Environment Canada
25th Anniversary
SCRAPBOOK

Hatching Snow Goose on Ellesmere Island, 1971.
(Photo by Richard Kerbes, C.W.S., Saskatoon)

Personal recollections of
Environment Canada employees
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Layout and design by
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Printed by Canada Communication Group

EcoLogo™ Paper / Papier Éco-Logo™

Également disponible en français sous le titre:
Album-souvenir du 25e anniversaire
d'Environnement Canada

Congratulations, Environment Canada!

Every member of this department can take pride in its environmental achievements over the past 25 years.

You have built public support for the environment, and partnerships with governments, private organizations, communities and individuals. Together, you have taken action to rid water and air of toxics, and to protect wildlife and habitat. You provide weather services that help safeguard Canadians' lives and property. Canada supports a fast-growing environmental industry sector and is a leader in global issues such as acid rain, ozone-layer protection and biodiversity.

In the years ahead, we will meet new environmental challenges. As Minister, I know that the women and men of this department will continue to serve our country with skill and dedication, as they have for the past 25 years.

Our achievements as Canadians working together are the foundation for a healthy environment in the future.

Sergio Marchi

Hon. Sergio Marchi
Minister of the Environment

Environment Canada
1971–1996: 25 Years of Environmental Achievement

This year marks the 25th anniversary of our department. Environment Canada was established June 11, 1971.

In 1996, we are also celebrating the 125th anniversary of Canada's Weather Service, our window on the weather since 1871.

The stories in this Anniversary Scrapbook describe some of the achievements and experiences of the men and women who work for Environment Canada.

All of us in this department have a leadership role to play in serving Canadians and sharing our knowledge and experience with others who are concerned for the environment. We have achieved much in these first 25 years. There is still much to be done. Let's look ahead to many more years of achievement.

Mel Cappe
Deputy Minister

At the Beginning...

The Honorable Jack Davis

The late Jack Davis, the first Minister of the Environment, said that Pierre Elliott Trudeau, who became Prime Minister in 1968, was behind the establishment of the Department of the Environment. Davis said, "Mr. Trudeau had a keen interest in the environment and had worked as an adviser on the Gulf of St. Lawrence to Prime Minister St. Laurent in the 1950s." He added, "I was pushing for it because we wanted to get more clout in extending our limits offshore."

The proposal to establish "a department to be concerned with the environment ... with a mandate for the protection of the biosphere," was announced at the opening of a new session of Parliament, October 8, 1970.

The Speech from the Throne described the Trudeau vision of a "Just Society" and warned that, "All our efforts for a stable prosperity and for a humane community will be of little value to us ... if we do not quickly ... grapple with the threat ... represented by environmental pollution."

Environment Canada was formed by bringing together the Department of Fisheries and Forestry and elements of other departments, including the weather service from Transport; the air pollution control division from Health and Welfare; the water sector from Energy, Mines and Resources; and the Canadian Wildlife Service from Indian and Northern Affairs.

The department began operation with five services: Atmospheric Environment Service; Environmental Protection Service; Fisheries Service; Land, Forest and Wildlife Service; and Water Management Service.

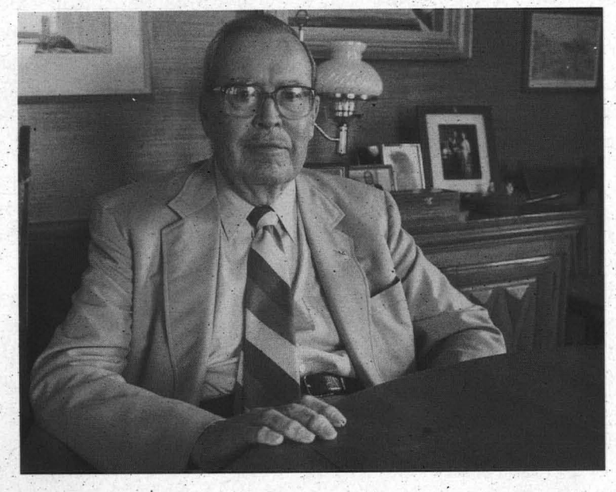
The First Deputy Minister

Robert Shaw, first Deputy Minister of Environment Canada, is a man who likes to get things done. Born in Montreal February 16, 1910, he graduated in engineering from McGill University in 1933, in the midst of the Great Depression. His first job was as a labourer with the Foundation Company of Canada in Montreal, one of the largest construction companies in the country. He became President of the Company in 1962.

In 1963, Mr. Shaw was asked by Prime Minister Pearson to take charge of construction and administration of Expo '67, the world exposition in Montreal to mark Canada's centennial. For his success in that role, he was made a Companion of the Order of Canada in 1967.

Robert Shaw recalled that Environment Canada grew out of the Department of Fisheries and Forestry and was based on the Fisheries Act. "Anything that was good for a fish was to be encouraged by the Government of Canada and anything that was bad for a fish was to be discouraged. That covers the health of the whole environment — forests, air and water."

Dorothy Neale, who was the first Deputy Minister's secretary, says Robert Shaw was "always bright-eyed and enthusiastic." Returning to Montreal in mid-April after spending most of the winter in Hawaii, Mr. Shaw speaks with strong assurance as he says, "My foot-step is a little shorter and a bit slower but I am in good health and looking forward to seeing former associates at Environment Canada."



Robert Shaw

Acid Rain: The Issue That Wouldn't Go Away!

"It took 13 years to pose that picture." Alex Manson points to a photo of President Bush and Prime Minister Mulroney signing the Canada-U.S. Air Quality Accord in March 1991.

Manson started working on the acid rain file with EPS and carried it through CPG and AES. He says, "We learned a lot over those 13 years and I'm not sure those lessons have been passed on to other people; like the concerted effort that is needed to deal with the United States, and how much effort was put into public awareness.

"This issue wouldn't go away because it was important to the public. It was a very clear lesson. If the public doesn't relate to your problem, you're not going to get the support needed for a solution."

In the Fall of 1979, the Great Lakes Water Quality Board issued a report. Bob Slater, Environment Canada's Regional Director in Ontario, and George Alexander of the U.S. EPA in Chicago were co-chairs. A big section of their report dealt with acid rain and that became a front-page story in the *Globe and Mail*.

"John Fraser, then Minister of the Environment, said 'We've got to do something about that.' It was his idea to form the acid rain coalition. There were fish and game associations, cottage owners and private industry, all working for a single purpose."

Manson says, "The first public reference to the acid rain issue I can remember was in a June 1977 speech by Romeo LeBlanc, who said acid rain was a ticking time bomb."

Francois Pagé, who was Director General of Communications, says Larry Gordon designed the symbol that became a lapel button, a red stop sign with the white letters STOP ACID RAIN. Pagé recalls that Louis Lemkow, who was chief of audio-visual, produced a film called *Requiem or Recovery* and organized a tour to Washington, New York and Boston.

"The American Justice Department decided to classify the film as propaganda," says Manson, "which meant that anybody who saw the film or wanted to see it had to register with the State Department. This was the best publicity we could get. For a long time, we couldn't keep up with demand for the film."

A 1981 Parliamentary Committee report, *Still Waters,* concluded that "Canada is facing the greatest environmental threat in the 114 years of our existence as a nation." Helping to prepare the committee report was Sergio Marchi, special assistant to the chairman, Ron Irwin.

Environment Minister Charles Caccia decided the Americans weren't likely to do anything soon. Caccia got the provinces to agree in principle to reduce emissions in Canada, and in March 1984, nine other countries joined Canada in agreeing to

reduce SO_2 emissions by at least 30 per cent. In February 1985 Environment Minister Suzanne Blais-Grenier announced that Canada would reduce emissions by 50 per cent within 10 years, through agreements with the provinces.

"After that announcement," Manson says, "as we signed agreements with the provinces, the Americans could no longer ask, 'When is Canada going to do something?'." In the 1988 American election campaign, George Bush said if he were elected President his administration would deal with acid rain.

Two years later, President Bush agreed to a Canada-U.S. air quality agreement. It was signed in Ottawa, March 13, 1991, two days after Alex Manson's birthday.

"Did that solve the problem?" Alex Manson pauses before answering. "Acid rain didn't happen overnight. It took years to create the problem and it may take 20 years or more to clear up the acidification of lakes. But we put a stop to the causes of acid rain. Now we have to make sure that all our partners do what they said they would do."

U.S. President George Bush (left) and Prime Minister Brian Mulroney sign the Canada-U.S. Air Quality Agreement, March 1991.

Agatha Bystram

Library Tradition Started with Agatha Bystram

Monica Czanyo's desk is in a bright, open corner of the Departmental Library on the second floor of Place Vincent Massey in Hull. The Library is never empty. "We are called Cyber-librarians now; but we are still working in support of the programs. We're here to help relieve the pressures on people who depend on information and knowledge."

Mrs. Czanyo has worked for Environment Canada since October 1971, and has been the Departmental Librarian since the death of Agatha Bystram in 1994. She grew up in Barbados as Monica Kellman and went away to the University of Edinburgh in Scotland. "I decided that I wanted to be a librarian. Some of my friends said in horror, 'You're going to sit at a desk all day and stamp books.' But I knew even then it was much more than that.

"Canada was the country with the best opportunities and I thought if I went to school there, it would be easier to find a job." She enrolled at McGill University and graduated with a degree in Library Sciences.

Monica Czanyo remembers when Agatha Bystram joined the department in 1973. "'Service to clients' was her motto," says Mrs. Czanyo. "She insisted that our users have to feel that we will do anything to get what they need. Mrs. Bystram believed that the departmental library had to be professionally staffed and properly funded."

The Library was centralized at Place Vincent Massey in the summer of 1973 from about a dozen different locations in the National Capital Region. The first year was spent sorting things out and putting everything together. The second year, Mrs. Bystram organized a meeting of all the different information and library units in the department, from all across the country, to set up a library network.

Environment Canada was the first federal government department to make an inventory of all its holdings and put them in a database that could be consulted anywhere in the department. That was the Enviro-Source and it's still being used today.

Agatha Bystram embraced technology, although she never worshipped it. "We had our first automated library catalogue in 1975," says Mrs. Czanyo. Later we got our own equipment from Data General. Then there was DOTS, the Departmental Office Technology System, which gave employees access from their own desk. Now we are moving to Windows." Mrs. Czanyo wants a library icon on every screen.

The Hagersville Tire Fire

February 12, 1990, fire broke out at a used-tire storage dump near Hagersville, Ontario, about 35 kilometres from Hamilton. An estimated 14 million tires covering five acres blazed, pouring out thick black smoke for nearly three weeks.

There were two real dangers in the Hagersville tire fire - smoke and the run-off from the fire. Tires are made of carbon-based compounds, so there could be cancerous polyaromatic hydrocarbons (PAHs) in the smoke. There was also the possibility that toxic contaminants from the burning tires might be carried into the ground by water poured on the fire.

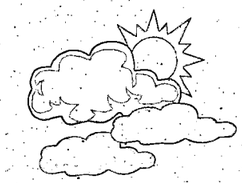
The person in charge of Environment Canada's team at Hagersville was Jean-Patrice Auclair. When the Hagersville fire broke out, Auclair was just leaving to represent Ontario Region at a national emergencies response program meeting north of Ottawa. The first reports indicated it wasn't a very big fire, so Jean-Patrice's boss told him to go ahead to the meeting. "By the time I got back, it was the biggest tire fire in history."

Environment Canada staff had been on site, providing advice since the third day of the fire. There were more than a hundred regional and provincial employees at the site during the 17 days the fire burned. Environment Canada had nearly 30 people on site at different times.

The Atmospheric Environment Service provided information to the on-site crews concerning wind direction and speed, and the likely path of the smoke. They also provided site-specific weather reports and forecasts every three hours. Other departmental employees sampled and analyzed water. smoke and toxic fumes from the fire. Inspectors from Agriculture Canada assessed possible contamination at food processing plants in the area, and Health and Welfare Canada tested drinking water in nearby communities.

Jean-Patrice Auclair remembers the effort of the firefighters. "The greatest danger was to the people who were fighting the fire. It was a very intense fire with a lot of high winds. They had teams working 16-hour shifts trying to move tires and put out the blaze. The firefighters wore protective clothing and breathing equipment and they had to pass through a decontamination unit after their shift."

After 17 days, the fire was finally extinguished. "The big lesson of Hagersville was how to deal effectively with tire fires," says Luke Trip, Manager of the National Environmental Emergencies Centre. A similar fire at St-Amable, Quebec, was extinguished much more quickly, in part because the response team decided not to use water but to bury the fire in sand. "People learn from all of these incidents," Trip says, "and that's a positive result."



Talking about the weather — it's Dave Phillips' job!

Everybody talks about the weather, but nobody talks about it more than David Phillips, a climatologist with the Atmospheric Environment Program in Toronto. Phillips is a well-known lecturer and media personality whose interest in the weather may have been imprinted at the age of one and a half when his mother held him up at the window and pointed to the worst tornado ever to hit Windsor, Ontario.

Phillips is best known as the originator of the very popular Canadian Weather Trivia Calendar, which has sold more than a quarter of a million copies since 1985. Dave was not quite 23 years old when he joined the meteorological service of the Department of Transport in 1967 after graduating from the University of Windsor with a degree in Geography. The service encouraged him to continue his studies at the University of Toronto.

Dave earned a Master's degree in climatology. His thesis was about the influence of the Great Lakes on our weather. Phillips is quick to point out that he is not a forecaster. A climatologist records and analyzes past weather conditions to help determine trends; or climate change, and to provide statistics for others such as growers, builders or sailors to design or plan their activities.

"Records are the basis of our knowledge of climate," says Phillips. A lot of Canada's weather records are the legacy of thousands of volunteer weather observers who have faithfully recorded temperature and precipitation every day.

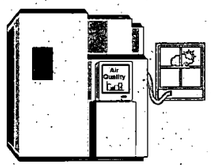
It was his admiration for the volunteer observers that led to the first weather trivia calendar in 1985. Phillips had been accumulating notes about unusual weather activity for years. "One day the idea came to me to make a calendar that we could send as a 'Thank You' to our volunteer weather observers."

A graphic designer prepared layouts that combined photos of snow storms, floods and other extreme weather conditions with a daily note. For example, "April 22, 1932, lightning struck a flock of wild geese, killing 52 birds. Free goose dinner for residents of Elgin, Manitoba."

Howard Ferguson, Director of the Canadian Climate Centre liked the idea and said 'go ahead.' "We sent 7,000 to the volunteer observers and the rest were given to employees and the media."

By 1987, demand for the calendars prompted the Queen's Printer to offer them for sale through bookstores. Dave remembers, "That year they reprinted three times and sold 35,000 copies."

One of Dave's favourite weather stories came from a diplomat with the Australian High Commission who arrived in Ottawa in January 1993. To celebrate his first major posting, he bought four cases of beer and put them in the garage, where they promptly froze. "It seems," he said, "that Canada is the only country in the world where you have to put your beer in the fridge to keep it warm."



There's Something in the Air

Don Williams became one of the federal government's first air pollution control engineers in 1969 with Health and Welfare. He moved to a similar position with Environment Canada in 1971. Tom Dann joined the group in 1972 and Paul Brunet in 1973. The three have worked as a team for almost 25 years, helping to build a national network for monitoring and improving the quality of air Canadians breathe.

Thousands of people walk past 1657 Barrington Street in Halifax every day. Few of them ever see a small tube sticking out from the second floor, about 15 feet above the busy street. That tube draws air samples into the instruments in a station that is part of the National Air Pollution Surveillance (NAPS) network, covering 60 cities from coast to coast. Some 400 monitors sample the air we breathe.

Each station consists of instruments that measure concentrations of sulphur dioxide, nitrogen oxide, carbon monoxide, ground-level ozone (or smog), lead and suspended particulate in the air.

NAPS was established in 1969 as a joint program of the federal, provincial and local governments to monitor and assess the air quality in Canada's urban centres.

Paul Brunet is Head of the Ambient section which provides instrumentation and technical support to the network agencies. The section also publishes annual data reports and provides data to the scientific community and the public. "The instruments today use microprocessor technology," he says. "They are very reliable and accurate."

Tom Dann, Head of the Air Toxics section, led a program that developed techniques for measuring some of the pollutants, like benzene, that it was previously too difficult or too expensive to measure. "There's a lot of interest in air toxics," says Tom. "Some can have a great impact on human health."

Tom Furmanczyk of the Pollution Data Analysis Division goes further. He says, "Monitoring programs provide emission inventories that quantify the amounts of different pollutants from different sources. Those inventories played a key role in negotiating agreements to reduce emissions that cause acid rain."

In negotiations with the Americans, the inventories made it possible to compare SO_2 emissions produced in Canada with emissions from the U.S.

Air pollution has long been recognized for its potential to harm the environment and human health. It comes from many sources, including motor vehicles, industrial activities and the burning of fossil fuels that heat our homes and schools. Since the passage of the Clean Air Act in 1969, the federal government, the provinces and municipalities have worked to improve air quality across Canada.

From slide rule to the Internet: 25 years of Data processing in DOE

Do you remember slide rules? or adding machines? They were state-of-the-art calculating tools when the Department of the Environment opened for business June 11, 1971. Of all the changes that have taken place in the 25 years since Environment Canada began, Simon Whitlow, Manager of Informatics and Systems Division in Vancouver, argues that the improvements in electronic data processing have been the most significant.

"The slide rule was accurate to three decimal places," Whitlow recalls. "Adding machines had a clockwork-type mechanism of cogs and levers. You could listen to what sounded like a waltz tempo as the machine hummed and clanked through the calculations. A portable calculator in those days was any machine that could be lifted and carried by one person."

The marvel that arrived in the early 1970s was the first electronic calculator, the HP35 (so called because it had 35 keys). All of a sudden people could do trigonometric and logarithmic functions with just a touch of the button. Although expensive at the time and much bulkier than current models, this first pocket calculator was truly a breakthrough in mathematical calculations.

In the late 1960s, computing meant main-frame batch processing on a large IBM computing system, using 80 column key-punched cards. A user delivered the cards to the computer room and came back later to pick up the printed output.

In those days, people were somewhat in awe of computers. One person who thought the computer could talk to her and provide advice was the victim of a practical joke. She sat at a terminal where she could type in questions and read the answers supplied by the "all-knowing computer." Unknown to her, two of her friends sat at a terminal in another room reading her input and typing the answers.

Paper tape and teletypes with an initial speed of 10 characters per second were the way of transmitting messages and information before the age of computers and fax machines.

The Osborne I was probably the first "portable" computer. Perhaps "luggable" would be a better description since it weighed 20 pounds and had to run on electricity. The tiny monochrome screen on the Osborne was about five inches diagonal and the keyboard cleverly clipped onto the front of the computer to protect it when travelling.

Simon Whitlow says, "The extension of Internet applications to PC platforms with the Mosaic and Netscape web browsers has opened the way to truly global communication." He says it will help our efforts to protect the environment, and make our work available to all Canadians.

Water, Water Everywhere...

"Water is a national resource. It's precious; it's important; and we have lots of it. Unfortunately, it's poorly distributed." Tony Clarke, ADM of the Environmental Protection Service (EPS), doesn't mince words as he talks about our most abundant resource and how Canadians have misused it.

Clarke says it has been a long, continuing struggle to change people's attitudes about the value of water, and he says nobody knows that better than Don Tate and Frank Quinn who came from the Water Sector of Energy, Mines and Resources when Environment Canada was formed in June 1971.

Tate is a geographer and economist. "The economic unit was trying to add serious economic analysis to water resource studies," he says. Don identifies one turning point in the mid-1980s when the department made a survey of water pricing practices in Canada. "OECD, the Organization for Economic Cooperation and Development had asked for a report on water pricing, but nobody really knew what the situation in Canada was.

"We surveyed about 500 communities to find out how much they charged for water. Some places charged a flat rate. Some didn't charge anything. Once we had the numbers, they showed that water prices were very cheap." The survey also showed that lower the price, the higher the volume of water that was consumed.

About the same time, the Federation of Canadian Municipalities identified a shortfall in funding for municipal infrastructure, of which about 60 per cent was the cost of water service. The municipalities asked the federal government to subsidize their infrastructure.

What they got instead was a water rate manual produced with the participation of the municipalities that established guidelines for realistic water pricing. "You could say our surveys contributed to saving the federal government hundreds of millions of dollars in possible infrastructure costs," says Don Tate.

Frank Quinn, another water specialist, recalls that the Federal Water Policy of 1987 placed a moratorium on large-scale water exports. He says, "There are communities along the border who share a common water supply. Point Roberts, Washington, for example, gets its water from Vancouver, but the idea that Canada has lots of surplus water is a myth.

"Water isn't just for drinking by people," Quinn says, "it's used in industrial processes and for crop irrigation and nourishes trees, plants and animals. Canada uses all the water we have."

CWS Gives Nature a Hand: Restoring the Peregrine Falcon

In the 1950s, wildlife enthusiasts in North America noted drastic reductions in the numbers of peregrine falcons. Research found that eating prey that contained residues of the pesticide DDT caused an accumulation of the chemical in the peregrine falcons. One effect was thinner eggshells, that were easily crushed by adult falcons during incubation. Fewer eggs hatching meant fewer falcons.

By 1970, the anatum subspecies of the peregrine falcon, which lived south of the tree line, had almost disappeared in Canada. Surveys by the Canadian Wildlife Service (CWS) found a pair on the coast of Labrador and a few others in northern Alberta. There were no peregrines in central Canada, which was their traditional range.

Tony Keith, retired Director of the National Wildlife Research Centre in Hull, says, "It wasn't natural causes, it was a chemical-DDT. None of the people using DDT to control mosquitoes and other pests intended that they would kill peregrine falcons. But that was the result. It was a warning to watch out how we use chemicals."

CWS documented the effects on wildlife, and the federal pesticide committee chaired by Agriculture Canada stopped the widespread use of DDT in Canada. "That was important," says Keith, "but Canadian birds that falcons eat still contained residues of DDT. And we couldn't control the use of DDT in central and south America where the birds go in winter. We had to do more."

In the United States, Tom Cade, a scientist at Cornell University, was experimenting with breeding falcons in captivity and his reports were encouraging. "It was an agonizing decision," says Keith, "to take nestlings from the few surviving falcons to start a breeding project. In five years' time, CWS could release young birds that might then accumulate too much DDT from their prey to breed successfully. It might be all in vain; but the decision was taken to go ahead." It was a race to prevent extinction.

"Richard Fyfe was in charge of the project in Edmonton and he deserves all the credit," says Keith. "He built a large set of flight cages of chicken wire and lumber, on the military base at Wainwright, Alberta, and he put incubators in trailers so that we could breed our own falcons and DDT-free quail to feed them."

In the spring of 1970, CWS staff went to 11 remaining aeries and took 12 nestlings back to Wainwright. Restricted access to the military base meant the birds would not be disturbed. By 1975 CWS was ready to release peregrine falcons in northern Alberta.

From 1976 to 1987, nearly half of the captive raised falcons were released in 10 cities. Tony Keith explains why: "The great horned owl will eat young peregrines; but there aren't many great horned owls in the cities." The falcon's natural habitat is on ledges in ancient nesting cliffs in the countryside, but a tall building in a city may be a reasonable substitute.

Between 1976 and 1995, a total of 1500 young falcons were released in about 30 different areas in Canada. Geoff Holroyd, of CWS in Edmonton, chairman of the peregrine falcon recovery team, reports that in 1980, a Quebec pair, both captive raised and released falcons, produced the first two young. In 1995, there were about 70 pairs in southern Canada and more than 400 pairs in the Mackenzie Valley and Yukon.

There are about 1000 pairs in the United States, compared to 39 pairs in 1975. The recovery has been successful enough for the recovery team to recommend closing the captive breeding facility at Wainwright.

The restoration of the peregrine falcon was an example of persistence - and of innovation by wildlife biologists. "It was very satisfying," says Tony Keith, "because scientists were able to find out what the problem was, and do something about it. It was a cliff-hanger, but it has paid off."

Geoff Holroyd agrees that recovery of the peregrine falcon demonstrates that we can save endangered species; but he states, "The recovery program cost more than $10 million, took more than 25 years and required luck and ingenuity by pioneers such as Richard Fyfe. Society cannot expect every endangered species to receive the same attention. We need to reduce our impact on the environment. It's the only one we have."

Official opening of the Headquarters building at Last Mountain Lake, Sask., site of the first federal wildlife reserve in North America. Left to right: Allan Kerpan, M.P., John Holliday-Scott, Gerald McKeating and John Dunlop.

The Great Downsview Snow Storm of 1975

Can you imagine 200 employees of the weather service being trapped overnight in their office building because of a snow storm? Aren't these people supposed to know what's coming?

It happened in April 1975 and those who lived through it can smile now but it was very uncomfortable at the time. One of those survivors was Henry Hengeveld, who joined the Meteorological Branch of Transport Canada (now AES) in June 1968 after graduating from the University of Toronto with an Honours B.Sc. in Physics.

Hengeveld says, "As I recall, employees in the building were finally given permission about 3:00 p.m. to leave early because of the weather. I got caught up in a queue of cars leaving the parking lot by the south exit, which was blocked by two cars stuck at the entrance to Dufferin Street. The north exit was also blocked.

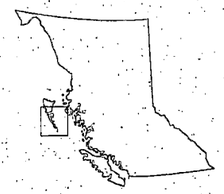
"Word passed around that Dufferin Street was now completely plugged. The weather was too cold and windy to risk walking without proper Arctic gear, so I passed the rest of the day in the building with about 300 other unfortunates (many from cars and buses stuck on Dufferin Street). At supper time, the building nurse, with the help of others, opened the cafeteria kitchen to prepare whatever food was to be found and feed the multitudes.

"Many people played card games, others just chatted. In late evening, a few began to make sleeping nests. The atmosphere was one of adventure — everyone was quite cheerful. One of the AES directors, a very conservative, straight-laced person, shared an office as sleeping quarters for the night with his secretary, each in separate corners. Later that week, he presented her with a rose in memory of their night together.

"About midnight, I noticed a snowplough go past. I decided there must be a way out, and tried once more. It took an hour to exit the parking lot and find the path left by the plough, then two more hours to reach Yonge and Sheppard, where I lived (normally a 15-minute drive). I got home about 3:00 a.m.

"Dr. Warren Godson, Director General of research, fell and broke his arm in the parking lot during the storm. He had to walk all the way to Finch Avenue, where an ambulance was waiting.

"Frank Benum, acting Assistant Deputy Minister at the time and the person who waited so long to tell everyone to go home, had left promptly at 3:00 p.m., and walked through the storm to Finch Avenue, where he caught a bus and went home. The next morning Benum arrived at the AES building bright and early and quite refreshed. He couldn't understand why all the employees already there were so dishevelled, sleepy and grouchy!"



A National Park on South Moresby

"South Moresby was one of the department's finest hours," says Elizabeth May of the Sierra Club of Canada, who recalls the negotiations to establish a national park on South Moresby Island in British Columbia. It happened in 1987, when she was a special assistant to Environment Minister Tom McMillan.

"It shows why you never give up," says May. "If you are prepared to be uncompromising you can get there." She shakes her head as she remembers that time. "You had to count on miracles," she says. "Given the option between a number of realistic choices shoot for the miracle."

The miracle is that provincial and federal governments would agree to establish a national park in a wilderness area where logging companies had leases to cut down the very trees that made South Moresby a national treasure.

Bruce Amos, Director of New Park Establishment for Parks Canada, describes South Moresby as "a serene and wild place, one of the richest biological and cultural areas in North America. The Haida name for the area, Gwaii Hannas, means 'islands of wonder and beauty'. Because of the diversity of its plants and animals, some of which are unique in the world, it has been called 'The Canadian Galapagos.'"

"A trainload of people went across Canada to demonstrate support for the park," Amos remembers. "This was an example of public pressure forcing governments to act."

Pat Thomson, who was negotiating on behalf of Parks Canada, says the negotiations were complex and long. "It was the first time that negotiations for a new national park involved the Prime Minister's Office on an almost continual basis." It took three months to work out a Memorandum of Understanding that was signed by Prime Minister Mulroney and Premier Vander Zalm. "It took another year to negotiate the details of the agreement, which was more than 100 pages."

It was also the most expensive national park up to that time, with a price tag of $106 million over eight years. The chief obstacle to agreement was the provincial government's insistence on extensive compensation. The final deal included compensation for workers who lost jobs, and the lumber companies for loss of access to commercial timber, as well as a regional economic development package.

A subsequent agreement was signed between Canada and the Council of the Haida Nation. The Haida, insisting their land claims had never been addressed, drove a hard bargain. It took two or three years to negotiate an agreement for co-management of the park. It took another year for legislation to pass through Parliament. Nine years after the Memorandum of Understanding, Gwaii Hannas is now cooperatively managed and operated as a national park reserve and a Haida Heritage Site.

Responding to National Environmental Emergencies

The crowded office on the 15th floor of Place Vincent Massey in Hull, Quebec, is officially called the National Environmental Emergency Centre (NEEC), but the people who work there can't shake off the name of the "buckets and boots brigade".

Heather Crépeault, Lise Tremblay and Luke Trip have kept track of environmental emergencies across Canada, and sometimes around the world. Their job is to keep the Minister and senior managers informed of environmental emergencies, to alert areas of Environment Canada or other departments who may be affected and to provide advice when needed.

NEEC began operations in 1972 under Commander Bob Beech, a former military officer. Recent manager Luke Trip came to Ottawa in 1988 from the Atlantic region to join the Hazardous Waste Management Division. In the region, Luke had gained valuable on-site advisory experience under the watchful eye of Roger Percy, Atlantic Region Emergency Response Coordinator.

Trip says, "Our role has always been to provide the best advice possible to those who are actually doing the clean-up. For example, when and how to use dispersants and how to avoid damage to sensitive ecosystems while cleaning up pollution."

Environment Canada's River Road research and development laboratory in Ottawa is recognized as a world leader in testing and analysis. In emergencies, trained staff can leave on short notice in specially equipped vehicles to do monitoring, and collect samples for analysis on-site or back in the lab.

A United Nations mission to deal with a Russian oil pipeline spill relied on information and equipment supplied by Merv Fingas and his associates at River Road to assess damage and determine the best mitigation measures. A team from Environment Canada, including Roger Percy, helped in the clean-up measures for the shores of the Persian Gulf in Kuwait after the Gulf war.

Five regional centres and district offices are the backbone of Environment Canada's emergency response advice network. Sometimes operating from the back of a station wagon, field response officers use electronic messaging to send information to and obtain advice from regional and national headquarters.

When there is a significant emergency, Environment Canada's regional coordinator forms a regional environmental emergency team (REET) made up of experts in many disciplines who can be consulted or brought together quickly to reach consensus on the advice to offer an on-site commander. "The person in charge on the scene still has to make the decisions based on many factors," says Trip, "but the REET process means there is one channel for environmental advice."

Almost all land-based incidents in Canada are under provincial jurisdiction but the provinces often ask Environment Canada for assistance. A pesticide fire in Nova Scotia, a train derailment in Manitoba, a tire fire in Ontario, and a fire at a PCB warehouse in Quebec are cases where the province has asked for help.

Environment Canada staff are provided with equipment that is appropriate to the incident. Somebody dealing with a toxic pesticide fire would need self-contained breathing apparatus. "And if you're at the scene of a major oil spill," says Trip, "yes, you do need those infamous buckets and boots, and some good disposable outerwear."

Every organization has an unsung hero. At the National Environmental Emergency Centre that's Heather Crépeault who came to Environment Canada in 1977, and worked for 3 1/2 years in the ADM's office. Heather started in the NEEC February 12, 1990, the day the Hagersville tire fire broke out.

Her administrative skills and knowledge of the department quickly came into play. Ontario region called to request $20,000 in funding, plus equipment and lab support. Heather contacted branch financial services to get confirmation that the money could be spent because these amounts are not in any budget.

"If there is an event of this nature we have to prepare a briefing note for the Minister's office," Heather says. "There might be questions in the House of Commons and the Minister has to have the most current information on the status of the incident, the possible effects and what is being done about it."

Budget reductions have cut the staff of the Centre from six people down to three. "When we need help, we call on other parts of the department, " says Luke Trip. Duty officers carry pagers so that they can be reached when the office is closed. Day or night, if there's an environmental emergency, Environment Canada's National Environmental Emergency Centre, the faithful "buckets and boots brigade" is ready to go to work.

Short Notes about Long-Time Employees

Jim Osborne, Head, Ocean Disposal & Shellfish in the Marine Environment Division, Hazardous Waste Branch, has seen the country from sea to sea. A graduate of Memorial University, he joined Resource Development, Pollution Unit, in Newfoundland in 1971, and later monitored the effects of oil and gas development in the Beaufort Sea. Memorable events include leading departmental intervention for the Hibernia environmental impact assessment. He's looking forward to his new role, representing EC on the scientific committee of the London Convention (1972).

Asha Chopra had never even seen a computer when she was hired by the Department of Forestry and Rural Development in 1967; but she had a Masters degree in Physics and an aptitude test showed she would be good at computer programming. Asha was in the Biometrics Research Service when Environment Canada began in June 1971. Now a project leader in Systems and Informatics Directorate, she says modern personal computers are almost as powerful as the huge IBM mainframes she first worked with.

Bill Prescott was working for the Province of New Brunswick when he accepted a position as biologist with the Canadian Wildlife Service in September 1971 to complete a wildlife survey on the Mackenzie pipeline corridor. Bill moved to Sackville, New Brunswick in 1974 as a parks biologist, "In Gros Morne National park," he says, "I saw caribou walking on snow banks, eating the tops of trees that were 25 feet tall."

The Fire at St-Basile-le-Grand

Claude Rivet, Environment Canada's regional coordinator for environmental emergencies in Quebec Region, and environmental engineer Francine Laperrière had just finished a training program about counter-measures for chemical spills when they landed at Dorval airport, Tuesday evening, August 23, 1988.

They were contacted by Guy Martin, emergency and senior investigations officer, and Vincent Martin, who had gone to the scene of a warehouse fire in St-Basile-le-Grand, southeast of Montreal.

Near midnight the same evening, Guy Martin reported that there had just been an explosion and a large ball of flame lit up the warehouse. A crew from Canadian Forces base St. Hubert used 25,000 litres of foam to bring the fire under control about 3:00 a.m. Guy Martin remembers the intense heat and the courage of all the firefighters who averted a major tragedy by putting out the fire so early.

The greatest threat was that PCB waste stored in the burning warehouse might release poisonous dioxans and furans

Firefighters are dwarfed by flames at St-Basile-le-Grand.

during the blaze. Residents near the warehouse had to be moved. Police carried out the evacuation, waking more than 3,000 people out of their beds. Most thought they would be back home in the morning. In fact, the evacuation lasted 18 days.

What took so long was the deadly nature of the menace and the slow process of analyzing samples. Testing for PCBs could be done within hours, but it initially took up to five days to get the results of tests for dioxans and furans. Moreover, the results had to be confirmed by testing a second series of samples.

At 5 o'clock on Wednesday morning, Merv Fingas, Alice Bobra and Derek Vandenberg from Ottawa's River Road Environmental Technology Centre arrived on the scene with a mobile laboratory. Within an hour they had set up a sample coordinating centre to collect, label and arrange for the analysis of samples of water, air, soil and surface coatings.

Francine Laperrière spent the next 14 days as Environment Canada's contact at the St-Basile City Hall operation centre. A plan for taking air, soil and water samples was drawn up based on the path of the fan of fumes and gas and the area evacuated. Five teams of two persons collected surface coating (or wipe) samples from horizontal metallic surfaces. The samples were sent to a laboratory in Montreal for analysis and duplicate samples were sent to the River Road lab in Ottawa.

Water samples from lakes and streams within the fallout zone and from five control stations within a five-kilometre radius of the fire were sent to the Canada Centre for Inland Waters at Burlington, Ontario. A TAGA 3000 team from the Ontario Ministry of the Environment worked for nine days testing the outside air and within schools and some houses for possible PCB concentrations.

While the fire was put out quickly, the danger remained until the warehouse site had been stabilized and until repeated sample analysis had confirmed that there was no measurable concentration of PCBs, dioxans or furans. After 14 days, Environment Canada had completed its work and presented the results to the municipal coordinator. Four days later the residents were allowed to return to their homes.

Twelve different federal and provincial government departments, the Canadian Forces, la Sûreté du Québec and regional police forces responded to the call for help from the Municipality of St-Basile.The total cost of the response was never calculated, but the bill for sample analysis alone was more than $500,000.

Claude Rivet, who was in charge of the Environment Canada team, says that 72 employees from Dartmouth to Vancouver helped get the job done at St-Basile-le-Grand. Francine Laperrière says she was proud that the department responded "as a professional team that worked very efficiently under pressure in an organized manner."

The Edmonton Tornado, July 31, 1987

The forecast issued by Environment Canada's Alberta Weather Centre in Edmonton at 5:00 a.m., July 31, 1987, announced, "Afternoon thunderstorms; heavy at times." At 11:00 a.m., the forecast was revised to, "Thunderstorms giving local heavy downpours and hail."

Garry Atchison was working his normal shift on the severe weather desk, analyzing current data and computer model outputs to identify potential severe weather conditions. Garry had been working for the weather service since 1964, when he graduated from Brandon College of the University of Manitoba with a Bachelor of Science degree.

Identifying a severe thunderstorm is a three-step process. The first step is to predict, usually while the sky is still clear, whether any thunderstorms will develop. When a storm starts, the second step is to assess if it is a severe storm. That usually is deduced from radar and satellite imagery.

At 2:45 p.m. on July 31, the Alberta Weather Centre issued a severe weather warning for Edmonton and surrounding counties. About an hour later, Brian O'Donnell and his family leaned forward to look out the window as their flight from Ottawa approached Edmonton where Brian was starting a new job as Regional Director, Atmospheric Environment Service. As the plane shook in turbulence Brian said to his wife, "That's a huge thunderstorm down there."

At 2:55 p.m., Tom Taylor, a pharmacist in Leduc, south of Edmonton, saw the tornado touch down. Tom knew enough to phone the weather office in Edmonton, to report what he had seen. Garry Atchison received Tom Taylor's phone call at 2:59 p.m. "He told me he had seen the tornado touch down and kick up a donut of dust and then retract back into the cloud." That was the third step, human confirmation of a tornado from the severe thunderstorm.

As he hung up the phone, Garry passed the news to his assistant. At 3:04 p.m. a tornado warning was broadcast on Environment Canada's Weatheradio network, a 24-hour very high frequency radio service that broadcasts voice messages to people and organizations who have purchased a Weatheradio receiver.

At 3:07 p.m., Garry Atchison typed out a tornado warning which was transmitted to the Canadian Press, Broadcast News and other subscribers to the weather service. A later investigation would find that of the approximately 20 media outlets who received the message, only four broadcast the warning immediately. Others waited until an hourly news broadcast to announce that a tornado warning had been issued by Environment Canada.

At 3:37 p.m., power went out in the weather centre. "We were able to call Winnipeg. I told the weather office there, 'We have lost power. Do what you can to monitor the storm and update the warnings.' Then the telephone was knocked out."

There are 15 to 20 tornadoes a year in Alberta. Most affect such a small rural area for such a short time that they are scarcely noticed. The Edmonton tornado of July 31, 1987, covered a strip about one kilometre at its widest and forty kilometres long, and it lasted for almost an hour. Yet 95 per cent of

Edmonton was not affected. Garry Atchison says, "We heard stories later about media people in West Edmonton who heard the tornado warning, looked out the window and didn't see anything. They supposed it was a false alarm."

In East Edmonton, the storm ripped apart buildings. At 3:55 p.m., the tornado tore through the Evergreen trailer park. In one hour of destruction, the tornado left 27 people dead and more than 300 injured, and caused more than $300 million in damage.

At 4:10 p.m., Brian O'Donnell and his family landed at Edmonton International Airport. As they left the plane, they heard someone say a tornado had passed near the airport. Brian recalls, "The days and weeks that followed were unlike any I had experienced."

There was an investigation, and the conclusion of the Chairman of the Review Team, Dr. Keith Hage, was that, "No earlier warnings could have been issued on the basis of the information and the technology available to the Alberta Weather Centre forecasters."

"A question that challenges me even today," says O'Donnell, "is the appropriate role for our programs in public awareness. Is it good enough to make our information and services accessible to the public or do we need to go further to ensure not only that the information is received but that it is understood?

"The Edmonton tornado experience taught me that when it comes to public health and safety our responsibilities extend, albeit in partnership, well into the awareness arena.

"Finally, I was struck by the incredible dedication of our staff who maintained a highly professional attitude, not only through the tornado itself, which passed within a few kilometres of the office, but also in the days of media attention that followed." Brian O'Donnell says, "We always expect the best of our staff. Sometimes they are called on to do the near-impossible."

Lynne Willoughby, Acting Chief of Human Resources Planning in Hull, began work in Pay and Benefits section of the Canadian Meteorological Service, Department of Transport, in November 1966 as a CR-1 in the Toronto office. In 1968, she began studies at York University. She graduated with a B.A. in Psychology in 1975. Lynne says, "Working in Personnel helped me to understand the real mandate of the department and to appreciate the professionalism of my fellow workers and the real strides that Environment Canada has made to enhance the quality of life for the citizens of Canada and for our neighbours around the world."

Bob Slater joined Environment Canada on November 1, 1971, as Chief, Mining and Metallurgical Division. "I started on the same day as Kim Shikaze, Bill Neff and Leo Buffa," Bob remembers. He has been Director, Ontario Region and Assistant Deputy Minister, Policy and now, Environmental Conservation Service. He says it's not coincidence that so many Environment Canada employees are still on the job after 25 years. "It's the nature of environmental issues that the time between defining a problem and achieving a solution can be a generation." On June 4, Bob Slater received the 1996 APEX Career Contribution Award.

The Stockholm Conference

"The Stockholm conference was a daring thing for governments to do at that time," says Dr. Fred Roots. "To think about the long-term effects of their actions on the environment and to do it together."

Environment Canada's science advisor emeritus is talking about the United Nations Conference on the Human Environment in Stockholm, Sweden, in June 1972. Representatives of 113 countries approved a Declaration of 26 principles of international behaviour and responsibility. The Conference adopted 109 recommendations for action, including the establishment of UNEP, the United Nations Environment Program, whose current Executive Director, Elizabeth Dowdeswell, was formerly ADM of the Atmospheric Environment Service of Environment Canada.

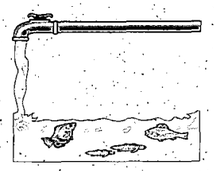
Prior to the Stockholm meeting, the Canadian government had organized about 20 public workshops across the country to obtain public opinion about what should be done about the environment. Gail Turner was a secretary in Liaison and Consultation. She recalls working weekends for months before the conference typing position papers and conclusions of the workshops.

At Stockholm, Dorothy Neale, Kathy Kowalchuk and Gail worked six days a week typing and doing clerical work with two secretaries from External Affairs. Gail remembers Stockholm as a beautiful, friendly city. "The restaurants had small flags of all the countries at the entrance," she says. "People coming to eat would pick up their country's flag and set it at their table."

Anthony Keith, retired Director of the National Wildlife Research Centre, remembers Robert Shaw, then Deputy Minister of Environment Canada, as "a dynamic leader who organized breakfast meetings of the Canadian delegation where everybody was given an assignment for the day."

Has the hope that was raised at Stockholm been fulfilled? Fred Roots pauses before answering. "If you look at the relationship between economy, development and the natural environment, the situation in most cases is worse than it was then; but the irony is that it probably would have been even worse, if we hadn't had the Stockholm conference.

"The overall environment is in pretty good shape, although global biological capacity and resilience is decreasing," he says, "but I'm not sure it's very good for humans. We are still trapped in the view that economic growth must continue and that the freedom of the individual is paramount. A continually growing population, dependent increasingly on energy-intensive technology, is probably the greatest threat to the biosphere."



Improving Water Quality

The introduction of national standards for water quality is one of the less-noticed but significant achievements of Environment Canada, according to Denis Davis, former Director General of the Inland Waters Directorate.

"When Environment Canada was formed," says Davis, "from Ontario west, 80 per cent of the urban population was served by sewage treatment. East of Ontario, in Quebec and the Atlantic provinces, only 20 per cent of the urban population was served by sewage treatment."

Davis says, "That has been significantly turned around by joint funding of sewage infrastructure through other federal or provincial government programs. Quebec, for example, has invested about $400 million a year for the last 15 years."

Denis Davis began his career with the Department of Energy, Mines and Resources in 1961 in Calgary, working on hydrometric surveys, measuring lake levels and river discharges. From that department he came to Environment Canada when it was formed in 1971.

He says the water sector brought to the new department a strong history of working closely with the provinces through the Boundary Waters Treaty and Canada Water Act programs.

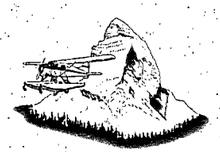
A good example is the flood damage reduction program. For years spring flooding had cost federal and provincial governments hundreds of millions of dollars in flood damage compensation payments.

The provincial governments paid the initial costs, but when damage exceeded more than $1 per capita within a province, the federal government became liable for an increasing share of the costs.

The flood damage reduction program identifies flood-prone areas so that development in those areas can be controlled. Almost 90 per cent of the flood-prone areas of Canada have been designated. The payoff has been a reduction in recurring annual payments for flood damage.

The clean-up of the Great Lakes is another water story that Denis Davis identifies as one of Environment Canada's successes.

Davis is sure water will always be important to Canadians; but he sees new challenges for the department. "Habitat loss and the introduction of exotic species – like the Zebra mussel – have become or will become more significant than pollution in the Great Lakes," he says. "There has been an insidious loss of habitat. Provinces and municipalities think of these as local issues. The federal government cannot provide direct protection but it can – and must – convince the public that habitat protection is important."



A Northern Tour

"We were approaching Mount Logan when one engine quit." Colin Wykes describes some of his experiences as guide for members of the House of Commons Standing Committee on Fisheries and Forestry who visited the western Arctic in June 1975.

Wykes started with the Department of Fisheries and Forestry in 1967 and moved to Yellowknife in 1973 from Halifax to become Environment Canada's district director in the Northwest Territories. "My colleague Bob Pettigrew and I organized six Parliamentary tours," he remembers.

The Honourable Jeanne Sauvé, Minister of the Environment and Len Marchand, her Parliamentary Secretary, led the 1975 tour that started from Edmonton. They travelled in a chartered airplane with four other members of the Standing Committee, including Joe Clark, the Conservative environment critic.

"The objectives were to allow MPs to view the region first-hand, gain an understanding of what was involved in many complex issues, and meet as many people as possible who were involved in government and industry in the north."

Deputy Minister Blair Seaborn, Assistant Deputy Minister Les Edgeworth and Branko Belovic, Director General, Information Services, were among Environment Canada staff who briefed and answered questions from the MPs and journalists.

The visitors began their tour at the Giant Yellowknife Mine, then flew to Norman Wells to inspect the new oil refinery. At Inuvik they boarded a huge S61N helicopter to see drilling rigs in the Beaufort Sea and the Kendall bird sanctuary.

Heading on to Dawson City, they saw the Herschel Island Arctic Wildlife Area and the recently-built pipeline at Prudhoe Bay, Alaska. After tours of an asbestos mine and a gold mine the visitors were on their way to Canada's highest mountain, Mount Logan in Kluane National Park, when the trouble began.

"I was in the cockpit, using the public address microphone to describe the scenery," Colin Wykes remembers, "when one of the pilots looked at the other. 'We're losing an engine,' he said, 'get back to your seat.' Then the pilot told everyone he was going to make a sharp turn and coast out of a narrow valley because he couldn't get any elevation. We flew back to Whitehorse on one engine."

The next day, with both engines again working, the visitors flew over Nahanni National Park, saw Virginia Falls and returned to Edmonton. "Just another northern inspection tour," says Colin Wykes. ""I spent nearly 13 years in the Yellowknife office. I have a lot of good memories." Wykes finished his Environment Canada career in Vancouver, where he retired in July 1995.

The Big Picture — From Weather to the Environment

Ian Rutherford says the creation of the Department of the Environment in 1971 gave research a big boost in the weather service. "Under Transport," he says, "the weather service was geared to forecasting for air traffic. Research on acid rain, climate change or the ozone layer was low on the Transport priority scale and was only given attention at all because of individuals such as Warren Godson."

Rutherford joined the meteorological branch of Transport in 1962, and earned a Masters degree in meteorology. His Master's thesis was about the ozone layer. In 1966 he took education leave to work on a Ph. D at McGill University in Montreal; then joined the numerical prediction research group in Dorval working as a research scientist.

The unit received the first of the department's new super-computers to do detailed analysis of world-wide weather and numeric simulation modelling of its evolution. He says, "The ability to actually solve the equations governing the weather has resulted in great improvements in forecasting." In September 1984, after 20 years as a scientist, Ian was put in charge of operations as Director General of Weather Services.

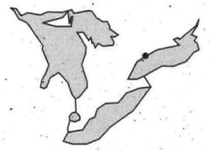
Changes in technology and budget reductions led to automation of some operations and the closing of many weather offices. The combined effects of new technology and a 35 per cent budget cut have reduced the number of weather offices to 17; but each of them has the capability of the old weather centres.

In 1988, Parks Canada had an opening for a DG of National Parks and Ian accepted a one-year assignment that turned into nearly four years with Parks.

Ian Rutherford says he felt he had come full circle when he became Director General of State of the Environment Reporting in 1992. "Back in the 1970s, in the weather service Warren Godson, Ted Munn and Joe Clodman were working to develop total prediction of the environment."

Today, he says the rest of the environment is in the position that climate was 25 years ago. "We now have complete models that can simulate climate. I predict that in less than a hundred years, we'll have the knowledge and the computers to simulate the total environment."

"The state of Canada's Environment is important to all of us," he insists. To promote wider use, the 1996 *State of the Environment Report* is being released chapter-by-chapter on the Internet. A printed report and a CD-ROM version will be available in the fall.



National Water Research Institute: Putting Knowledge to Work

The National Water Research Institute (NWRI) at Burlington, Ontario, is a good example of how Environment Canada scientists use knowledge to make our country better. NWRI is part of the Canada Centre for Inland Waters (CCIW), which began in 1967 in a trailer on the shore of Lake Ontario as part of the Department of Energy, Mines and Resources.

Today, the Centre is a complex of 12 buildings in which some 600 men and women from Environment Canada and Fisheries and Oceans Canada create knowledge and use their scientific expertise to give leadership in sustaining water resources for present and future generations of Canadians.

CCIW first gained international recognition from the pioneering research of Dr. Richard Vollenweider and colleagues into eutrophication, the accumulation of nutrients that support life in lakes. He identified phosphorus as the primary factor in lake production. Dr. Vollenweider developed predictive loading-response models that led to the restoration of Lake Erie, now one of the largest freshwater fisheries in the world, and which have been used to restore lakes in other countries.

In the 1980s the NWRI focused on toxic chemicals and their impact on Lake Ontario. Toxics were traced from Niagara Falls to the St. Lawrence estuary. In the early 1990s remedial techniques were developed and used to clean up contaminated sediments in local areas such as Hamilton Harbour, the Bay of Quinte, Collingwood Harbour, and Severn Sound.

NWRI and its scientists used computers to play a key role in the fight against acid rain. RAISON (Regional Analysis by Intelligent Systems using microcomputers), the Institute's decision-support system, was used to predict the effects of acid rain control measures on lakes in eastern Canada. RAISON simulations provided essential information during negotiations with the U.S. on reductions in sulphur dioxide emissions.

Since 1988, NWRI has led a research program into the ecological effect of bleached pulp mill effluent that has had a significant impact on regulations for the industry and the marketing of Canadian pulp and paper.

Pulp mill effluent can be harmful to fish. Some countries regulate pulp mill halogen (AOX) and Canadian mills faced a possible cost of more than a billion dollars because of proposals to require removal of chlorinated organic compounds from mill discharges in Canada. The university and government research group led by NWRI discovered in 1990 that the most widely observed aquatic effects of pulp mill effluent on fish are not related to levels of AOX and that removal of chlorinated organic compounds from mill discharges would not have solved the problem.

The results of that research changed plans for Canadian regulations and provided scientific knowledge for Canadian

NWRI employees explore the Great Lakes.

negotiators to prevent discrimination against Canadian pulp and paper products on the basis of AOX or chlorine dioxide use. Scientists are now working to identify the responsible contaminants in pulp mill effluent.

Polluted wastes and discharges, including chemicals are part of our society. The traditional clean-up method is to remove contaminated sediments and store them where they won't cause any harm. However, there is a danger the contaminants may spread as they are removed and safe storage must be found. If contaminants are in water, the risk of spreading is even greater.

Scientists at NWRI developed a technology for on-site treatment that uses a long, rake-like apparatus to inject chemical oxidants into contaminated aquatic sediments. The chemical process converts many contaminants , such as hydrogen sulphide from wood pulp, into compounds that are less damaging to the environment. The oxidants also stimulate natural bacteria to break down organic contaminants. The technique is more cost-effective than dredging techniques and is being marketed around the world through a Canadian company.

NWRI assesses sources of toxic chemicals entering the Great Lakes from the atmosphere, groundwater, agriculture and urban runoff, and studies the impacts of climate change, UV-B increases, and the role of estrogen-disrupting chemicals. NWRI researchers were the first in the world to find two extremely toxic pesticides - mirex and tributyltin (TBT) - in the environment, and to characterize their environmental distribution and fate. NWRI scientists work on joint projects with colleagues in many parts of the world, and the Institute continues to be the main collaborating centre for GEMS/Water, the United Nations global freshwater quality monitoring program in some 60 countries.

NWRI's mandate to clean up the environment includes putting its own house in order under an energy management agreement with Rose Technology Group. The lighting, air conditioning and lab air systems have been upgraded. Water conservation equipment, a garbage management system, and an electricity and heating cogeneration system have been installed at CCIW.

The greening of the complex will produce savings of almost $1 million per year. It will also reduce CO_2 emissions at CCIW by more than 40 per cent compared to the 1990 level, and save enough natural gas to heat 220 homes for a year.

The U.V. Index

In February 1992, NASA, the U.S. National Aeronautical and Space Administration, predicted a severe thinning of the ozone layer over North America in the coming spring. The NASA announcement led to concern over possible harmful health effects resulting from increased ultra-violet (UV) radiation associated with ozone depletion.

Within weeks, the Atmospheric Environment Service (AES) developed and launched two new programs: the Ozone Watch, to inform Canadians about the state of the ozone layer, and the UV Index, a measure of ultra-violet radiation.

Since the project had to be completed quickly, AES management assigned development of the program to four task force teams under coordinator Anne O'Toole, who is now Director of Environmental Services, Ontario Region.

"It was a very exciting and enjoyable project," says O'Toole. "It had been a long time since the service introduced a new predictive parameter." The short time frame was the biggest challenge but AES was able to respond very quickly, in part, because scientists in the weather service have done research into the chemical and physical nature of the stratospheric ozone layer for more than 30 years.

AES already had many of the required skills and facilities — observing systems, strong science, state-of-the-art computer and communications systems, forecast production and dissemination capabilities, and technical and professional staff with backgrounds in science. "We had contributions from every part of the organization," says O'Toole.

Health Canada, the Canadian Dermatology Association, the Canadian Cancer Society, the Canadian Ophthalmology Association, the Canadian Association of Optometrists and public health agencies were consulted and were essential partners. "The health community brought a very different perspective to the work that was very positive," says O'Toole.

The Ozone Watch, issued once a week, reports the average ozone thickness over 12 locations in Canada as a percentage of pre-1980 conditions. (before the effects of ozone-depleting chemicals took hold).

The UV Index is a measure of ultra-violet radiation, defined on a scale that generally runs from 0 to 10 in Canada. The Index helps individuals make healthy lifestyle choices. Heather Mackey, who led the group that prepared strategies for educating the public and media, says, "Most people are more careful about how long they stay in sunlight."

Proof of the international acceptance of Environment Canada's UV Index is not hard to find. "It was quite satisfying to step off a plane in Miami and see the UV Index in the local newspaper," says Anne O'Toole.

When Environment Canada Brought the Forest to the City

Jamie Hempel doesn't remember his role in the great Canadian National Exhibition of 1978. That's understandable; he was only two years old at the time.

Jamie's dad, Paul Hempel, was a communications officer helping to prepare the department's exhibit for the 100th anniversary of the annual fair in Toronto. With the help of a landscape architect, Environment Canada was going to bring the forest to the city.

Nearly 300 trees, shrubs, ground cover and seeds were brought to Toronto from the Petawawa Forest Experimental Station to create a woodland environment. Visitors walking a path through the trees could hear the sounds of the forest, including birds and running water. Changing lights represented the rising and setting of the sun and passing clouds.

The exhibit was surrounded by a canvas mural created by children of AES employees at Downsview, under the encouraging supervision of DOE graphic designer Lin Bing Wong. As a backdrop, 50-foot logs reached to the ceiling of the cavernous exhibition building. The exhibit was closed twice a day while the trees and shrubs were watered and blocks of ice were placed in front of fans. Visitors who arrived just after the watering remarked on the cool, moist air and the scent of the evergreens.

A stream in one corner of the exhibit was surrounded by tamarack and cedar, with a lichen and moss display in front of the stream. The fibreglass stream-bed sprang a leak and CNE staff spent several days in almost constant mopping until the leak was repaired.

Paul Hempel – now Director of Communications for EPS – remembers spending three days in Toronto prior to the Exhibition, interviewing student candidates for the eight positions of guides to the forest display and then taking them to be fitted with "safari suits". As visitors left the exhibit, a guide gave each person a green and white brochure with photo of a young hand planting a maple key. A brief message identified the maple as Canada's national tree, and stapled to the brochure was a small packet containing a single red maple seed.

The young hand in the photo belongs to Jamie Hempel. Paul describes bringing his son to work one morning and piling some earth on a table top so that photographer Kevin McVeigh could take a picture that demonstrated the tenderness required to manage our resources and to express the idea of the youth of Canada planting for the future.

Jamie, now 20 years old, is spending a pre-university year working and exploring the environment around Whistler, B.C.

From Montreal to Rio de Janiero: Working for a Healthier World

Maintaining a healthy environment is a matter of balancing rights and responsibilities, says Vic Buxton, Director of Environment Canada's Transboundary Air Issues Branch. "If I agree that you have a fundamental right to breathe clean air, I have a responsibility not to put out dirty air. If there is a dispute about the cleanliness of the air, there have to be standards and ways to measure the quality."

That's why the Montreal Protocol for Protection of the Ozone Layer is so important. It's all about the rights and responsibilities related to protecting the health of people, the environment and all living things for generations to come. In 1985, countries adopted the Vienna Convention to protect the ozone layer. "But," says Buxton, "the Vienna Convention was only a framework to co-operate. There was no agreement or controls to take action on the substances that were depleting the ozone layer."

The Montreal negotiations set specific objectives and timetables. Nations agreed that by the year 2000 they would reduce by 50 per cent the use of CFCs, which are used in refrigeration, cleaning solvents and the manufacture of foams and sprays.

The development of substitutes was important, but the key to eliminating CFCs was the availability of financial assistance to developing countries to ease their transition to the more environmentally appropriate substitutes. "This," he says, "will be the only solution to most other global environmental threats."

"Developing countries make up 80 per cent of the world's population. They didn't create the hole in the ozone layer," says Buxton. "We did. We are now asking them to replace a chemical or a process that we used for many years and which may play a critical role in their already vulnerable economies. If there is an incremental cost to these countries in making that change, we are morally obligated to pay the difference. We can't solve the problem or even make cost-effective use of our national expenditures without them."

The principle of compensation for incremental cost was first enshrined in the Montreal Protocol. "We established a fund of $510 million to help developing countries choose ozone-friendly substitutes and new technology. The replenishment of the fund is up for consideration in November 1996."

Three years after the signing of the Montreal Protocol, Vic Buxton was conscripted to organize Canada's participation and to lead, with External Affairs and CIDA, negotiations regarding the commitments countries might make at the Earth Summit — the United Nations Conference on Environment and Development (UNCED) at Rio de Janiero, Brazil, in June 1992.

More than 110 heads of government attended the Earth Summit and joined in the Rio Declaration of Principles for protecting the environment. The mandate they endorsed and which Vic Buxton played a lead role in negotiating is called *Agenda 21*, the sustainable development blueprint for the 21st century.

Buxton says UNCED marked a real shift in the way people think. He is optimistic because he believes there is a widespread awareness that we are damaging the environment and we have a moral responsibility to stop the damage. "We used to think that our ecological resources were infinite," he says, "we know now that they are not."

Buxton, who joined Environment Canada in 1971 after working in environmental protection with the Province of Ontario, says, "This department started in an era when we were trying to avoid pollution havens and establish some standards of common decency in terms of pollution.

His 25 years of personal engagement in international negotiations have convinced Buxton that we have to live in harmony with our neighbours, whether that neighbour is the family next door or the next country. "Our environment will never be safe unless everyone's environment is safe," he says. "Canada has a unique opportunity to lead, because unlike some others we are not seen as a superpower serving only our economic self-interest. We have a reputation for leadership built on concepts of fairness and equity. That leadership must come from and be sustained at the national level."

Celebrating the Montreal Protocol for Protection of the Ozone Layer, September 1987.

Is Sackville the Nicest Place to Work?

If there were a competition to choose the nicest Environment Canada office in which to work, the Atlantic Region headquarters of the Canadian Wildlife Service at Sackville, New Brunswick, would surely rank high on the list.

It's not just the building that makes the Sackville office so attractive, it's the location. The Cape Cod style cedar shingle building is located a few blocks from the centre of town on the edge of the Sackville Waterfowl Park. The staff moved there in June 1994 from a former service station next to the Post Office on Main Street.

The Sackville Waterfowl Park was developed by the Town of Sackville in cooperation with Ducks Unlimited Canada. The park covers 55 acres that were previously pasture and abandoned agricultural land.

Al Smith, Head of Regional Habitat, Atlantic Region, describes it as "a restored wetland, a former salt marsh that was drained for most of the past 300 years." It was flooded in April 1988 and is connected by more than three kilometres of trails and boardwalk.

The Canadian Wildlife Service has been an active partner in development of the Park. A wetlands display in the regional office introduces visitors to the area and leads onto a large wooden deck overlooking the Waterfowl Park.

Smith says the Sackville Waterfowl Park has quickly become one of the best places to view aquatic birdlife in Eastern Canada. Nearly 170 species of birds have been recorded in the park. "The best time is in late July or August when the young are on the water. We also get a lot of visiting shorebirds in August."

Al Smith grew up in Sackville and earned a B.Sc. degree at Mount Allison University before joining CWS in 1967. "Bill Prescott, who is CWS Regional Manager of Wildlife Conservation, and I both went to Mount Allison," he says, "and we both did a Masters at Acadia University."

Many CWS staff spend a lot of time doing field work but when they have to sit down at a desk, the regional office in Sackville is a very pleasant place to work. Sackville is two hours north of Halifax and 30 minutes south of Moncton, and with the University in the town, Al Smith says, "It's a fantastic place to bring up a family."

The Unsung Heroes of the Weather Service

"I'm not saying the weather forecasters won the war, but they certainly played an important role!" Gilles Clermont gets a bit excited when he describes the role of the Canadian Forces Weather Service (CFWS).

Of the more than 140 employees of CFWS who were transferred to Environment Canada 25 years ago, 18 are still on the job. From Halifax, Nova Scotia to Comox, British Columbia, they provide specialized weather services to Canada's armed forces.

The Canadian military has received essential weather information for almost 80 years but there was no permanent weather staff in the forces until just prior to World War II. The first meteorologist (forecaster) and meteorological assistant (observer) were assigned by the Department of Transport, which administered the weather service, to the Royal Canadian Air Force station in Vancouver in the summer of 1939.

When war was declared, Canada agreed to provide weather service on the east coast to the Royal Navy, which was escorting convoys of ships across the Atlantic to Britain. Between 1939 and 1945, the Department of Transport established 17 forecast centres and 58 weather offices at air training schools and military bases across Canada. At the end of the war, two-thirds of the staff were no longer required and service was cut back.

The post-war space program brought new technology to the military and its weather forecasters. The first satellite weather images were received aboard HMCS *Bonaventure* in 1968. Computers followed soon after.

The new Department of the Environment took over the Canadian Forces Weather Service in June 1971. Management of CFWS personnel was assigned to the Department of National Defence in 1975, but Environment Canada continues to provide technical support.

In 1977 the CFWS network extended to 22 locations across Canada and included such specialized areas as oceanographic centres, ballistic meteorological sections and upper air sections. There were also briefers, forecasters and observers on 24 ships at sea.

In 1996 the Canadian Forces Weather Service marks 57 years of professional service to the Canadian Forces. The remaining 18 people who were transferred to the new department in June 1971 congratulate Environment Canada on our 25th anniversary.

Best wishes from Byron Brodie, Gilles Clermont, Richard Cooper, Terry Danks, Jim Hamilton, Michael Hawkes, Robert Higgs, Blaine Jelley, John Patrick Kelly, Frank Kerkhoff, Ted Koolwine, Wayne Lumsden, Andy O'Doherty, Bill Pugsley, Lou Ranahan, David Smith, Barry Stenton and Jim Yip.

Environment Canada Pioneers

Employees who have worked for Environment Canada since it was established in 1971, marking 25 years of achievement!

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K.H. Barker • Ken Banks • Dick Boak • Brian Bowkett • Duane Brothers • Lynne Campo • Cecilia Chang • Terry Chiasson • K.J. Clarke • Lyle Connatty • Gary Dick • Steve Doss • Wally Edwards • David Ellis • Larry Funk • Darcy Goyette • Colin Gray • Brian Hammond • Will Hayward • Keith Hebron • Fred Herfst • William Hill • Mert Horita • Brian Jensen • Susan Jonvik • Gary Kaiser • Al Keating • Brian Kelso • Simon Klaudt • Robin Lines • Dick Lopaschuk • Ian Lougheed • Bob Loveless • John Lozanski • Mike Mazalek • Pat Morin • Jamie MacDuff • Fred Mah • Bob McArter • Roger McAully • R on McLaren • Dan Morrison • John Mullock • Ron Nordmann • Al Nourse • Hal Nelson • Irv Neufeld • Ron Nutton • Dave Phillips • Rob Pigott • Steve Pond • Mike Purves • David Robinson • Paul Robertson • John Spagnol • Bud Skinner • Eric Taylor • Brent Tipple • John Thomas • Bruce Thomson • Gord Thompson • Dietmar Uberschar • Bill Walker • Dave Walker • Dave Watson • Ron Watts • Gary Wells • Al Whitman • Pamela Whitehead • Ken Wile • Stu Wood • Mike Woodroff • Barry Zollen

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Canadian Forces Weather Service

Byron Brodie • Gilles Clermont • Richard Cooper • Terry Danks • Jim Hamilton • Michael Hawkes • Robert Higgs • Blaine Jelley • John Patrick Kelly • Frank Kerkhoff • Ted Koolwine • Wayne Lumsden • Andy O'Doherty • Bill Pugsley • Lou Ranahan • David Smith • Barry Stenton • Jim Yip

National Water Research Institute

H. Alkema • K.D. Austen • J. Barica • G.S. Beal • L.E. Benner • C. Bil • J.W. Byron • Y.K. Chau • F. Chiocchio • J.P. Coakley • H.E. Comba • M. Comba • F.H. Don • A.M. Donelan • J.E. Dowell • B.J. Dutka • P. Engel • D.P. Fekyt • M.E. Fox • P.F. Hamblin • P.M. Healey • J.D. Heidt • A.A. Jurkovic • Y.L. Lau • J. Lechner • G.G. Leppard • D.L.S. Liu • P.G. Manning • J. Marsalek • D.W.S. Marsh • M.R. Mawhinney • T. Mayer • K.C. Miners • B.H. Moore • A. Mudroch • H.Y.F. NG G.M. Paquette • M. Pedrosa • H.C. Pulley • C. Rajasekaramurthy • F. Rosa • J.F. Ryan • H.A. Savile • B.F. Scott • Y.M. Sheikh • S.B. Smith W.M.J. Strachan • W.B. Taylor • K.A. Terry • J.A. Tyler • R.J. Wilkins

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Atlantic Region

Bill Brimley • Bill Horne • Joe Kozak • Liz Langley • Fred Lindeijer • John Mader • Sean Malone • Anne Morton • Al Smith

Above: *Dr. Leslie Whitby opens Green Plan Consultations meeting.*

Left: *AES employee, Brian Bukoski, going to air pollution monitoring site at Alert Weather Station, NWT.*

Below: *Environment Minister Jeanne Sauvé leads members of the Standing Committee on a Northern tour in June 1975.*

1. DON HOSKINS
2. MAX WOPNFORD
3. BURK RITCHIE
4. BLAIR SEABORN
5. LEN MARCHAND
6. BOB STEWART
7. BOB MCLARN
8. WAYNE CHEVELDAYOFF
9. LES EDGEWORTH
10. MARCEL PEPIN
11. HUGH ANDERSON
12. JACK EATOCK
13. STU LEGGAT
14. JOE CLARKE
15. ROLLY HORSEFIELD
16. JOHN HNATIUK
17. HON. JEANNE SAUVE
18. ANDY FULTON
19. PIERRE NADEAU
20. ADRIEN LAMBERT
21. COLIN WYKES
22. DENNIS SURRENDI