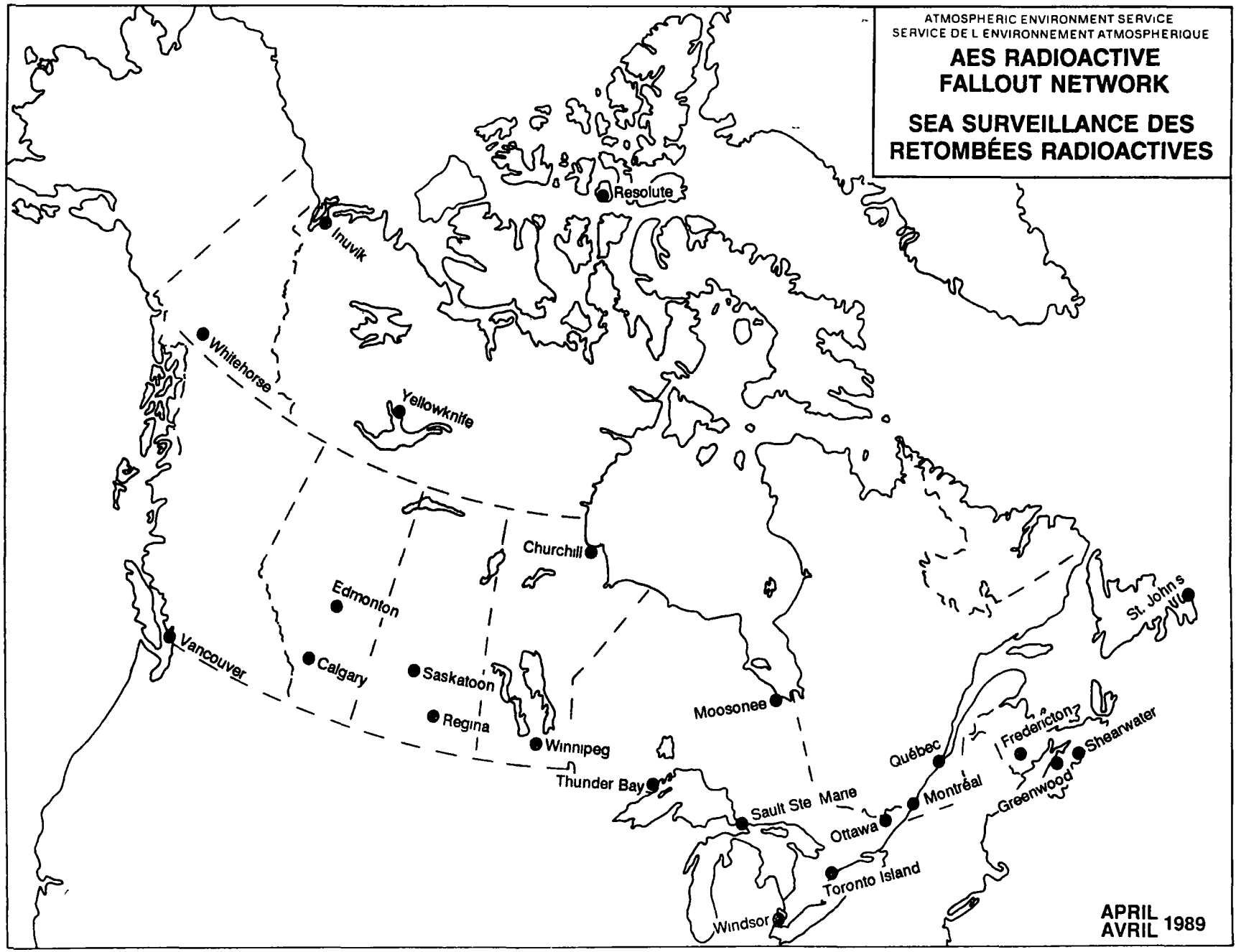

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHERIQUE
AEROLOGICAL STATIONS
STATIONS AÉROLOGIQUES
AEROLOGICAL STATIONS
STATIONS AEROLOGIQUES
OZONE STATIONS
STATIONS OZONE
Alert
Eureka
Mould Bay
Resolute
Inuvik
Norman Wells
Cambridge Bay
Hall Beach
Iqaluit
Whitehorse
Baker Lake
Fort Nelson
Fort Smith
Inukjuak
Kuujjuaq
Port Hardy
Prince George
Churchill
Edmonton Stony Plain
La Grande IV
Stephenville
St. John's
The Pas
Sept-Îles
Vernon
Big Trout Lake
Moosonee
Sable Island
Manıwakı
Yarmouth
Toronto
APRIL
AVRIL 1989

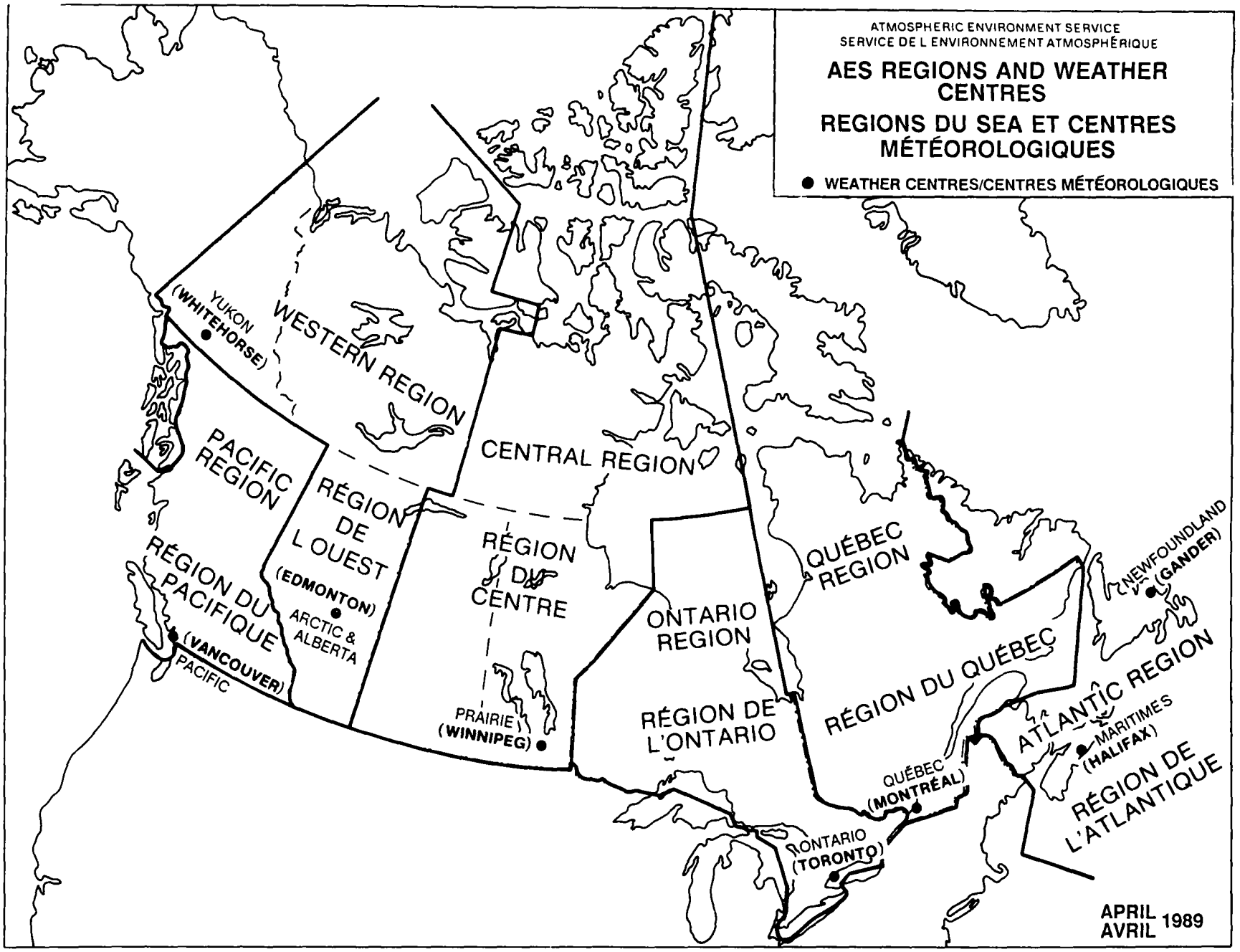

ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHERIQUE
AES WEATHER RADAR NETWORK
RÉSEAU DE RADARS MÉTÉO DU SEA
WEATHER RADAR SITE
LOCATION DU RADAR METEOROLOGIQUE
AREAL COVERAGE BY RADAR NETWORK
TERRITOIRE COUVERT PAR LE RESEAU DE RADARS MÉTÉOROLOGIQUES
CARVEL
VULCAN
ELBOW
BROADVIEW
VIVIAN
UPSALA
MONTREAL RIVER
BRITT
VILLEROY
CARP
KING CITY
EXETER
HOLYROOD
HALIFAX
APRIL
AVRIL 1989


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHERIQUE
CAPMoN – RCEPA
BAPMoN
CAPMoN – RCEPA
BAPMoN
ALERT
HALL BEACH
SNARE RAPIDS
CAPE ST JAME
CREE LAKE
EDSON
ESTHER
WYNYARD
SATURNA ISLAND
ISLAND LAKE
PICKLE LAKE
BONNER LAKE
McCREARY
E L A
GOOSE BAY
CORMACK
BAY D'ESPOIR
CHAPAIS
PORT CARTIER
BAIE COMEAU
MONTMORENCY
HARCOURT
JACKSON
KEJIMKUJIK
SABLE ISLAND
MANIWAKI
ALGOMA
CHALK RIVER
SUTTON
DORSET
WARSAW CAVES
PETERBOROUGH
EGBERT
PRICEVILLE
LONGWOODS
APRIL
AVRIL 1989


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHERIQUE
AES SATELLITE READOUT STATIONS
LIEUX DE RÉCEPTION ET TRAITEMENT DES DONNÉES SATELLITE
NOAA-APT
Resolute Bay
NOAA-APT
Inuvik
NOAA-APT
Whitehorse
NOAA-HRPT
Søndre Strømfjord
Denmark/Danemark
Canada
Iqaluit
NOAA-APT
NOAA-APT
Yellowknife
NOAA-HRPT-DCS
Edmonton
GOES-VISSR-DCS
Vancouver
METEOSAT WEFAX
Gander
GOES-VISSR-DCS
NOAA-HRPT
Toronto
APRIL AVRIL 1989
GOES GEOSTATIONARY OPERATIONAL ENVIRONMENTAL SATELLITE
SATELLITE GEOSTATIONNAIRE OPÉRATIONNEL POUR L'ENVIRONNEMENT
NOAA NOAA POLAR ORBITING SATELLITE
NOAA SATELLITE À ORBITE POLAIRE
METEOSAT ESA GEOSTATIONARY SATELLITE
ESA SATELLITE GEOSTATIONNAIRE
APT AUTOMATED PICTURE TRANSMISSION
TRANSMISSIONS AUTOMATIQUE D IMAGES
HRPT HIGH RESOLUTION PICTURE TRANSMISSION
TRANSMISSIONS D IMAGE DE HAUTE RESOLUTION
VISSR VISIBLE INFRARED SPIN SCAN RADIOMETER
RADIOMETRE À BALAYAGE ROTATIF SPECTRE VISIBLE ET INFRAROUGE
WEFAX WEATHER FACSIMILE TRANSMISSION
TRANSMISSION MÉTÉOROLOGIQUE PAR FAC SIMILÉ
DATA COLLECTION SYSTEM
SYSTÈME DE LA COLLECTION DES DONNEES


THULE
RESOLUTE
INUVIK
SØNDRE STRØMFIORD
IQALUIT
GOOSE BAY
GANDER
SUMMERSIDE
OTTAWA
TORONTO
ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L'ENVIRONNEMENT ATMOSPHÉRIQUE
ICE SERVICES
AREAS OF COVERAGE
(SEASONAL)
SERVICES DES GLACES
TERRITOIRES COUVERTS
(PENDANT LA SAISON)
APRIL
AVRIL 1989


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHERIQUE
AES RADIOACTIVE FALLOUT NETWORK
SEA SURVEILLANCE DES RETOMBÉES RADIOACTIVES
Resolute
Inuvik
Whitehorse
Yellowknife
Churchill
Edmonton
Vancouver
Calgary
Saskatoon
Regina
Winnipeg
Thunder Bay
Moosonee
Québec
Fredericton
Shearwater
Greenwood
St. John's
Sault Ste Marie
Ottawa
Montréal
Toronto Island
Windsor
APRIL
AVRIL 1989


ATMOSPHERIC ENVIRONMENT SERVICE
SERVICE DE L ENVIRONNEMENT ATMOSPHÉRIQUE
AES REGIONS AND WEATHER CENTRES
REGIONS DU SEA ET CENTRES MÉTÉOROLOGIQUES
WEATHER CENTRES/CENTRES MÉTÉOROLOGIQUES
YUKON (WHITEHORSE)
WESTERN REGION
PACIFIC REGION
RÉGION DU PACIFIQUE
(VANCOUVER)
PACIFIC
RÉGION DE L OUEST
(EDMONTON)
ARCTIC & ALBERTA
CENTRAL REGION
RÉGION DU CENTRE
PRAIRIE (WINNIPEG)
ONTARIO REGION
RÉGION DE L'ONTARIO
ONTARIO (TORONTO)
QUÉBEC REGION
RÉGION DU QUÉBEC
QUÉBEC (MONTRÉAL)
NEWFOUNDLAND (GANDER)
ATLANTIC REGION
MARITIMES (HALIFAX)
RÉGION DE L'ATLANTIQUE
APRIL AVRIL 1989

CHAPTER 5

FUNCTIONS AND BUDGETS BY ORGANIZATION

ATMOSPHERIC ENVIRONMENT SERVICE

5 1 ATMOSPHERIC ENVIRONMENT SERVICE

5 1 1 AES Organizational Structure

The Atmospheric Environment Service is organized functionally into five Directorates and two Branches

Weather Services Directorate	WSD
Atmospheric Research Directorate	ARD
Canadian Climate Centre	CCC
Central Services Directorate	CSD
Policy, Planning and Assessment Directorate	APDG
Finance and Administration Branch	AABD
Human Resources Branch	AHRD

Four of the five Directorates plus the Finance and Administration Branch and the Human Resources Branch have their headquarters in Downsview, Ontario The Policy, Planning and Assessment Directorate has its office in Hull, Quebec but also maintains staff in Downsview The Assistant Deputy Minister has an office in both Hull and Downsview Downsview, of course, houses more than just H Q management and administration units Telecommunications, research and training staff, labs, instruments experts, the library, and other national operational units are also located there

The Atmospheric Environment Service provides weather, ice and sea-state services to the Department of National Defence as provided for in a Memorandum of Understanding between the two parties For this purpose DND maintains a Canadian Forces Weather Service headed by the Director of Meteorology and Oceanography (DMetOc) in Ottawa DMetOc formally reports to a higher level DND authority while, functionally the Director reports to either the ADM of the Atmospheric Environment Service or to the Director General of the Weather Services Directorate as appropriate, and is a full member of the AES Management Committee

The AES part of the DOE Communications Directorate is located in Downsview, but is not formally part of AES However, it does provide direct support to the ADM and full services to AES managers This includes development and implementation of AES' public information and media relations programs (in particular press releases)

The Secretariat for the Changing Atmosphere, which includes the liaison office for the federal scientific LRTAP program, is also located in Downsview This office reports directly to the ADM and is responsible for the provision of relevant information and advisory services on changing atmosphere issues It also co-ordinates Canada-USA and federal/provincial LRTAP scientific research programs

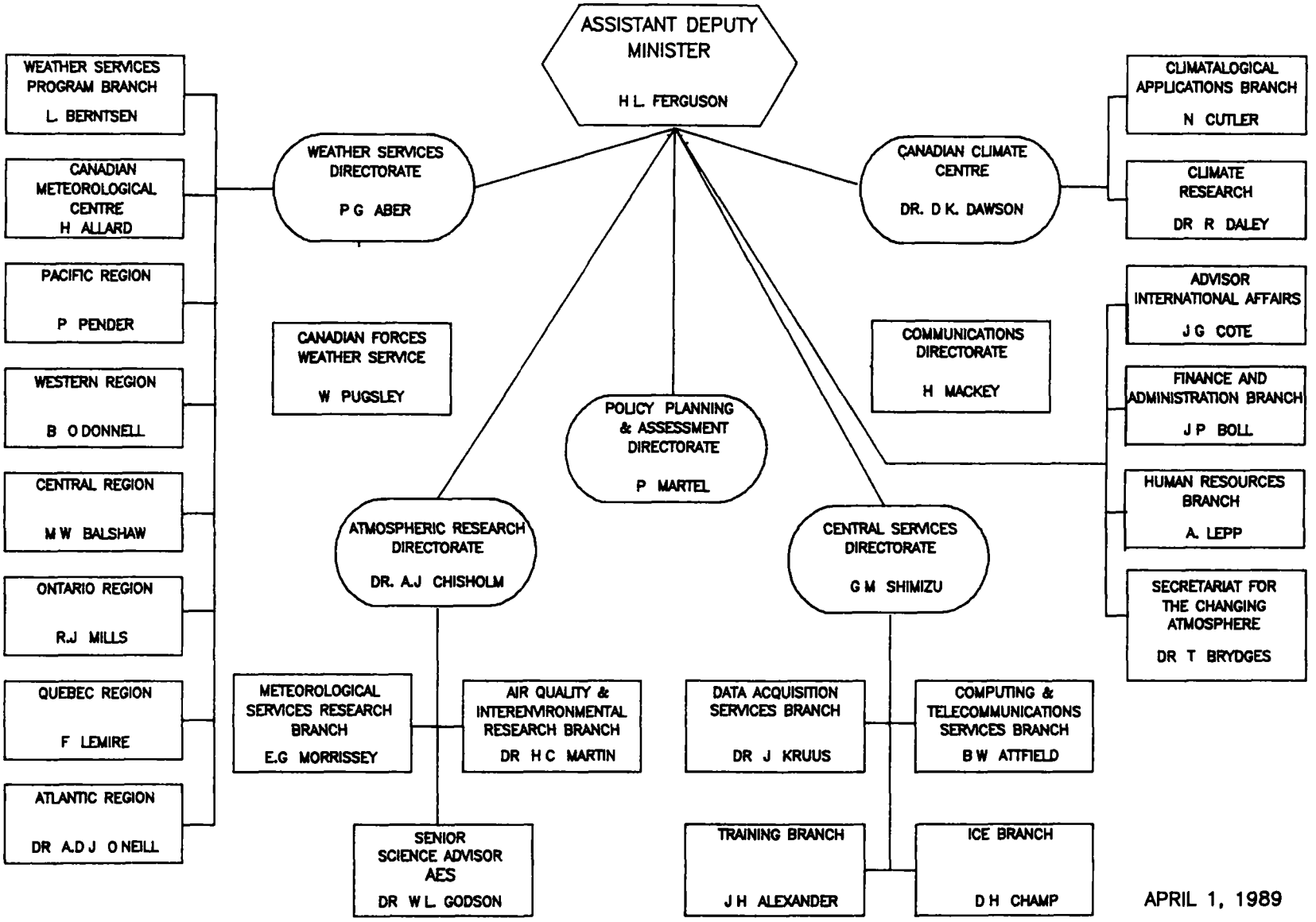
The International Affairs Co-ordinator reports directly to the ADM, and co-ordinates and assists with the official business with other countries and organizations

One other special advisor reports to the ADM This advisor is responsible for co-ordinating the AES plan to further the growth of meteorology through an enhanced Canadian private sector

On the following resource charts, the Assistant Deputy Minister's Office, International Affairs Co-ordinator, Private Sector Co-ordinator, Secretariat for the Changing Atmosphere, and Policy, Planning and Assessment Directorate are grouped together in the column headed "ADMA"

Finally, it should be noted that while there is a relationship between the organizational structure and the five program components (sub-activities) of the AES, they do not correspond exactly For program support purposes, certain "common service" directorates have been created within AES to achieve such objectives as efficiency, effectiveness and the centralization of expertise These directorates include Atmospheric Research Directorate, Central Services Directorate, Policy, Planning and Assessment Directorate, Finance and Administration Branch, and Human Resources Branch

ATMOSPHERIC ENVIRONMENT SERVICE



APRIL 1, 1989

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET

($000)

5 1 2 TOTAL BUDGET BY PROGRAM ACTIVITY AND ORGANIZATION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		ADMA	AABD	AHRD	ARD	CCC	CSD	WSD	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES									
0810 MANAGEMENT		1552 7	2116 5						3669 2
0830 COMMON SUPPORT SERVICES			3274 0	2075 4					5349 4
	TOTAL	1552 7	5390 5	2075 4					9018 6
1000 WEATHER SERVICES									
1100 PUBLIC WEATHER SERVICES								24309 5	24309 5
1200 MARINE WEATHER SERVICES								1203 2	1203 2
1300 AVIATION WEATHER SERVICES								6922 5	6922 5
1400 ECONOMIC WEATHER SERVICES								620 6	620 6
1500 CANADIAN FORCES WEATHER SERVICES								6553 0	6553 0
2000 DATA ACQUISITION							12762 2	35920 2	48682 4
3000 WEATHER SERVICES SUPPORT SYSTEMS			6929 4		7687 3		25897 6	35665 6	76179 9
	TOTAL		6929 4		7687 3		38659 8	111194 6	164471 1
4000 CLIMATE SERVICES & RESEARCH									
4100 CLIMATE SERVICES						4460 5	161 3	2732 9	7354 7
4500 CLIMATE RESEARCH AND DEVELOPMENT					1108 1	2997 7			4105 8
4600 CLIMATE SERVICES SUPPORT SYSTEMS			100 0			1177 4	3557 3	563 1	5397 8
4700 CANADIAN CLIMATE PROGRAM						891 6			891 6
	TOTAL		100 0		1108 1	9527 2	3718 6	3296 0	17749 9
5 ICE SERVICES									
5100 ICE RECONNAISSANCE & DATA ACQUISITION							17544 0		17544 0
5200 ICE ANALYSIS & FORECASTING							3954 2		3954 2
5300 ICE CLIMATE SERVICES							356 8		356 8
5400 ICE SERVICES SUPPORT SYSTEM			120 0				356 0		476 0
5500 RESEARCH AND DEVELOPMENT -ICE							2087 6		2087 6
	TOTAL		120 0				24298 6		24418 6
6000 AIR QUALITY SERVICES & RESEARCH									
6100 AIR QUALITY SERVICES			225 0		1096 2			851 5	2172 7
6 AIR QUALITY RESEARCH		476 0			10092 8			234 0	10802 8
61 AIR QUALITY & RESEARCH SUPPORT SERVICES					1547 3				1547 3
	TOTAL	476 0	225 0		12736 3			1085 5	14522 8
GRAND TOTAL		2028 7	12764 9	2075 4	21531 7	9527 2	66677 0	115576 1	230181 0

ATMOSPHERIC ENVIRONMENT SERVICE
1989-90 BUDGET

5 1 3 PERSON YEARS BY PROGRAM ACTIVITY AND ORGANIZATION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		ADMA	AABD	AHRD	ARD	CLC	CSD	WSD	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES									
0810 MANAGEMENT		22 0	6 0						28 0
0830 COMMON SUPPORT SERVICES			62 0	36 0					98 0
	TOTAL	22 0	68 0	36 0					126 0
1000 WEATHER SERVICES									
1100 PUBLIC WEATHER SERVICES								468 4	468 4
1200 MARINE WEATHER SERVICES								19 0	19 0
1300 AVIATION WEATHER SERVICES								135 5	135 5
1400 ECONOMIC WEATHER SERVICES								13 4	13 4
1500 CANADIAN FORCES WEATHER SERVICES								108 0	108 0
2000 DATA ACQUISITION							74 0	362 5	436 5
3000 WEATHER SERVICES SUPPORT SYSTEMS			31 0		79 0		145 5	436 7	692 2
	TOTAL		31 0		79 0		219 5	1543 5	1873 0
4000 CLIMATE SERVICES & RESEARCH									
4100 CLIMATE SERVICES						73 5	3 0	40 3	116 8
4500 CLIMATE RESEARCH AND DEVELOPMENT					10 0	42 5			52 5
4600 CLIMATE SERVICES SUPPORT SYSTEMS						9 2	34 0	11 2	54 4
4700 CANADIAN CLIMATE PROGRAM						1 8			1 8
	TOTAL				10 0	127 0	37 0	51 5	225 5
5000 ICE SERVICES									
5100 ICE RECONNAISSANCE & DATA ACQUISITION							28 0		28 0
5200 ICE ANALYSIS & FORECASTING							28 7		28 7
5300 ICE CLIMATE SERVICES							4 0		4 0
5400 ICE SERVICES SUPPORT SYSTEM							4 0		4 0
5500 RESEARCH AND DEVELOPMENT -ICE							4 8		4 8
	TOTAL						69 5		69 5
6000 AIR QUALITY SERVICES & RESEARCH									
6100 AIR QUALITY SERVICES					7 5			13 8	21 3
6300 AIR QUALITY RESEARCH		8 0			74 0			2 2	84 2
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES					9 5				9 5
	TOTAL	8 0			91 0			16 0	115 0
GRAND TOTAL		30 0	99 0	36 0	180 0	127 0	326 0	1611 0	2409 0

ATMOSPHERIC ENVIRONMENT SERVICE
1989-90 BUDGET
($000)

5 1 4 SALARY BY PROGRAM ACTIVITY AND ORGANIZATION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		ADMA	AABD	AHRD	ARD	CCC	CSD	WSD	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES									
0810 MANAGEMENT		1249 0	327 5						1576.5
0830 COMMON SUPPORT SERVICES			2239 3	1725 0					3964 3
	TOTAL	1249 0	2566 8	1725 0					5540 8
1000 WEATHER SERVICES									
1100 PUBLIC WEATHER SERVICES								22516 3	22516 3
1200 MARINE WEATHER SERVICES								993 8	993 8
1300 AVIATION WEATHER SERVICES								6389 8	6389 8
1400 ECONOMIC WEATHER SERVICES								582 6	582 6
1500 CANADIAN FORCES WEATHER SERVICES								6178 0	6178 0
2000 DATA ACQUISITION							3475 1	15707 1	19182 2
0 WEATHER SERVICES SUPPORT SYSTEMS			1398 7		4339 0		7218 9	22332 3	35288 9
	TOTAL		1398 7		4339 0		10694 0	74699 9	91131 6
4 CLIMATE SERVICES & RESEARCH									
4100 CLIMATE SERVICES						3409 5	126 3	1663 5	5199 3
4500 CLIMATE RESEARCH AND DEVELOPMENT					374 1	2162 7			2536 8
4600 CLIMATE SERVICES SUPPORT SYSTEMS						577 9	1389 6	466 0	2433 5
4700 CANADIAN CLIMATE PROGRAM						88 6			88 6
	TOTAL				374 1	6238 7	1515 9	2129 5	10258 2
5 ICE SERVICES									
5100 ICE RECONNAISSANCE & DATA ACQUISITION							1820 0		1820 0
5200 ICE ANALYSIS & FORECASTING							1185 3		1185 3
5300 ICE CLIMATE SERVICES							212 0		212 0
5400 ICE SERVICES SUPPORT SYSTEM							161 0		161 0
5500 RESEARCH AND DEVELOPMENT -ICE							276 0		276 0
	TOTAL						3654 3		3654 3
6000 AIR QUALITY SERVICES & RESEARCH									
6100 AIR QUALITY SERVICES					399 2			833 7	1232 9
6300 AIR QUALITY RESEARCH		397 0			4403 0			126 9	4926 9
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES					726 3				726 3
	TOTAL	397 0			5528 5			960 6	6886 1
GRAND TOTAL		1646 0	3965 5	1725 0	10241 6	6238 7	15864 2	77790 0	117471 0

ATMOSPHERIC ENVIRONMENT SERVICE
1989-90 BUDGET
($000)

5 1 5 O&M BY PROGRAM ACTIVITY AND ORGANIZATION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		ADMA	AABD	AHRD	ARD	CCC	CSD	WSD	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES									
0810 MANAGEMENT		301 7	384 0						685 7
0830 COMMON SUPPORT SERVICES			844 7	346 4					1191 1
	TOTAL	301 7	1228 7	346 4					1876 8
1000 WEATHER SERVICES									
1100 PUBLIC WEATHER SERVICES								1753 2	1753 2
1200 MARINE WEATHER SERVICES								209 4	209 4
1300 AVIATION WEATHER SERVICES								532 7	532 7
1400 ECONOMIC WEATHER SERVICES								38 0	38 0
1500 CANADIAN FORCES WEATHER SERVICES								375 0	375 0
2000 DATA ACQUISITION							586 5	17096 5	17683 0
3000 WEATHER SERVICES SUPPORT SYSTEMS			1970 7		1945 3		15886 8	10005 4	29808 2
	TOTAL		1970 7		1945 3		16473 3	30010 2	50 5
4000 CLIMATE SERVICES & RESEARCH									
4100 CLIMATE SERVICES						632 0	35 0	1056 4	1723 4
4500 CLIMATE RESEARCH AND DEVELOPMENT					249 0	721 0			970 0
4600 CLIMATE SERVICES SUPPORT SYSTEMS			100 0			397 5	2132 7	90 6	2720 8
4700 CANADIAN CLIMATE PROGRAM						803 0			803 0
	TOTAL		100 0		249 0	2553 5	2167 7	1147 0	6217 2
5000 ICE SERVICES									
5100 ICE RECONNAISSANCE & DATA ACQUISITION							12699 0		12(0
5200 ICE ANALYSIS & FORECASTING							2194 0		2194 0
5300 ICE CLIMATE SERVICES							97 8		97 8
5400 ICE SERVICES SUPPORT SYSTEM			120 0				190 0		310 0
5500 RESEARCH AND DEVELOPMENT -ICE							445 0		445 0
	TOTAL		120 0				15625 8		15745 8
6000 AIR QUALITY SERVICES & RESEARCH									
6100 AIR QUALITY SERVICES			225 0		207 0			7 8	439 8
6300 AIR QUALITY RESEARCH		79 0			3693 8			107 1	3879 9
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES					629 0				629 0
	TOTAL	79 0	225 0		4529 8			114 9	4948 7
GRAND TOTAL		380 7	3644 4	346 4	6724 1	2553 5	34266 8	31272 1	79188 0

ATMOSPHERIC ENVIRONMENT SERVICE
1989-90 BUDGET
($000)

5 1 6 CAPITAL BY PROGRAM ACTIVITY AND ORGANIZATION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		ADMA	AABD	AHRD	ARD	CCC	CSD	WSD	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES									
0810 MANAGEMENT		2 0	1405 0						1407 0
0830 COMMON SUPPORT SERVICES			190 0	4 0					194 0
	TOTAL	2 0	1595 0	4 0					1601 0
1000 WEATHER SERVICES									
1100 PUBLIC WEATHER SERVICES								40 0	40 0
1200 MARINE WEATHER SERVICES									
1300 AVIATION WEATHER SERVICES									
1400 ECONOMIC WEATHER SERVICES									
1500 CANADIAN FORCES WEATHER SERVICES									
2000 DATA ACQUISITION							8700 6	3116 6	11817 4
3000 WEATHER SERVICES SUPPORT SYSTEMS			2365 0		1123 0		2691 9	3327 9	9507 8
	TOTAL		2365 0		1123 0		11392 5	6484 5	21365 0
4000 CLIMATE SERVICES & RESEARCH									
4100 CLIMATE SERVICES						419 0		13 0	432 0
4500 CLIMATE RESEARCH AND DEVELOPMENT					285 0	114 0			399 0
4600 CLIMATE SERVICES SUPPORT SYSTEMS						202 0	35 0	6 5	243 5
4700 CANADIAN CLIMATE PROGRAM									
	TOTAL				285 0	735 0	35 0	19 5	1074 5
5000 ICE SERVICES									
5100 ICE RECONNAISSANCE & DATA ACQUISITION							3025 0		3025 0
5200 ICE ANALYSIS & FORECASTING							574 9		574 9
5300 ICE CLIMATE SERVICES							47 0		47 0
5400 ICE SERVICES SUPPORT SYSTEM							5 0		5 0
5500 RESEARCH AND DEVELOPMENT -ICE							1366 6		1366 6
	TOTAL						5018 5		5018 5
6000 AIR QUALITY SERVICES & RESEARCH									
6100 AIR QUALITY SERVICES					490 0			10 0	500 0
6300 AIR QUALITY RESEARCH					1682 0				1682 0
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES					192 0				192 0
	TOTAL				2364 0			10 0	2374 0
GRAND TOTAL		2 0	3960 0	4 0	3772 0	735 0	16446 0	6514 0	31433 0

ATMOSPHERIC ENVIRONMENT SERVICE
1989-90 BUDGET
($000)

5 1 7 GRANTS AND CONTRIBUTIONS BY PROGRAM ACTIVITY AND ORGANIZATION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		ADMA	AABD	AHRD	ARD	CCC	CSD	WSD	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES									
0810 MANAGEMENT									
0830 COMMON SUPPORT SERVICES									
	TOTAL								
1000 WEATHER SERVICES									
1100 PUBLIC WEATHER SERVICES									
1200 MARINE WEATHER SERVICES									
1300 AVIATION WEATHER SERVICES									
1400 ECONOMIC WEATHER SERVICES									
1500 CANADIAN FORCES WEATHER SERVICES									
2000 DATA ACQUISITION									
3000 WEATHER SERVICES SUPPORT SYSTEMS			1195 0		280 0		100 0		1575 0
	TOTAL		1195 0		280 0		100 0		1575 0
4000 CLIMATE SERVICES & RESEARCH									
4100 CLIMATE SERVICES									
4500 CLIMATE RESEARCH AND DEVELOPMENT					200 0				200 0
4600 CLIMATE SERVICES SUPPORT SYSTEMS									
4700 CANADIAN CLIMATE PROGRAM									
	TOTAL				200 0				0
5000 ICE SERVICES									
5100 ICE RECONNAISSANCE & DATA ACQUISITION									
5200 ICE ANALYSIS & FORECASTING									
5300 ICE CLIMATE SERVICES									
5400 ICE SERVICES SUPPORT SYSTEM									
5500 RESEARCH AND DEVELOPMENT -ICE									
	TOTAL								
6) AIR QUALITY SERVICES & RESEARCH									
6100 AIR QUALITY SERVICES									
6300 AIR QUALITY RESEARCH					314 0				314 0
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES									
	TOTAL				314 0				314 0
GRAND TOTAL			1195 0		794 0		100 0		0

1989-90 Budget
($000)

ATMOSPHERIC ENVIRONMENT SERVICE

5 1 8 BY ORGANIZATIONAL UNIT

	PY	SALARY	O&M	CAPITAL	G&C	TOTAL
OFFICE OF ASSISTANT DEPUTY MINISTER	30 0	1646 0	380 7	2 0		2028 7
FINANCE AND ADMINISTRATION BRANCH	99 0	3965 5	3644 4	3960 0	1195 0	12764 9
ATMOSPHERIC RESEARCH DIRECTORATE	180 0	10241 6	6724 1	3772 0	794 0	21531 7
CANADIAN CLIMATE CENTRE	127 0	6238 7	2553 5	735 0		9527 2
CENTRAL SERVICES DIRECTORATE	326 0	15864 2	34266 8	16446 0	100 0	66677 0
WEATHER SERVICES DIRECTORATE	1503 0	71612 0	30897 1	6514 0		109023 1
CANADIAN FORCES WEATHER SERVICES	108 0	6178 0	375 0			6553 0
HUMAN RESOURCES BRANCH	36 0	1725 0	346 4	4.0		2075 4
AES TOTAL	2409 0	117471 0	79188 0	31433 0	2089 0	230181 0

1989-90 Budget
($000)

5 1 9 ATMOSPHERIC ENVIRONMENT SERVICE

RECONCILIATION TO MAIN ESTIMATES

AND NET REFERENCE LEVEL

1)	Allocated Within AES (Total in Program Digest)	$230,181 0
2)	Plus Employee Fringe Benefits	17,597 0
3)	Main Estimates (Blue Book)	247,778 0
4)	Less Vote Netted Revenue	31,655 0
5)	Less Non-tax Revenue	1,800 0
6)	1989/90 Net Reference Level	$214,323 0

5 1 10 AES MAIN ESTIMATES BY ORGANIZATION AND INPUT FACTOR (1989/90)

	ADMA	AABD	ACDG	CCDG	ARDG	AWDG	CFWS	AHRD	TOTAL
P-Ys	30 0	99 0	326 0	127 0	180 0	1503 0	108 0	36 0	2409 0
SALARY	1603 4	2450 5	14722 2	6188 7	9871 6	61869 0	5743 0	1440 0	103931 0
OVERTIME	40 0	40 0	962 0	50 0	310 0	8053 0	175 0	10 0	9600 0
OPC	0 0	1475 0	180 0	0 0	60 0	1690 0	260 0	275 0	3940 0
CEBP	246 9	594 8	2379 6	935 8	1536 2	10742 0	926 7	235 0	17597 0
O&M	380 7	3644 4	34266 8	2553 5	6724 1	30897 1	375 0	346 4	79188 0
CAPITAL	2 0	3960 0	16446 0	735 0	3772 0	6514 0	0 0	4 0	31443 0
GRTS & CONTR	0 0	1195 0	100 0	0 0	794 0	0 0	0 0	0 0	2089 0
TOTALS (1)	2275 6	13359 7	69056 6	10463 0	23067 9	119865 1	7479 7	2310 4	247778 0

NOTES

(1) VNR included - see next page for details

OPC - Other Personnel Costs
CEBP - Employee Fringe Benefits

5 1 11 VOTE NETTED REVENUE ALLOCATIONS (1989/90)

SALARY
(000's $)

	ADMA	ACDG	CCDG	AABD	ARDG	AWDG	CFWS	TOTAL ($000)	P-Ys
DOT-MARINE		1610 0						1610 0	31 0
TCAG						7149 8		7149 8	146 0
EM&R						73 8		73 8	
DND							6178 0	6178 0	108 0
UNALLOCATED				19 4				19 4	
TOTAL SAL	0 0	1610 0	0 0	19 4	0 0	7223 6	6178 0	15031 0	285 0

NON-SALARY
(000's $)

DOT-MARINE		12680 0						12680 0	
DOT-AIR		360 7				2708 3		3069 0	
EM&R						75 0		75 0	
DND							375 0	375 0	
MISC		150 0	25 0	150 0		100 0		425 0	
TOTAL O&M	0 0	13190 7	25 0	150 0	0 0	2883 3	375 0	16624 0	
TOTAL VNR (000's $)	0 0	14800 7	25 0	169 4	0 0	10106 9	6553 0	31655 0	285 0

ATMOSPHERIC ENVIRONMENT SERVICE

5 1 12 PERSON-YEARS BY ORGANIZATION AND BY LOCATION

(TOTAL 2409 0)

	Location	Region or Branch	Directorate
OFFICE OF THE ASSISTANT DEPUTY MINISTER			30 0
Downsview, Ont	16 0		
Hull, Que	14 0		
FINANCE AND ADMINISTRATION		99 0	99 0
Downsview, Ont	99 0		
HUMAN RESOURCES BRANCH		36 0	36 0
Downsview, Ont	36 0		
ATMOSPHERIC RESEARCH DIRECTORATE			180 0
Director General's Office		9 5	
Downsview, Ont	9 5		
Air Quality and Inter-Environmental Research Branch		91 5	
Downsview, Ont	90 5		
Victoria, B C	1.0		
Meteorological Services Research Branch		79 0	
Dorval, Que	20 0		
Downsview, Ont	59 0		
CANADIAN CLIMATE CENTRE			127 0
Director General's Office		8 0	
Downsview, Ont	8.0		
Research Components		23 0	
Downsview, Ont	23 0		
Climatological Applications Branch		96 0	
Downsview, Ont	88 0		
Saskatoon, Sask	8 0		
CENTRAL SERVICES DIRECTORATE			326 0
Director General's Office		4 0	
Downsview, Ont	4 0		
Computing and Telecommunications Branch		105 5	
Dorval, Que	34 0		
Downsview, Ont	71 5		
Data Acquisition Systems Branch		78 0	
Downsview, Ont	78 0		
Ice Branch		68 5	
Downsview, Ont	35 5		
Ottawa, Ont	33 0		
Training Branch		70 0	
Cornwall, Ont	32 0		
Downsview, Ont	30 0		
Montreal, Que	8 0		

	Station Type *	Location	Region or Branch	Directorate
WEATHER SERVICES DIRECTORATE				
Toronto (Downsview), Ontario				1503 0
- Directors General's Office			17 5	
Program Branch			50 0	
Montreal (Dorval), Quebec				
- Canadian Meteorological Centre			92 2	
Atlantic Region			224 2	
Charlottetown, P E I	W04	4 0		
Churchill Falls, Labrador	WS3	4 0		
Fredericton, N B	W04	5 0		
Gander, NFLD				
- Newfoundland Weather Centre	W01/W04	38 0		
Halifax, N S (Bedford)				
- Regional Headquarters		87 2		
- Maritmes Weather Centre	W01/W04	43 0		
Moncton, N B	W04	8 0		
Sable Island, N S	WS1	6 0		
Saint John, N B	W04	5 0		
St John's, Nfld	W04	10 0		
Stephenville, Nfld	WS2	3 0		
Sydney, N S	W04	6 0		
Yarmouth, N S	W04	5 0		
Quebec Region			207 8	
Baie Comeau, Que	WS3	5 0		
Cape Dyer, N W T	WS3	3 0		
Chibougamau, Que	WS3	5 0		
Iqaluit, N W T	W04/WS2	6 0		
Inukjuak, N W T	WS1	5 0		
Kuujjuaq, Que	WS2	3 0		
La Grande IV, Que	WS1	4 0		
Maniwaki, Que	WS1	5 0		
Mirabel, Que	W04/WS3	7 0		
Montreal, Que				
- Regional Headquarters (Ville St Laurent)		62 2		
- Quebec Weather Centre (Ville St Laurent)	W01	61 0		
- International Airport Weather Office (Dorval)	W04	13 0		
- International Airport Weather Station (Dorval)	WS3	5 0		
Quebec City, Que	W04	6 8		
Sept-Iles, Que	W04	2 8		
Sherbrooke, Que	W04	2 0		
St Hubert, Que	W04	5 0		
Trois Rivieres, Que	W04	1 0		
Val d'Or, Que	W04	6 0		

* See page 82 for definitions of station types

	Station Type *	Location	Region or Branch	Directorate
Ontario region			198 7	
Hamilton, Ont	W04	4 0		
Kingston, Ont	W04	3 0		
London, Ont	W04	5 0		
Moosonee, Ont	WS1	4 0		
Niagara District, Ont	W04	2 0		
North Bay, Ont	W04	2 0		
Ottawa, Ont	W04	9 5		
Peterborough, Ont	W04	2 0		
Sarnia, Ont	W04	2 0		
Sault Ste Marie, Ont	W04	6 0		
Sudbury, Ont	W04	6 0		
Thunder Bay, Ont	W04	7 0		
Toronto, Ont				
- Regional Headquarters		67 2		
- Ontario Weather Centre	W01	35 0		
- International Airport Weather Office	W04	28 0		
Big Trout Lake, Ont	WS1	7 0		
Waterloo-Wellington, Ont	W04	2 0		
Windsor, Ont	W04	7 0		
Central Region			249 2	
Alert, N W T	WS1	4.0		
Baker Lake, N W T	WS2	2 0		
Brandon, Man	W04	1 0		
Broadview, Sask	WS3	5 0		
Churchill, Man	W04/WS2	7 0		
Cree Lake, Sask	WS3	4 0		
Dauphin, Man	W04	1 0		
Estevan, Sask	WS3	4 0		
Elbow, Sask	WS3	2 0		
Eureka, N W T	WS1	8 0		
Gillam, Man	WS3	1 0		
Gimli, Man	WS3	1 0		
Hall Beach, N W T	WS1	5 0		
Hudson Bay, Sask	WS3	1 0		
Kindersley, Sask	WS3	1 0		
Mould Bay, N W T	WS1	7 0		
Prince Albert, Sask	W04	3 0		
Regina, Sask	W03	12 0		
Resolute, N W T	W04/WS2	6 0		

* see page 82 for definitions of station types

	Station Type *	Location	Region or Branch	Directorate
Saskatoon, Sask	WO3	11 0		
The Pas, Man	WS1	6 0		
Thompson, Man	WO4	1 0		
Winnipeg, Man				
- Regional Headquarters		77 2		
- Prairie Weather Centre	WO1	59 0		
- International Airport Weather Office	WO4	19 0		
Wynyard, Sask	WS3	1 0		
Western Region			264 2	
Banff, Alta	WO4	3 0		
Calgary, Alta	WO4	16 0		
Cambridge Bay, N W T	WS1	7 0		
Cape Parry, N W T	WS3	3 0		
Coronation, Alta	WS3	1 0		
Edmonton, Alta				
- Regional Headquarters		85 2		
- Alberta Weather Centre	WO1/WO4	31 0		
- Arctic Weather Centre	WO1/WO4	31 0		
- International Airport Weather Office	WO4	6 0		
- Municipal Airport Weather Office	WO4	5 0		
Edson, Alta	WS3	4 0		
Fort McMurray, Alta	WS3	3 0		
Fort Reliance, N W T	WS3	3 0		
Fort Smith, N W T	WS2	3 0		
Grande Prairie, Alta	WO4	4 0		
Inuvik, N W T	WO4/WS2	8 0		
Jasper, Alta	WS3	3 0		
Lethbridge, Alta	WO4	5 0		
Norman Wells, N W T	WS2	3 0		
Pincher Creek, Alta	WS3	1 0		
Rocky Mountain House, Alta	WS3	3 0		
Slave Lake, Alta	WS3	4 0		
Stony Plain, Alta	WS2	4 0		
Whitehorse, Yukon				
- Yukon Weather Centre	WO1/WO4	18 0		
- Weather Station	WS2	4 0		
Yellowknife, N W T	WO3	6 0		

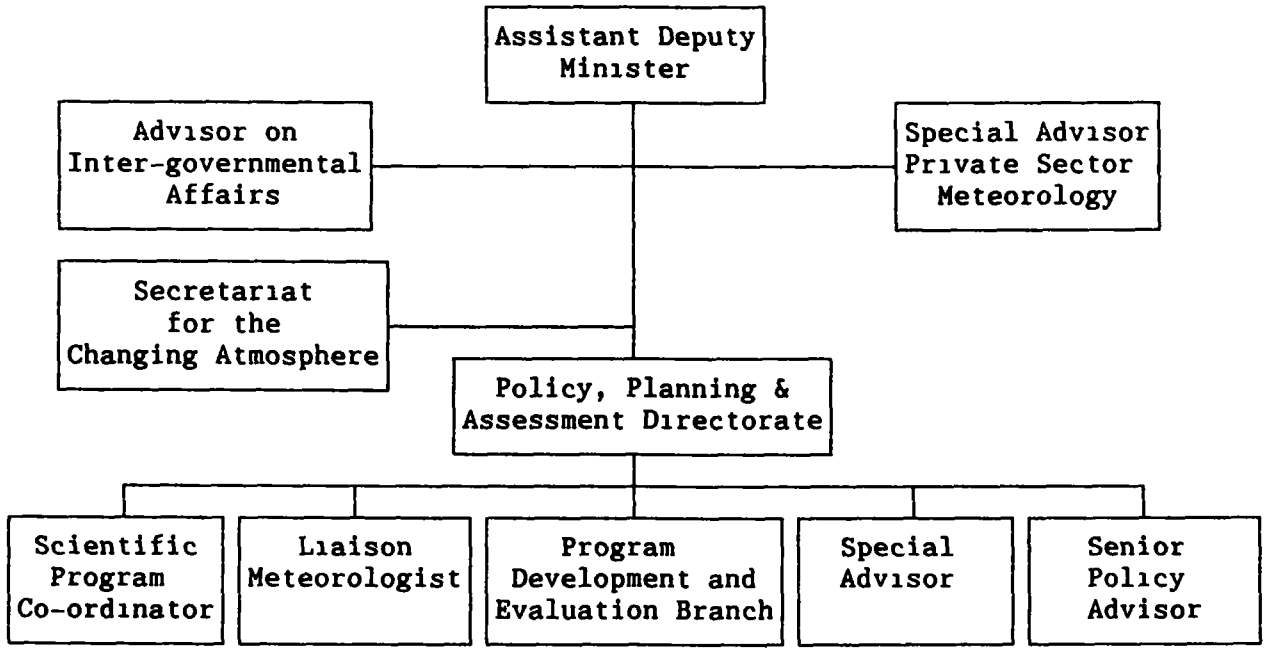
* see page 82 for definitions of station types

	Station Type *	Location	Region or Branch	Directorate
Pacific Region			199 2	
Cape St James, B C	WS3	3 0		
Castlegar, B C	WO4	3 0		
Dease Lake, B C	WS3	2 0		
Fort St John, B C	WO4	3 0		
Fort Nelson, B C	WO4/WS2	4 0		
Hope, B C	WS3	3 0		
Kamloops, B C	WO4	4 0		
Kelowna, B C	WO4	7 0		
Lytton, B C	WS3	3 0		
Penticton, B C	WO4	2 0		
Port Alberni, B C	WS3	2 0		
Port Hardy, B C	WS2/WO4	5 0		
Prince George, B C	WS2/WO4	8 0		
Revelstoke, B C	WS3	3 0		
Terrace, B C	WO4	3 0		
Vancouver, B C				
- Regional Headquarters		79 2		
- Pacific Weather Centre	WO1	34 0		
- Lower Mainland Weather Office	WO4	13 0		
- International Airport Weather Station	WS3	6 0		
Vernon, B C	WS2	3 0		
Victoria, B C				
- Weather Office	WO3	9.0		
CANADIAN FORCES WEATHER SERVICE			108.0	108 0
AES TOTAL				2409 0

Station types

WO1 - a primary forecast office which provides forecasts, consultation and in some cases, presentation services
WO3 - provides consultation and presentation services to a wide variety of users, in addition to taking surface weather observations
WO4 - provides presentation services to a wide variety of users, in addition to taking surface weather observations
WS1 - takes both surface and upper air (radiosonde and rawinsonde) observations and provides weather information service
WS2 - takes upper air observations
WS3 - maintains a full or partial surface observing program, with observations taken by AES technicians and provides weather information service

5 2 OFFICE OF THE ASSISTANT DEPUTY MINISTER



5 2 1 FUNCTIONS OF THE OFFICE OF THE ADM (30 0 PY, $2,028 7 K)

The Assistant Deputy Minister (ADM)

- provides executive direction to, and management of, the Atmospheric Environment Service,
- participates in the corporate executive management of Environment Canada, and
- represents Canada on the executive governing body of the World Meteorological Organization of the United Nations

The Director General of the Policy, Planning, and Assessment Directorate, who reports to the ADM

- is responsible for Service-wide policy, planning, scientific co-ordination, program development, program evaluation and program integration, and
- co-ordinates the preparation of a variety of documents for senior management consideration, including documents for the Minister and Deputy Minister of the Department, and for Central Agencies

The Director of the Secretariat for the Changing Atmosphere, reporting to the ADM

- assists in planning and coordinating federal response activities related to changing atmosphere issues (e g , acid precipitation, climate change and stratospheric ozone),
- plans and implements the scientific advisory and coordination service to support the ADM's responsibilities in changing atmosphere issues including the interdepartmental LRTAP Committee and the UN Intergovernmental Panel on Climate Change (IPCC),
- Providing briefing material to the ADM and other senior officials, and
- acting as a Government media contact relating to scientific, policy and research aspects of changing atmosphere issues

There are two additional functions of the office of the ADM

- international affairs co-ordination, secretarial services to management committee and travel plan co-ordination, and
- private sector liaison

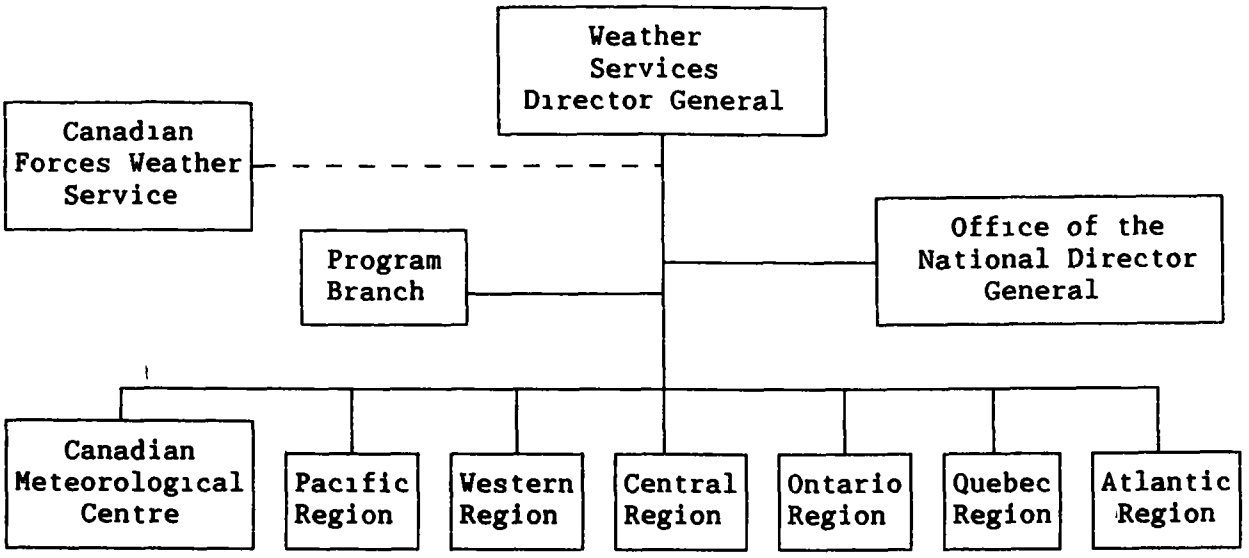
ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

OFFICE OF THE ASSISTANT DEPUTY MINISTER

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
0810 MANAGEMENT	22 0	1249 0	301 7	2 0		1552 7
0830 COMMON SUPPORT SERVICES						
TOTAL	22 0	1249 0	301 7	2 0		1552 7
1000 WEATHER SERVICES						
4000 CLIMATE SERVICES & RESEARCH						
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
6100 AIR QUALITY SERVICES						
6300 AIR QUALITY RESEARCH	8 0	397 0	79 0			476 0
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES						
TOTAL	8 0	397 0	79 0			476 0
GRAND TOTAL	30 0	1646 0	380 7	2 0		2028 7

5 3 WEATHER SERVICES DIRECTORATE



5 3 1 FUNCTIONS WEATHER SERVICES DIRECTORATE (1503 0 PY, $109,023 1 K)

This Directorate is the largest in AES It employs 62% of the total staff It is responsible for all Regional activities, including data acquisition, the forecast production program and the dissemination of weather information to the general public The National Director General is supported in Downsview by the Office of the Director General and the Program Branch Others reporting to the Director General are the Regional Directors-General of the six Regions of the AES Pacific, Western, Central, Ontario, Quebec and Atlantic Regions, and the Director of the Canadian Meteorological Centre (CMC) in Montreal

Office of the Director General (17 5 PY, $3,465 0 K)

This office supports the National Director General in the day to day national management of the operations of the Directorate In this role this office

- provides national human resources management services including training requirements with respect to meteorologists and meteorological technicians,
- takes part in national operational activities such as Broadcast News/Canadian Press relationships, the Volunteer Observing Ships program, the national forecast translation system, publications of brochures, etc ,
- prepares and/or manages the preparation of correspondence in order to present directorate responses, positions or requests on operational matters including letters for Ministerial signature and senior management briefing notes,

- provides support for meetings chaired or attended by the Director General and co-ordinates national meetings of regional managers, and
- provides general administrative support services for the Directorate

Program Branch (50 0 PY, $4,478 0 K)

The Program Branch supports the National Director General in the development, control and management of change to Directorate national operations, and the monitoring and assessment of trends in Directorate operations and outputs The Branch has the following composition

Policy and Plans Division
- develops national plans and policies for the WSD responsibilities for data acquisition, weather forecasting and dissemination activities, and
- develops and maintains DOE/AES agreements and relationships with components of other departments such as Transport, National Defence, and Fisheries and Oceans

Procedures and Standards Division
- develops the procedures and standards to be used in the WSD activities of data acquisition, weather forecasting and dissemination, and
- maintains the meteorological applications Common Computer Programs (CCP) programs used in the weather centres

Monitoring and Assessment Division
- monitors and assesses the outputs of the Weather Services program and the operations used to produce them, and
- develops and maintains a management information system for WSD

Financial Services Unit
- provides financial analysis and advice on WSD proposals for the Weather Services program;
- provides guidance and advice on financial procedures, and
- prepares resource allocations for the Directorate and monitors expenditures

Canadian Meteorological Centre (92 2 PY, $6,867 2 K)

The Canadian Meteorological Centre, as described on page 31, is made up of two divisions - the Operations Division and Development Division

The Operations Division
- assimilates data into operational runs,
- prepares subjective products,
- implements and maintains the computerized production system, and
- monitors and evaluates automated and manual output

The Development Division
- improves the quality and range of forecast products, and
- provides efficient production systems

Pacific, Western, Central, Ontario, Quebec and Atlantic Regions
(1343 3 PY, 94,212 9 K)

The six regions within AES provide weather services to all Canadians Although each region is similar in structure and responsibilities, they differ in their geographical coverage and regional needs Each of the regions has four operational divisions

1) Data Aquisition
   - provides weather data (see page 29) as inputs to the AES forecast operation systems and the Canadian Climate programs,
   - provides other environmental data on air quality, atmospheric ozone, soil temperatures etc ,
   - administers contract weather observation stations,
   - ensures that meteorological instruments are properly maintained and calibrated, and
   - trains volunteer and contract station observers

2) Weather Forecasting·
   - produces regional weather forecasts and weather warnings based on all incoming weather data The forecasts are prepared for use by the public and for use by aviation, marine and various other interests, and

3) Weather Services
   - provides weather information to Canadians using Weatheradio Canada, the media, telephones and personal contacts, and
   - ensures that the regional needs for weather services are met

4) Scientific Services
   - studies regional meteorological problems related to agriculture, forestry, air quality, energy applications and hydrometeorology, and studies the regional impact of climate change on these activities,
   - acts as the focal point for AES regional participation in environmental assessment,
   - controls the quality of climatological data in the region, and
   - provides climatological data to users

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

WEATHER SERVICES DIRECTORATE

SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES							
1000 WEATHER SERVICES							
1100 PUBLIC WEATHER SERVICES		468 4	22516 3	1753 2	40 0		24309 5
1200 MARINE WEATHER SERVICES		19 0	993 8	209 4			1203 2
1300 AVIATION WEATHER SERVICES		135 5	6389 8	532 7			6922 5
1400 ECONOMIC WEATHER SERVICES		13 4	582 6	38 0			620 6
1500 CANADIAN FORCES WEATHER SERVICES							
2000 DATA ACQUISITION		362 5	15707 1	17096 5	3116 6		35920 2
3000 WEATHER SERVICES SUPPORT SYSTEMS		436 7	22332 3	10005 4	3327 9		35665 6
	TOTAL	1435 5	68521 9	29635 2	6484 5		104641 6
4000 CLIMATE SERVICES & RESEARCH							
4100 CLIMATE SERVICES		40 3	1663 5	1056 4	13 0		2732 9
4500 CLIMATE RESEARCH AND DEVELOPMENT							
4600 CLIMATE SERVICES SUPPORT SYSTEMS		11 2	466 0	90 6	6 5		563 1
4700 CANADIAN CLIMATE PROGRAM							
	TOTAL	51 5	2129 5	1147 0	19 5		3296 0
5000 ICE SERVICES							
6000 AIR QUALITY SERVICES & RESEARCH							
6100 AIR QUALITY SERVICES		13 8	833 7	7 8	10 0		851 5
6300 AIR QUALITY RESEARCH		2 2	126 9	107 1			234 0
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES							
	TOTAL	16 0	960 6	114 9	10 0		1085 5
GRAND TOTAL		1503 0	71612 0	30897 1	6514 0		109023 1

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

OFFICE OF THE DIRECTOR GENERAL-WSD

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES		1029 5	100 0			1129 5
1200 MARINE WEATHER SERVICES						
1300 AVIATION WEATHER SERVICES						
1400 ECONOMIC WEATHER SERVICES						
1500 CANADIAN FORCES WEATHER SERVICES						
2000 DATA ACQUISITION	2 0	97 2	280 0			377 2
3000 WEATHER SERVICES SUPPORT SYSTEMS	15 5	1010 5	788 0	159 8		1958 3
TOTAL	17 5	2137 2	1168 0	159 8		3465 0
4000 CLIMATE SERVICES & RESEARCH						
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	17 5	2137 2	1168 0	159 8		3465 0

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

WEATHER SERVICES PROGRAM BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES						
1200 MARINE WEATHER SERVICES						
1300 AVIATION WEATHER SERVICES						
1400 ECONOMIC WEATHER SERVICES						
1500 CANADIAN FORCES WEATHER SERVICES						
2000 DATA ACQUISITION	5 0	230 7	70 0			300 7
3000 WEATHER SERVICES SUPPORT SYSTEMS	45 0	2238 7	717 4	1221 2		4177 3
TOTAL	50 0	2469 4	787 4	1221 2		4478 0
4000 CLIMATE SERVICES & RESEARCH						
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	50 0	2469 4	787 4	1221 2		4478 0

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

CANADIAN METEOROLOGICAL CENTRE

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES	7 0	283 0	62 0			345 0
1200 MARINE WEATHER SERVICES						
1300 AVIATION WEATHER SERVICES						
1400 ECONOMIC WEATHER SERVICES						
1500 CANADIAN FORCES WEATHER SERVICES						
2000 DATA ACQUISITION						
3000 WEATHER SERVICES SUPPORT SYSTEMS	84 2	5633 9	720 6	97 7		6452 2
TOTAL	91 2	5916 9	782 6	97 7		6797 2
4000 CLIMATE SERVICES & RESEARCH						
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
6100 AIR QUALITY SERVICES	1 0	70 0				70 0
6300 AIR QUALITY RESEARCH						
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES						
TOTAL	1 0	70 0				70 0
GRAND TOTAL	92 2	5986 9	782 6	97 7		6867 2

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

PACIFIC REGION

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES	68 0	2993 9	144 2			3138 1
1200 MARINE WEATHER SERVICES	6 0	341 6	93 9			435 5
1300 AVIATION WEATHER SERVICES	23 0	1091 5	24 3			1115 8
1400 ECONOMIC WEATHER SERVICES	1 0	58 2	23 0			81 2
1500 CANADIAN FORCES WEATHER SERVICES						
2000 DATA ACQUISITION	46 0	1935 7	2841 1	758 5		5535 3
3000 WEATHER SERVICES SUPPORT SYSTEMS	46 0	2033 8	1513 3	450 0		3997 1
TOTAL	190 0	8454 7	4639 8	1208 5		14303 0
4000 CLIMATE SERVICES & RESEARCH						
4100 CLIMATE SERVICES	6 0	216 7	208 0	5 0		429 7
4500 CLIMATE RESEARCH AND DEVELOPMENT						
4600 CLIMATE SERVICES SUPPORT SYSTEMS	1 0	53 2	19 1			72 3
4700 CANADIAN CLIMATE PROGRAM						
TOTAL	7 0	269 9	227 1	5 0		502 0
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
6100 AIR QUALITY SERVICES	2 2	133 0	3 3			136 3
6300 AIR QUALITY RESEARCH						
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES						
TOTAL	2 2	133 0	3 3			136 3
GRAND TOTAL	199 2	8857 6	4870 2	1213 5		14941 3

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

WESTERN REGION

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES	80 0	3636 5	341 2			3977 7
1200 MARINE WEATHER SERVICES	1 0	52 6				52 6
1300 AVIATION WEATHER SERVICES	39 0	1823 9	114 4			1938 3
1400 ECONOMIC WEATHER SERVICES						
1500 CANADIAN FORCES WEATHER SERVICES						
) DATA ACQUISITION	77 0	3195 7	1656 6			4852 3
) WEATHER SERVICES SUPPORT SYSTEMS	56 5	2527 5	2213 1	631 8		5372 4
TOTAL	253 5	11236 2	4325 3	631 8		16193 3
4000 CLIMATE SERVICES & RESEARCH						
4100 CLIMATE SERVICES	6 5	263 9	79 5			343 4
4500 CLIMATE RESEARCH AND DEVELOPMENT						
4600 CLIMATE SERVICES SUPPORT SYSTEMS	2 0	83 3	26 3			109 6
4700 CANADIAN CLIMATE PROGRAM						
TOTAL	8 5	347 2	105 8			453 0
5000 ICE SERVICES						
6 AIR QUALITY SERVICES & RESEARCH						
6100 AIR QUALITY SERVICES	1 0	70 0				70 0
6300 AIR QUALITY RESEARCH	1 2	84 5	1 0			85 5
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES						
TOTAL	2 2	154 5	1 0			155 5
GRAND TOTAL	264 2	11737 9	4432 1	631 8		16801 8

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

CENTRAL REGION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES							
1000 WEATHER SERVICES							
1100 PUBLIC WEATHER SERVICES		68 0	2976 1	284 5	5 0		3265 6
1200 MARINE WEATHER SERVICES							
1300 AVIATION WEATHER SERVICES		11 0	523 8				523 8
1400 ECONOMIC WEATHER SERVICES		4 0	163 4				163 4
1500 CANADIAN FORCES WEATHER SERVICES							
2000 DATA ACQUISITION		98 0	4290 8	5380 1	690 0		10360 9
3000 WEATHER SERVICES SUPPORT SYSTEMS		55 0	2351 1	1245 1	327 5		3923 7
	TOTAL	236 0	10305 2	6909 7	1022 5		18237 4
4000 CLIMATE SERVICES & RESEARCH							
4100 CLIMATE SERVICES		9 0	356 8	101 2			458 0
4500 CLIMATE RESEARCH AND DEVELOPMENT							
4600 CLIMATE SERVICES SUPPORT SYSTEMS		2 0	85 4	10 0			95 4
4700 CANADIAN CLIMATE PROGRAM							
	TOTAL	11 0	442 2	111 2			553 4
5000 ICE SERVICES							
6000 AIR QUALITY SERVICES & RESEARCH							
6100 AIR QUALITY SERVICES		2 2	137 3	1 5			138 8
6300 AIR QUALITY RESEARCH							
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES							
	TOTAL	2 2	137 3	1 5			138 8
GRAND TOTAL		249 2	10884 7	7022 4	1022 5		18929 6

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

ONTARIO REGION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES							
1000 WEATHER SERVICES							
1100 PUBLIC WEATHER SERVICES		88 5	3916 3	250 5			4166 8
1200 MARINE WEATHER SERVICES		3 0	149 0				149 0
1300 AVIATION WEATHER SERVICES		15 0	796 0				796 0
1400 ECONOMIC WEATHER SERVICES		2 0	87 0	15 0			102 0
1500 CANADIAN FORCES WEATHER SERVICES							
2000 DATA ACQUISITION		35 5	1563 6	1707 4	166 0		3437 0
3000 WEATHER SERVICES SUPPORT SYSTEMS		41 5	2250 3	817 6	76 7		3144 6
	TOTAL	185 5	8762 2	2790 5	242 7		11795 4
4 CLIMATE SERVICES & RESEARCH							
4100 CLIMATE SERVICES		8 0	310 8	81 4	6 0		398 2
4500 CLIMATE RESEARCH AND DEVELOPMENT							
4600 CLIMATE SERVICES SUPPORT SYSTEMS		3 0	117 4	29 0	6 0		152 4
4700 CANADIAN CLIMATE PROGRAM							
	TOTAL	11 0	428 2	110 4	12 0		550 6
5000 ICE SERVICES							
6 D AIR QUALITY SERVICES & RESEARCH							
6100 AIR QUALITY SERVICES		2 2	127 5	3 0	10 0		140 5
6300 AIR QUALITY RESEARCH							
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES							
	TOTAL	2 2	127 5	3 0	10 0		140 5
GRAND TOTAL		198 7	9317 9	2903 9	264 7		12486 5

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

QUEBEC REGION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES							
1000 WEATHER SERVICES							
1100 PUBLIC WEATHER SERVICES		54 9	2650 3	296 8	35 0		2982 1
1200 MARINE WEATHER SERVICES		1 0	58 0				58 0
1300 AVIATION WEATHER SERVICES		30 5	1336 4	364 0			17 4
1400 ECONOMIC WEATHER SERVICES		5 4	237 4				237 4
1500 CANADIAN FORCES WEATHER SERVICES							
2000 DATA ACQUISITION		66 0	2979 6	2743 9	817 2		6540 7
3000 WEATHER SERVICES SUPPORT SYSTEMS		43 0	2143 1	898 1	245 0		3. 2
	TOTAL	200 8	9404 8	4302 8	1097 2		14804 8
4000 CLIMATE SERVICES & RESEARCH							
4100 CLIMATE SERVICES		3 8	183 3	459 4			642 7
4500 CLIMATE RESEARCH AND DEVELOPMENT							
4600 CLIMATE SERVICES SUPPORT SYSTEMS							
4700 CANADIAN CLIMATE PROGRAM							
	TOTAL	3 8	183 3	459 4			642 7
5000 ICE SERVICES							
6000 AIR QUALITY SERVICES & RESEARCH							
6100 AIR QUALITY SERVICES		2 2	136 4				136 4
6300 AIR QUALITY RESEARCH		1 0	42 4	106 1			148 5
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES							
	TOTAL	3 2	178 8	106 1			284 9
GRAND TOTAL		207 8	9766 9	4868 3	1097 2		15732 4

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

ATLANTIC REGION

SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES							
1 WEATHER SERVICES							
1100 PUBLIC WEATHER SERVICES		102 0	5030 7	274 0			5304 7
12 MARINE WEATHER SERVICES		8 0	392 6	115 5			508 1
1300 AVIATION WEATHER SERVICES		17 0	818 2	30 0			848 2
14 ECONOMIC WEATHER SERVICES		1 0	36 6				36 6
1500 CANADIAN FORCES WEATHER SERVICES							
2(DATA ACQUISITION		33 0	1413 8	2417 4	684 9		4516 1
3000 WEATHER SERVICES SUPPORT SYSTEMS		50 0	2143 4	1092 2	118 2		3353 8
	TOTAL	211 0	9835 3	3929 1	803 1		14567 5
4 CLIMATE SERVICES & RESEARCH							
41 CLIMATE SERVICES		7 0	332 0	126 9	2 0		460 9
45 CLIMATE RESEARCH AND DEVELOPMENT							
4(CLIMATE SERVICES SUPPORT SYSTEMS		3 2	126 7	6 2	0 5		133 4
4700 CANADIAN CLIMATE PROGRAM							
	TOTAL	10 2	458 7	133 1	2 5		594 3
5000 ICE SERVICES							
(0 AIR QUALITY SERVICES & RESEARCH							
6100 AIR QUALITY SERVICES		3 0	159 5				159 5
6300 AIR QUALITY RESEARCH							
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES							
	TOTAL	3 0	159 5				159 5
GRAND TOTAL		224 2	10453 5	4062 2	805 6		15321 3

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

CANADIAN FORCES WEATHER SERVICE

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES						
1200 MARINE WEATHER SERVICES						
1300 AVIATION WEATHER SERVICES						
1400 ECONOMIC WEATHER SERVICES						
1500 CANADIAN FORCES WEATHER SERVICES	108 0	6178 0	375 0			6553 0
2000 DATA ACQUISITION						
3000 WEATHER SERVICES SUPPORT SYSTEMS						
TOTAL	108 0	6178 0	375 0			6553 0
4000 CLIMATE SERVICES & RESEARCH						
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	108 0	6178 0	375 0			6553 0

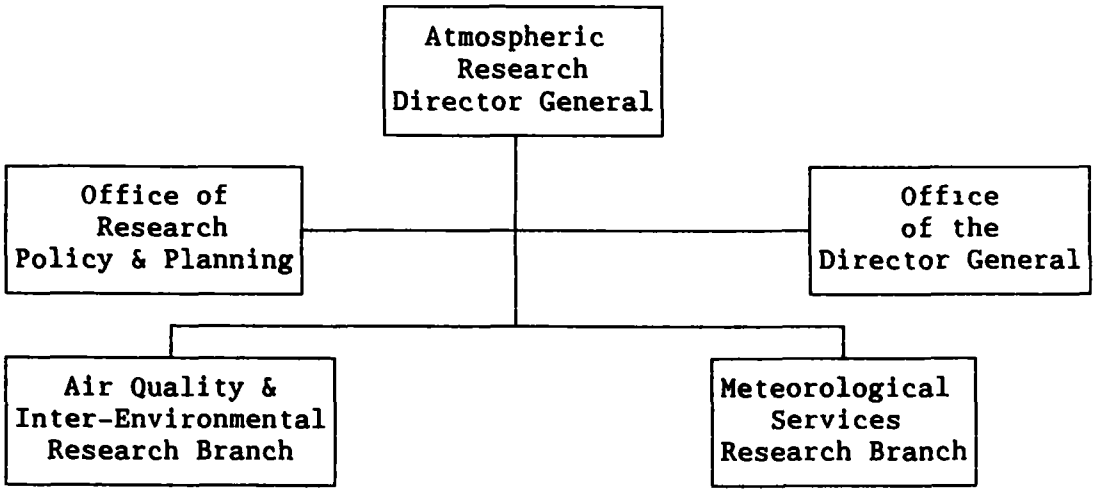
1989-90 Budget
($000)

WEATHER SERVICES DIRECTORATE

5 3 13 BY ORGANIZATIONAL UNIT

	PY	SALARY	O&M	CAPITAL	G&C	TOTAL
OFFICE OF THE DIRECTOR GENERAL	17 5	2137 2	1168 0	159 8	0 0	3465 0
PROGRAM BRANCH	50 0	2469 4	787 4	1221 2	0 0	4478 0
CANADIAN METEOROLOGICAL CENTRE	92 2	5986 9	782 6	97 7	0 0	6867 2
PACIFIC REGION	199 2	8857 6	4870 2	1213 5	0 0	14941 3
WESTERN REGION	264 2	11737 9	4432 1	631 8	0 0	16801 8
CENTRAL REGION	249 2	10884 7	7022 4	1022 5	0 0	18929 6
ONTARIO REGION	198 7	9317 9	2903 9	264 7	0 0	12486 5
QUEBEC REGION	207 8	9766 9	4868 3	1097 2	0 0	15732 4
ATLANTIC REGION	224 2	10453 5	4062 2	805 6	0 0	15321 3
WSD TOTAL	1503 0	71612 0	30897 1	6514 0	0 0	109023 1
CANADIAN FORCES WEATHER SERVICE	108 0	6178 0	375 0	0 0	0 0	6553 0

5 4 ATMOSPHERIC RESEARCH DIRECTORATE



5 4 1 FUNCTIONS ATMOSPHERIC RESEARCH DIRECTORATE (180 0 PY, $21,531 7 K)

Offices of the Director General and Research Policy and Planning
(9 5 PY, $1,547 3 K)

These offices provide the following services

- executive and management direction for ARD,
- long-term direction to Service programs,
- ensures scientific representation of AES nationally and internationally,
- manages Post-Graduate Scholarships and Science Subventions for AES,
- co-ordinates the RES Committee for AES scientists,
- co-ordinates Unsolicited Proposals for AES, and
- 3 PYs for resourcing the assignment of MSc meteorologists to two-year projects in order to develop their ability to carry out research work

Air Quality and Inter-Environmental Research Branch
(91 5 PY, $12,297 1 K)

This Branch analyzes and comprehends the atmospheric chemical and physical environment as it relates to environmental (air) quality This is done by measuring (to ascertain the extent and quality), by studying processes (to understand the method of operation), through integration (combining parts into a whole) and through the provision of services A major part of the above efforts is in support of the Long-Range Transport of Air Pollutants (LRTAP) program, and to monitor and study the stratospheric ozone layer In the future, the Branch will shift its attention toward assessing the significance of the transport and deposition of toxic chemicals, and exploring the linkage between atmospheric composition and climate change

Meteorological Services Research Branch (79 0 PY, $7,687 3 K)

This Branch carries out research and development in support of the prediction services of the AES for weather, sea-state, ice and other environmental elements

The Aerospace Meteorology Division develops systems to receive and exploit data from satellites

La Division de la Recherche en Prevision Numerique located in Dorval, Quebec develops numerical weather forecasting models in support of the forecasting operations at the Canadian Meteorological Centre

Forecast Research Division develops statistical/dynamical models and procedures for forecasting various weather elements and environmental parameters such as sea-state, ice and ice-related variables Also, the Division participates in the development and evaluation of automated systems to support the weather services function of the AES

The Cloud Physics Division remains current in all aspects of cloud and precipitation physics, and weather radar (including precipitation enhancement or suppression, modification of hailstorms, etc) It is also involved in chemical analysis of fog samples and in analysis data from the Canadian Atlantic Storm Program (CASP) carried out in 1986, and will be involved in the 1989 Experiment on Rapid Intensification of Cyclones in the Atlantic (ERICA)

ATMOSPHERIC ENVIRONMENT SERVICE
1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)
ATMOSPHERIC RESEARCH DIRECTORATE

SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES							
1000 WEATHER SERVICES							
1100 PUBLIC WEATHER SERVICES							
1200 MARINE WEATHER SERVICES							
1300 AVIATION WEATHER SERVICES							
1400 ECONOMIC WEATHER SERVICES							
1500 CANADIAN FORCES WEATHER SERVICES							
2000 DATA ACQUISITION							
3000 WEATHER SERVICES SUPPORT SYSTEMS		79 0	4339 0	1945 3	1123 0	280 0	7687 3
	TOTAL	79 0	4339 0	1945 3	1123 0	280 0	7687 3
4000 CLIMATE SERVICES & RESEARCH							
4100 CLIMATE SERVICES							
4500 CLIMATE RESEARCH AND DEVELOPMENT		10 0	374 1	249 0	285 0	200 0	1108 1
4600 CLIMATE SERVICES SUPPORT SYSTEMS							
4700 CANADIAN CLIMATE PROGRAM							
	TOTAL	10 0	374 1	249 0	285 0	200 0	1108 1
5000 ICE SERVICES							
6000 AIR QUALITY SERVICES & RESEARCH							
6100 AIR QUALITY SERVICES		7 5	399 2	207 0	490 0		1096 2
6300 AIR QUALITY RESEARCH		74 0	4403 0	3693 8	1682 0	314 0	10092 8
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES		9 5	726 3	629 0	192 0		1547 3
	TOTAL	91 0	5528 5	4529 8	2364 0	314 0	12736 3
GRAND TOTAL		180 0	10241 6	6724 1	3772 0	794 0	21531 7

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

OFFICE OF THE DIRECTOR GENERAL-ARD

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
4000 CLIMATE SERVICES & RESEARCH						
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
6100 AIR QUALITY SERVICES						
6300 AIR QUALITY RESEARCH						
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES	9 5	726 3	629 0	192 0		1547 3
TOTAL	9 5	726 3	629 0	192 0		1547 3
GRAND TOTAL	9 5	726 3	629 0	192 0		1547 3

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

AIR QUALITY & INTER-ENVIRONMENTAL RESEARCH BR

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
4000 CLIMATE SERVICES & RESEARCH						
4100 CLIMATE SERVICES						
4500 CLIMATE RESEARCH AND DEVELOPMENT	10 0	374 1	249 0	285 0	200 0	1108 1
4600 CLIMATE SERVICES SUPPORT SYSTEMS						
4700 CANADIAN CLIMATE PROGRAM						
TOTAL	10 0	374 1	249 0	285 0	200 0	1108 1
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
6100 AIR QUALITY SERVICES	7 5	399 2	207 0	490 0		1096 2
6300 AIR QUALITY RESEARCH	74 0	4403 0	3693 8	1682 0	314 0	10092 8
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES						
TOTAL	81 5	4802 2	3900 8	2172 0	314 0	11189 0
GRAND TOTAL	91 5	5176 3	4149 8	2457 0	514 0	12297 1

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

METEOROLOGICAL SERVICES RESEARCH BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES						
1200 MARINE WEATHER SERVICES						
1300 AVIATION WEATHER SERVICES						
1400 ECONOMIC WEATHER SERVICES						
1500 CANADIAN FORCES WEATHER SERVICES						
2000 DATA ACQUISITION						
3000 WEATHER SERVICES SUPPORT SYSTEMS	79 0	4339 0	1945 3	1123 0	280 0	7687 3
TOTAL	79 0	4339 0	1945 3	1123 0	280 0	7687 3
4 CLIMATE SERVICES & RESEARCH						
5 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	79 0	4339 0	1945 3	1123 0	280 0	7687 3

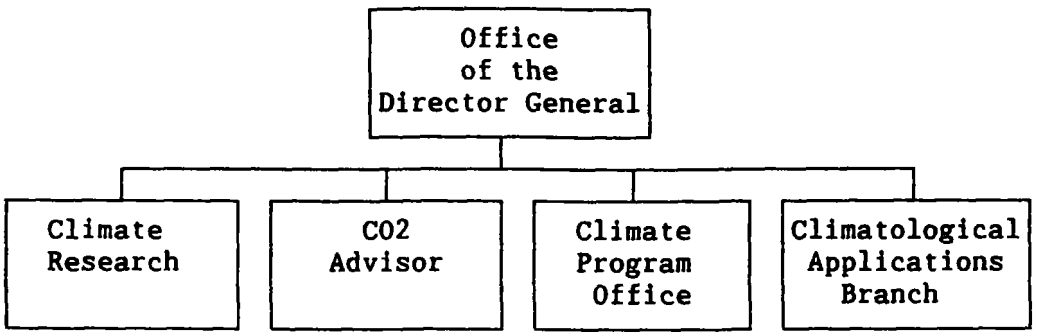
1989-90 Budget
($000)

ATMOSPHERIC RESEARCH DIRECTORATE

5 4 6 BY ORGANIZATIONAL UNIT

	PY	SALARY	O&M	CAPITAL	G&C	TOTAL
OFFICE OF THE DIRECTOR GENERAL	9 5	726 3	629 0	192 0	0 0	1547 3
AIR QUALITY & INTER-ENVIRONMENTAL RESEARCH BRANCH	91 5	5176 3	4149 8	2457 0	514 0	12297 1
METEOROLOGICAL SERVICES RESEARCH BRANCH	79 0	4339 0	1945 3	1123 0	280 0	7687 3
ARD TOTAL	180 0	10241 6	6724 1	3772 0	794 0	21531 7

5 5 CANADIAN CLIMATE CENTRE



5 5 1 FUNCTIONS THE CANADIAN CLIMATE CENTRE (127 0 PY, $9,527 2 K)

The Canadian Climate Centre was organized in 1978 to provide a focus for climate activity in Canada The Centre consists of a Climatological Applications Branch with five Divisions, a Research Component with a Chief Scientist and two Divisions, the Canadian Climate Program Office, and the CO_2 Advisor

Office of the Director General and Climate Program Office
(8 PY, $1,402 1 K)

- provides the executive scientific direction and management of the Canadian Climate Centre

The Climate Program Office acts as a focal point to
- provide secretariat support for the Climate Planning Board of Canada and other committees associated with the Canadian Climate Program,
- promote the achievement of Climate Program objectives

The CO_2 Advisor
- provides up-to-date information and advice concerning CO_2 issues to EMR, DOE and the Climate Planning Board
- Manages the impacts program (contracted out), along with publishing the Climate Change Digest

Research Component (23 PY, $1,411 1 K)

The research component of the Centre consists of two divisions working under the general direction of the Chief Scientist

1) The Numerical Modelling Division
   - undertakes research to gain improved knowledge of climate as a physical system and to simulate climate through numerical modelling

2) The Monitoring and Prediction Division
   - develops improved systems for monitoring the current climate situation across Canada for weekly publication, and
   - analyses and assesses statistical and other methods of climate prediction

Climatological Applications Branch (96 0 PY, $6,714 0 K)

This Branch consists of a Director's Office and five Divisions
1) The Data Management Division
   - collects and quality controls all surface, upper air and supplemental data entering the national climate archives,
   - manages archives to serve the needs for climate data in applications and research, and
   - assists the Climatological Services Division in the provision of services

2) The Climatological Service Division
   - assists regional offices in handling inquiries,
   - processes inquiries that are national in scope,
   - prepares climate data and information (such as maps, atlases, guides, manuals, bibliographies, data summaries and climate studies) describing the availability of climate data,
   - provides information in digital form, on microfilm and in printed copy, and
   - assembles the information in national, current, historical and statistical series publications

3) The Hydrometeorological and Marine Climatology Division
   - develops techniques for application in the science of hydrometeorology in support of the hydrological and water resource sectors, it is also responsible for the provision of advice and the development of products and methods in order to provide services to all socio-economic sectors which require information on precipitation,
   - undertakes research and development in the domains of hydrometeorological measures and climatological processes in the physics of clouds, and
   - develops techniques for application in marine climatology in support of the energy and oceanic transportation fields

4) The Hydrometeorological Research Division (Saskatoon)
   - undertakes research to produce a better understanding of physical processes within the hydrological cycle, and
   - develops techniques to analyse hydroclimate statistics and to tailor the application of Numerical Weather Prediction (NWP) products to the water resource sector with emphasis on Prairie and Arctic hydrology problems

5) The Analysis and Impact Division
   - has extensive applications expertise dealing with agriculture and forestry meteorology, arctic meteorology, energy, industrial applications, and the overall implications of climate variability and change upon Canada

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

CANADIAN CLIMATE CENTRE

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
4000 CLIMATE SERVICES & RESEARCH						
4100 CLIMATE SERVICES	73 5	3409 5	632 0	419 0		4460 5
4500 CLIMATE RESEARCH AND DEVELOPMENT	42 5	2162 7	721 0	114 0		2997 7
4600 CLIMATE SERVICES SUPPORT SYSTEMS	9 4	577 9	397 5	202 0		1177 4
4700 CANADIAN CLIMATE PROGRAM	1 8	88 6	803 0			891 6
TOTAL	127 0	6238 7	2553 5	735 0		9527 2
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	127 0	6238 7	2553 5	735 0		9527 2

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

OFFICE OF THE DIRECTOR GENERAL-CCC

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
4000 CLIMATE SERVICES & RESEARCH						
4100 CLIMATE SERVICES						
4500 CLIMATE RESEARCH AND DEVELOPMENT						
4600 CLIMATE SERVICES SUPPORT SYSTEMS	6 4	406 0	102 5	2 0		510 5
4700 CANADIAN CLIMATE PROGRAM	1 8	88 6	803 0			891 6
TOTAL	8 0	494 6	905 5	2 0		1402 1
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	8 0	494 6	905 5	2 0		1402 1

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

CLIMATE RESEARCH BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
) MANAGEMENT & COMMON SUPPORT SERVICES						
1 WEATHER SERVICES						
4 CLIMATE SERVICES & RESEARCH						
41 CLIMATE SERVICES	6 5	356 3	55 0	3 0		414 3
45 CLIMATE RESEARCH AND DEVELOPMENT	16 5	923 8	67 0	6 0		996 8
4600 CLIMATE SERVICES SUPPORT SYSTEMS						
47 CANADIAN CLIMATE PROGRAM						
TOTAL	23 0	1280 1	122 0	9 0		1411 1
5000 ICE SERVICES						
6 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	23 0	1280 1	122 0	9 0		1411 1

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

CLIMATOLOGICAL APPLICATIONS BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
4000 CLIMATE SERVICES & RESEARCH						
4100 CLIMATE SERVICES	67 0	3053 2	577 0	416 0		4046 2
4500 CLIMATE RESEARCH AND DEVELOPMENT	26 0	1238 9	654 0	108 0		2000 9
4600 CLIMATE SERVICES SUPPORT SYSTEMS	3 0	171 9	295 0	200 0		666 9
4700 CANADIAN CLIMATE PROGRAM						
TOTAL	96 0	4464 0	1526 0	724 0		6714 0
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	96 0	4464 0	1526 0	724 0		6714 0

1989-90 Budget
($000)

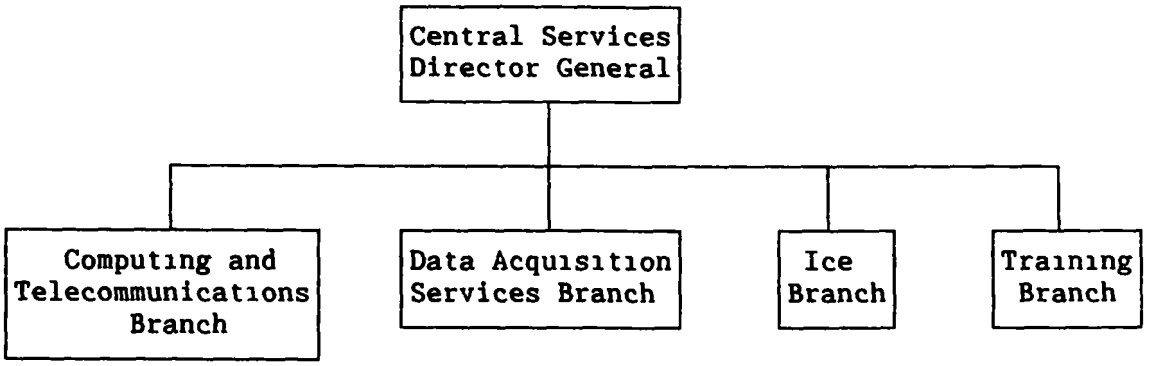
CANADIAN CLIMATE CENTRE

5 5 6

BY ORGANIZATIONAL UNIT

	PY	SALARY	O&M	CAPITAL	G&C	TOTAL
OFFICE OF THE DIRECTOR GENERAL	8 0	494 6	905 5	2 0		1402 1
RESEARCH COMPONENT	23 0	1280 1	122 0	9 0		1411 1
CLIMATOLOGICAL APPLICATIONS BRANCH	96 0	4464 0	1526 0	724 0		6714 0
CCC TOTAL	127 0	6238 7	2553 5	735 0		9527 2

5 6 CENTRAL SERVICES DIRECTORATE



5 6 1 FUNCTIONS CENTRAL SERVICES DIRECTORATE (326 0 PY, $66,677 0 K)

This Directorate is responsible for information and advisory services on sea ice distribution, computing and telecommunications services, technical and professional training, and the centralized design, implementation and sustenance of data acquisition systems The Directorate has four Branches, each of which is responsible for one of the services listed above The Director General is the Chairman of the AES Capital Co-ordinating Committee and of the AES Program Advisory Committee on Computers and Communications

Computing and Telecommunications Services Branch
(105 5 PY, $24,702 4 K)

- plans, designs and operates AES' national EDP and the telecommunications facilities, and
- ensures that AES has the EDP, information-processing, telecommunication services and facilities to meet current and future requirements

Within this Branch, there are three Divisions

1) The Centre d'Informatique de Dorval
   - co-located with the Canadian Meteorological Centre in Dorval operates the national computation facilities for all AES programs,
   - operates CRAY X-MP and 1S computer systems, along with extensive support computers and peripherals, and
   - provides centralized computing services to AES and other government departments and selected academic users

2) Operational Systems Division
   - manages, operates and maintains AES national telecommunications systems,
   - operates a National Advanced Systems AS-9 computer system to provide computing and user services primarily to support the Canadian Climate Centre and other users at AES Downsview, and
   - operates the central satellite receiving station

3) Planning & Development Division
   - develops plans, manages development projects and co-ordinates activities to ensure that AES' needs for EDP and telecommunications services are satisfied

Data Acquisition Services Branch (78 0 PY, 12,965 6 K)

- responsible for the planning, design, specification and standards, procurement, implementation and operational support of measurement systems for meteorological and related enviromental conditions in support of all AES services

There are four Divisions and one Section reporting to the Director, all located in Downsview

1) Technology Support Division
   - develops and evaluates prototype meteorological sensors and systems for AES operational networks and research programs,
   - develops specifications and standards to meet observing systems requirements, and
   - investigates new technologies applicable to the AES data acquisition systems

2) Implementation Division
   - plans and manages projects for implementation of new and replacement data acquisition systems,
   - supports new and/or replacement procurements (including for Stores inventory), and
   - tests and evaluates new meteorological instrumentation systems

3) Operational Data Acquisition Systems Division·
   - develops and promulgates national standards and documentation for installation and maintenance for the Service's Data Acquisition Services equipment,
   - arranges for the national maintenance program for data acquisition systems,
   - coordinates "life cycle" management activities for data acquisition systems,
   - provides specialized support such as emergency maintenance services, and
   - provides technical training for field personnel of AES and co-operating agencies

4) Quality Assurance Division
   - provides quality asurance services for procurement of instruments, systems and related services

5) Data Acquisition Systems Planning Section
   - Coordinates the design, development, preparation, and revision of the AES Meteorological Data Acquisition Plan,
   - plans and organizes the preparation of strategic alternatives for meeting objectives in the meteorological data acquisition plan, and
   - prepares and provides consultation on policy documents related to meteorological data acquisition systems

Ice Branch (68 5 PY, $24,256 5 K)

- responsible for the provision of sea ice information for all Canadian territorial and adjacent ocean areas,
- provides a daily and seasonal ice forecasts to shipping interests in ice waters,
- prepares ice climatology reports,
- supplies climatological ice information to users upon request,
- maintains an ice data archive, and
- conducts research into new and improved techniques for ice data collection and analysis

There are six Divisions in the Branch Three of the Divisions (Ice Forecasting, Ice Program Products Development and Ice Climatology & Applications) are located in Ottawa and are commonly referred to as Ice Centre Environment Canada (ICEC) The Director's Office, Ice Reconnaissance Division and Ice Reconnaissance Engineering Division are located in Downsview

1) Ice Forecast Division
   - provides analyses and forecasts of ice distribution, type, movement and development, and
   - provides daily and seasonal ice forecasts to various users, including the Canadian Coast Guard icebreaker fleet, the Canadian Oil and Gas Lands Administration (COGLA), marine transportation interests, fishermen, offshore resource development interests

2) Ice Climatology & Applications Division
   - develops and maintains the ice data archive,
   - supplies climatological ice information and prepares reports, and
   - provides advice on ice climatology application to varied users such as marine engineers and designers, naval architects, scientists in varied fields as geophysics, environment, fisheries

3) Ice Program Products Development Division
   - manages sub-projects to implement the Expanded Ice Information Services Project (EIISP) with main emphasis on Ice Centre Systems

4) Ice Reconnaissance Division
   - provides observations of the distribution and type of sea ice from aerial ice reconnaissance, ship reports, shore reports and satellites

5) Ice Research & Development Division

This Division functions within the Institute for Space and Terrestrial Science at York University in Downsview

   - develops models, methods and procedures for making optimum use of remote sensing in the ice programs, and
   - participates in international projects for improving research & development activities respecting sea ice with the main emphasis on remote sensing

6) Ice Engineering Division
   - provides engineering expertise for the design, specification, acquisition and implementation of ice data acquisition systems, and
   - manages related EIISP sub projects

Training Branch (70 0 PY, $4,131 6 K)

- recruits and trains professional meteorologists and meteorological technicians to meet AES human resource needs, and
- establishes and maintains contact with Canadian universities and other educational institutions to encourage the training of atmospheric scientists and the development of studies in the atmospheric sciences

There are three Divisions in the Branch

1) Professional Training and Development Division
   - conducts professional training courses at Downsview (English) and in Montreal (French) for newly recruited meteorologists to qualify them for positions in operational weather offices,
   - develops and conducts advanced and specialized training courses, including correspondence courses, in applied and operational meteorology, and
   - sponsors workshops and seminars relating to environmental issues such as environmental emergencies, air quality, acid rain, etc

2) Technical Training and Development Division
   - conducts technical training courses for technical personnel in both official languages at the Transport Canada Training Institute, Cornwall Courses presented include the following Basic, Advanced, Presentation and Aerological Technician courses, and Radar, Ice, Weatheradio and Maintenance courses, and
   - provides meteorological courses for MOT and selected DND technical personnel

3) Training Co-ordination, Evaluation and Services
   - recruits new meteorologists,
   - liaises with universities and colleges concerning meteorological training,
   - counsels student applicants,
   - processes educational enquiries and evaluates educational and training requirements,
   - provides French and English Technical Editing/Publishing services,
   - prepares graphic art, and
   - provides audio visual and computer services to Training Branch and AES clients

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

CENTRAL SERVICES DIRECTORATE

SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES							
1000 WEATHER SERVICES							
1100 PUBLIC WEATHER SERVICES							
1200 MARINE WEATHER SERVICES							
1300 AVIATION WEATHER SERVICES							
1400 ECONOMIC WEATHER SERVICES							
1500 CANADIAN FORCES WEATHER SERVICES							
2000 DATA ACQUISITION		74 0	3475 1	586 5	8700 6		12762 2
3000 WEATHER SERVICES SUPPORT SYSTEMS		145 5	7218 9	15886 8	2691 9	100 0	25897 6
	TOTAL	219 5	10694 0	16473 3	11392 5	100 0	38659 8
4000 CLIMATE SERVICES & RESEARCH							
4100 CLIMATE SERVICES		3 0	126 3	35 0			161 3
4500 CLIMATE RESEARCH AND DEVELOPMENT							
4600 CLIMATE SERVICES SUPPORT SYSTEMS		34 0	1389 6	2132 7	35 0		3557 3
4700 CANADIAN CLIMATE PROGRAM							
	TOTAL	37 0	1515 9	2167 7	35 0		3718 6
5000 ICE SERVICES							
5100 ICE RECONNAISSANCE & DATA ACQUISITION		26 0	1680 0	12690 0	273 0		14643 0
5200 ICE ANALYSIS & FORECASTING		28 7	1185 3	2194 0	574 9		3954 2
5300 ICE CLIMATE SERVICES		4 0	212 0	97 8	47 0		356 8
5400 ICE SERVICES SUPPORT SYSTEM		4 0	161 0	190 0	5 0		356 0
5500 RESEARCH AND DEVELOPMENT -ICE		4 8	276 0	445 0	1366 6		2087 6
	TOTAL	69 5	3654 3	15625 8	5018 5		24298 6
6000 AIR QUALITY SERVICES & RESEARCH							
GRAND TOTAL		326 0	15864 2	34266 8	16446 0	100 0	66677 0

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

OFFICE OF DIRECTOR GENERAL-CSD

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES						
1200 MARINE WEATHER SERVICES						
1300 AVIATION WEATHER SERVICES						
1400 ECONOMIC WEATHER SERVICES						
1500 CANADIAN FORCES WEATHER SERVICES						
2000 DATA ACQUISITION						
3000 WEATHER SERVICES SUPPORT SYSTEMS	4 0	184 3	436 6			620 9
TOTAL	4 0	184 3	436 6			620 9
4000 CLIMATE SERVICES & RESEARCH						
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	4 0	184 3	436 6			620 9

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

COMPUTING AND TELECOMMUNICATIONS SYSTEMS BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES							
1 WEATHER SERVICES							
11 PUBLIC WEATHER SERVICES							
1[illegible] MARINE WEATHER SERVICES							
1 AVIATION WEATHER SERVICES							
14 ECONOMIC WEATHER SERVICES							
15 CANADIAN FORCES WEATHER SERVICES							
2 [illegible] DATA ACQUISITION							
3000 WEATHER SERVICES SUPPORT SYSTEMS		71 5	3560 0	14989 2	2595 9		21145 1
	TOTAL	71 5	3560 0	14989 2	2595 9		21145 1
4 CLIMATE SERVICES & RESEARCH							
4100 CLIMATE SERVICES							
45 CLIMATE RESEARCH AND DEVELOPMENT							
4600 CLIMATE SERVICES SUPPORT SYSTEMS		34 0	1389 6	2132 7	35 0		3557 3
4700 CANADIAN CLIMATE PROGRAM							
	TOTAL	34 0	1389 6	2132 7	35 0		3557 3
5 ICE SERVICES							
6 [illegible] AIR QUALITY SERVICES & RESEARCH							
GRAND TOTAL		105 5	4949 6	17121 9	2630 9		24702 4

ATMOSPHERIC ENVIRONMENT SERVICE
1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)
DATA ACQUISITION SERVICES BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES						
1200 MARINE WEATHER SERVICES						
1300 AVIATION WEATHER SERVICES						
1400 ECONOMIC WEATHER SERVICES						
1500 CANADIAN FORCES WEATHER SERVICES						
2000 DATA ACQUISITION	74 0	3475 1	586 5	8700 6		12762 2
3000 WEATHER SERVICES SUPPORT SYSTEMS						
TOTAL	74 0	3475 1	586 5	8700 6		12762 2
4000 CLIMATE SERVICES & RESEARCH						
4100 CLIMATE SERVICES	3 0	126 3	35 0			161 3
4500 CLIMATE RESEARCH AND DEVELOPMENT						
4600 CLIMATE SERVICES SUPPORT SYSTEMS						
4700 CANADIAN CLIMATE PROGRAM						
TOTAL	3 0	126 3	35 0			161 3
5000 ICE SERVICES						
5100 ICE RECONNAISSANCE & DATA ACQUISITION	1 0	42 1				42 1
5200 ICE ANALYSIS & FORECASTING						
5300 ICE CLIMATE SERVICES						
5400 ICE SERVICES SUPPORT SYSTEM						
5500 RESEARCH AND DEVELOPMENT -ICE						
TOTAL	1 0	42 1				42 1
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	78 0	3643 5	621 5	8700 6		12965 6

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

ICE SERVICES BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
4000 CLIMATE SERVICES & RESEARCH						
5000 ICE SERVICES						
5100 ICE RECONNAISSANCE & DATA ACQUISITION	25 0	1637 9	12690 0	273 0		14600 9
5200 ICE ANALYSIS & FORECASTING	28 7	1185 3	2194 0	574 9		3954 2
5300 ICE CLIMATE SERVICES	4 0	212 0	97 8	47 0		356 8
5400 ICE SERVICES SUPPORT SYSTEM	4 0	161 0	190 0	5 0		356 0
5500 RESEARCH AND DEVELOPMENT -ICE	4 8	276 0	445 0	1366 6		2087 6
TOTAL	68 5	3612 2	15625 8	5018 5		24256 5
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	68 5	3612 2	15625 8	5018 5		24256 5

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

TRAINING BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES						
1000 WEATHER SERVICES						
1100 PUBLIC WEATHER SERVICES						
1200 MARINE WEATHER SERVICES						
1300 AVIATION WEATHER SERVICES						
1400 ECONOMIC WEATHER SERVICES						
1500 CANADIAN FORCES WEATHER SERVICES						
2000 DATA ACQUISITION						
3000 WEATHER SERVICES SUPPORT SYSTEMS	70 0	3474 6	461 0	96 0	100 0	4131 6
TOTAL	70 0	3474 6	461 0	96 0	100 0	4131 6
4000 CLIMATE SERVICES & RESEARCH						
5000 ICE SERVICES						
6000 AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	70 0	3474 6	461 0	96 0	100 0	4131 6

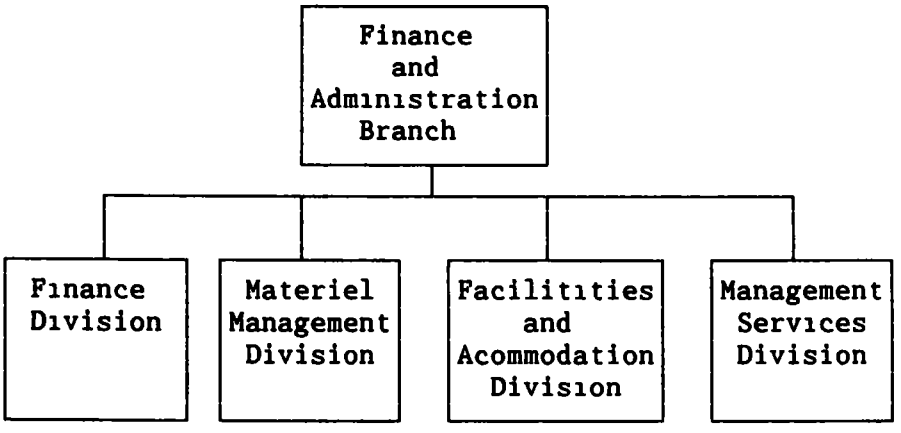
1989-90 Budget
($000)

5 6 8 CENTRAL SERVICES DIRECTORATE

BY ORGANIZATIONAL UNIT

	PY	SALARY	O&M	CAPITAL	G&C	TOTAL
OFFICE OF DIRECTOR GENERAL	4 0	184 3	436 6	0		620 9
COMPUTING AND TELECOMMUNICATIONS SERVICES BRANCH	105 5	4949 6	17121 9	2630 9		24702 4
DATA ACQUISITION SERVICES BRANCH	78 0	3643 5	621.5	8700 6		12965 6
ICE BRANCH	68 5	3612 2	15625 8	5018 5		24256 5
TRAINING BRANCH	70 0	3474 6	461 0	96 0	100 0	4131 6
CSD TOTAL	326 0	15864 2	34266 8	16446 0	100 0	66677 0

5 7 FINANCE AND ADMINISTRATION BRANCH



5 7 1 FUNCTIONS FINANCE AND ADMINISTRATION BRANCH (99 0 PY, $12,764 9 K)

This Branch provides functional direction, advice and services to AES headquarters elements, Regions, and those organizations whose central elements interface with AES headquarters The Branch provides the focal point for the implementation of concepts inherent in Comptrollership There are four Divisions

1) Finance Division
   - develops AES financial policies procedures and systems,
   - develops and modifies AES Work Planning policy, procedures and processes,
   - ensures, with the Policy, Planning and Assessment Directorate, that both Financial and Planning systems incorporate adequate linkage between resource plans and program objectives, goals and outputs,
   - provides guidance and advice on financial matters to senior management,
   - co-ordinates and reports on the preparation of Treasury Board submissions,
   - processes and pays all invoices and provides accounting services to AES/headquarters,
   - prepares and submits Treasury Board Multi-Year Operational Plan and Main Estimates financial data and provides a functional lead for MYOP-Update and Estimates,
   - prepares work plan allocations and budget data and recommends changes to ADM,
   - analyses and outlines the financial status of AES and recommends, to ADMA and AMC, corrective actions required, and
   - ensures accounting and financial informations systems function effectively

2) Materiel Management Division
   - develops related Service policies, procedures and systems,
   - provides procedural recommendations and advice on supply matters,
   - provides a functional lead for the Materiel-In-Use system, Stores Inventory Management system, and Fleet Management,
   - provides policy advice and guidance as well as services to AES on contracts,
   - requisitions, stores and distributes special meteorological instruments, equipment and supplies, and
   - co-ordinates the annual Eastern Arctic Resupply for Environment Canada

3) Facilities and Accomodation Division
   - develops AES policies and procedures and provides support services in accommodations, real property, security, parking, accessibility and telecommunication matters,
   - provides functional guidance to regional offices on all facilities-related matters,
   - serves as Program Area Co-ordinator for Facilities, Non-Meteorological Furniture and Equipment, and Vehicles,
   - co-ordinates Major Construction projects at the service level, and
   - provides lead role for security for the service in the area of information, personnel, EDP and physical security

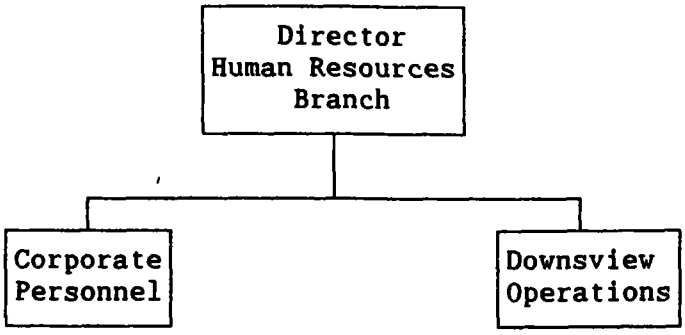
4) Management Services Division
   - Provides policy, procedural and system recommendations and advice on general administration matters;
   - Develops policies, and provides procedural recommendations and advice on information retrieval systems and library matters,
   - Acquires and makes available for reference and loan a collection of books, journals and other resource material,
   - provides support services to AES in records management, mail, publications, cartography, health and safety, distribution,
   - Co-ordinates the planning, implementation (as appropriate) and monitoring activities for the AES Handicapped Program, and the Incentive Awards Program, and
   - Administers the Access to Information and Privacy Program

   In addition, the Branch (through the AES Management Information Co-ordinating Committee) co-ordinates the identification of management information requirements and the development of Management Information Systems, and the linkages between them

ATMOSPHERIC ENVIRONMENT SERVICE
1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)
FINANCE AND ADMINISTRATION BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY		PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
0800 MANAGEMENT & COMMON SUPPORT SERVICES							
0810 MANAGEMENT		6 0	327 5	384 0	1405 0		2116 5
0830 COMMON SUPPORT SERVICES		62 0	2239 3	844 7	190 0		3274 0
	TOTAL	68 0	2566 8	1228 7	1595 0		5390 5
1000 WEATHER SERVICES							
1100 PUBLIC WEATHER SERVICES							
1200 MARINE WEATHER SERVICES							
1300 AVIATION WEATHER SERVICES							
1400 ECONOMIC WEATHER SERVICES							
1500 CANADIAN FORCES WEATHER SERVICES							
2000 DATA ACQUISITION							
3000 WEATHER SERVICES SUPPORT SYSTEMS		31 0	1398 7	1970 7	2365 0	1195 0	6929 4
	TOTAL	31 0	1398 7	1970 7	2365 0	1195 0	6929 4
4000 CLIMATE SERVICES & RESEARCH							
4100 CLIMATE SERVICES							
4500 CLIMATE RESEARCH AND DEVELOPMENT							
4600 CLIMATE SERVICES SUPPORT SYSTEMS				100 0			100 0
4700 CANADIAN CLIMATE PROGRAM							
	TOTAL			100 0			100 0
5000 ICE SERVICES							
5100 ICE RECONNAISSANCE & DATA ACQUISITION							
5200 ICE ANALYSIS & FORECASTING							
5300 ICE CLIMATE SERVICES							
5400 ICE SERVICES SUPPORT SYSTEM				120 0			120 0
5500 RESEARCH AND DEVELOPMENT -ICE							
	TOTAL			120 0			120 0
6000 AIR QUALITY SERVICES & RESEARCH							
6100 AIR QUALITY SERVICES				225 0			225 0
6300 AIR QUALITY RESEARCH							
6700 AIR QUALITY & RESEARCH SUPPORT SERVICES							
	TOTAL			225 0			225 0
GRAND TOTAL		99 0	3965 5	3644 4	3960 0	1195 0	12764 9

5 8 HUMAN RESOURCES BRANCH



5 8 1 Human Resources Branch (36 0 PY, $2,075 4 K)

This Branch provides Human Resources services to the AES Headquarters components, Regions and the Canadian Forces Weather Service (CFWS), and participates in the Personnel Management planning activity of AES It consists of two components, Corporate Personnel and Downsview Operations Corporate Personnel consists of five divisions which are responsible for providing support to management on the implementation of the AES strategic plan, co-ordinating national programs and activities, and providing specialist advice to the operational components Downsview Operations provides service to AES Headquarters units and the CFWS The Regional Personnel Offices report directly to the Regional Director, functional direction is provided by the Branch

Corporate Personnel

1) Human Resources Planning Division
   - provides advice and guidance in application of policies concerning staffing, recruitment, human resources planning, and training and development,
   - co-ordinates and administers all senior management/executive staffing, redeployment and development,
   - provides advice and guidance on workforce adjustment and attendant issues and priorities,
   - co-ordinates the management of the meteorologist population, including recruitment of meteorologists on a national basis,
   - establishes Service recruitment policies for meteorological technicians and meteorologists,
   - plans, implements and evaluates service management training and development programs,
   - develops action plans to attain the objectives of the Employment Equity Plan, and
   - monitors and reports on the progress of the Service towards meeting the objectives of the Employment Equity Plan,

2) Staff Relations and Compensation Division
   - co-ordinates Service input to collective bargaining and serves as a member of the MT and EG negotiating teams,
   - investigates and co-ordinates replies to final level grievances and referrals to adjudication,
   - provides advice and guidance and ensures conformity in interpretations of collective agreements,
   - acts as the AES focal point on conflict of interest questions,
   - participates in and provides advice at Service-level UMCCs, Safety and Health Committee meetings and co-ordinates personnel-related issues,
   - provides guidance in the application of policies and on the administration of discipline,
   - administers the designation and exclusion process,
   - when appropriate, co-ordinates the service strike contingency planning activities, provides advice to RPMs and senior managers, and acts as two-way communication link between TB, DOE and Service, and
   - develops performance standards and indicators and monitors their effectiveness

3) Classification Division
   - co-ordinates activities related to AES classification policy, guidelines and systems development,
   - co-ordinates activities related to classification of positions including advice and guidance, monitoring of the quality of decisions, control of standards application and relativity,
   - reviews the validity of classification standards, with particular emphasis on the prime user standards, such as MT and EG, and manages the implementation of conversions,
   - co-ordinates the audit program, grievance administration and classification training, and
   - ensures the consistent application of the delegation of classification authority

4) Official Languages Division
   - administers the Official Languages Program by providing advice and guidance to line managers,
   - develops action plans to attain the objectives of the Official Languages Program,
   - monitors and reports on the progress of the Service towards meeting the objectives of the Official Languages Plan,
   - investigates complaints,
   - supervises revision and editing services,
   - co-ordinates translation services,
   - co-ordinates and administers language tests and schedules language training, and
   - administers the monitor program

5) Human Resource Management Information System
   - manages the implementation of a computerized human resources information system,
   - supports the design and development of new system modules,
   - develops and implements human resource reports, and
   - provides user training

Downsview Operations

- provides day-to-day personnel services, including classification, staffing, staff relations and pay and benefits, to employees at AES Headquarters and to the Canadian Forces Weather Service,
- ensures the integrity of pay administration in AES, and
- manages the Employee Assistance Program for AES

ATMOSPHERIC ENVIRONMENT SERVICE

1989-90 BUDGET BY SUB-ACTIVITY (SA-1) AND SUB-SUB ACTIVITY (SA-2)

HUMAN RESOURCES BRANCH

SUB-ACTIVITY / SUB-SUB-ACTIVITY	PY	($000) SALARY	O&M	CAPITAL	G&C	TOTAL
) MANAGEMENT & COMMON SUPPORT SERVICES						
10 MANAGEMENT						
0830 COMMON SUPPORT SERVICES	36 0	1725 0	346 4	4 0		2075 4
TOTAL	36 0	1725 0	346 4	4 0		2075 4
] WEATHER SERVICES						
4 CLIMATE SERVICES & RESEARCH						
5 ICE SERVICES						
6) AIR QUALITY SERVICES & RESEARCH						
GRAND TOTAL	36 0	1725 0	346 4	4 0		2075 4